



**ASLANOV'S  
LESSONS**

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# **IELTS READING QUESTION-TYPE BASED TESTS**

- 1. TRUE FALSE NOT GIVEN**
- 2. MATCHING HEADINGS**
- 3. MATCHING SENTENCE ENDINGS**
- 4. MULTIPLE CHOICE QUESTIONS**
- 5. MATCHING NAMES**
- 6. SUMMARY COMPLETION**
- 7. SHORT-ANSWER QUESTIONS**
- 8. MATCHING INFORMATION**
- 9. TABLE COMPLETION**
- 10. LIST SELECTION**

**GET PREPARED  
FOR YOUR REAL  
EXAM WITH THIS  
MANUAL**

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**IELTS READING  
PRACTICE TESTS:**

**10 TYPES OF  
TESTS**

**+ ANSWER KEY**

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# TRUE / FALSE / NOT GIVEN

Mini warm-up practice tests – Choose either *True* or *False*

<b>Passage:</b> As a roller coaster puts the body through weightlessness, high gravitational forces and acceleration, the brain struggles to make sense of conflicting and changing signals from the senses.	<b>Question:</b> The brain has difficulty understanding the messages sent from the senses during rollercoaster rides.
<b>Passage:</b> This product causes the break-down of excess body fat and will help people shed pounds.	<b>Question:</b> This product helps people lose weight by eliminating extra fat in the body.
<b>Passage:</b> Symptoms of the flu include fever and nasal congestion.	<b>Question:</b> Stuffiness and elevated temperature are signs of the flu.
<b>Passage:</b> The tornado razed the town.	<b>Question:</b> The town was obliterated by the cyclone.
<b>Passage:</b> The gray clouds were a warning of an approaching storm.	<b>Question:</b> The coming storm was foretold by the dark clouds.
<b>Passage:</b> The still waters of the Caribbean were teal in color.	<b>Question:</b> The turquoise Caribbean waters were calm.
<b>Passage:</b> It was a spacious room with lit candles all over.	<b>Question:</b> Candles flickered from many areas of the large room.
<b>Passage:</b> At one level, it should come as no surprise that our state of mind can influence our physiology; anger opens the superficial blood vessels of the face: sadness pumps the tear glands.	<b>Question:</b> We know that emotions sometimes have direct physical effects on the body.
<b>Passage:</b> The museum has a huge collection of African art.	<b>Question:</b> There is a large exhibit of African art at the museum.
<b>Passage:</b> Habitation in outer space in huge stations is no longer just a dream, but a reality; the development of space hotels is not far-off.	<b>Question:</b> The concept of the habitation of outer space by mankind is unimaginable.
<b>Passage:</b> Australians believe that life should have a balance between work and leisure time. As a consequence, some students may be critical of others who they perceive as doing nothing but study.	<b>Question:</b> Students who study all the time may receive positive comments from their colleagues.
<b>Passage:</b> The free, accessible nature of free-running means it has the potential to engage groups of young people who are typically unmoved by traditional sports. Basically anyone can practise, anywhere-all you need is a decent pair of trainers, so the financial outlay is negligible. There are no joining fees, no forms to fill in and no rules and regulations.	<b>Question:</b> Free-running is an expensive activity for participants.

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<p><b>Passage:</b> In the security industry today, there are two clear divisions and one of these is decidedly more glamorous than the other. The glamorous part deals with digital security, which includes everything from fighting computer viruses and tackling malicious computer hackers to controlling which employees have access to which systems. All of this has overshadowed the less glamorous side of the industry, which deals with physical security - in essence, door locks, alarms and that sort of thing.</p>	<p><b>Question:</b> Designing ways to protect computers from hackers represents the boring side of the security industry.</p>
<p><b>Passage:</b> While reading a certain amount of writing is as crucial as it has ever been in industrial societies, it is doubtful whether a fully extended grasp of either is as necessary as it was 30 or 40 years ago.</p>	<p><b>Question:</b> Our literacy skills need to be as highly developed as they were in the past.</p>
<p><b>Passage:</b> The laboratory studies similarly show less mental stimulation, as measured by brain-wave production, during viewing than during reading.</p>	<p><b>Question:</b> People's brains show less activity while watching television than when reading.</p>
<p><b>Passage:</b> Australian notions of privacy mean that areas such as financial matters, appearance and relationships are only discussed with close friends. While people may volunteer such information, they may resent someone actually asking them unless the friendship is firmly established. Even then, it is considered very impolite to ask someone what they earn. With older people, it is also rude.</p>	<p><b>Question:</b> It is acceptable to discuss financial issues with people you do not know well.</p>
<p><b>Passage:</b> But most modern humour theorists have settled on some version of Aristotle's belief that jokes are based on a reaction to or resolution of incongruity, when the punchline is either a nonsense or, though appearing silly, has a clever second meaning.</p>	<p><b>Question:</b> Current thinking on humour has largely ignored Aristotle's view on the subject.</p>
<p><b>Passage:</b> Physical exercise helps control insulin levels, while ingesting fat combined with sugars and starches can cause surges in insulin levels.</p>	<p><b>Question:</b> Insulin levels rise sharply when foods with high levels of starch, sugar and fat are eaten.</p>
<p><b>Passage:</b> But since 1980, the amount of water consumed per person has actually decreased, thanks to a range of new technologies that help to conserve water in homes and industry.</p>	<p><b>Question:</b> Modern technologies have led to a reduction in domestic water consumption.</p>

**Andrea Palladio: Italian architect**

## TEST 1 - Andrea Palladio: Italian architect

*A new exhibition celebrates Palladio's architecture 500 years on*

**A.** Vicenza is a pleasant, prosperous city in the Veneto, 60km west of Venice. Its grand families settled and farmed the area from the 16th century. But its principal claim to fame is Andrea Palladio, who is such an influential architect that a neoclassical style is known as Palladian. The city is a permanent exhibition of some of his finest buildings, and as he was born— in Padua, to be precise—500 years ago, the International Centre for the Study of Palladio's Architecture has an excellent excuse for mounting *lagrande mostra*, the big show.

**B.** The exhibition has the special advantage of being held in one of Palladio's buildings, Palazzo Barbaran da Porto. Its bold facade is a mixture of rustication and decoration set between two rows of elegant columns. On the second floor the pediments are alternately curved or pointed, a Palladian trademark. The harmonious proportions of the atrium at the entrance lead through to a dramatic interior of fine fireplaces and painted ceilings. Palladio's design is simple, clear and not over-crowded. The show has been organised on the same principles, according to Howard Burns, the architectural historian who co-curated it.

**C.** Palladio's father was a miller who settled in did a humble miller's son become a world renowned architect? The answer in the exhibition is that, as a young man, Palladio excelled at carving decorative stonework on columns, doorways and fireplaces. He was plainly intelligent, and lucky enough to come across a rich patron, Gian Giorgio Trissino, a landowner and scholar, who organised his education, taking him to Rome in the 1540s, where he studied the masterpieces of classical Roman and Greek architecture and the work of other influential architects of the time, such as Donato Bramante and Raphael.

**D.** Burns argues that social mobility was also important. Entrepreneurs, prosperous from agriculture in the Veneto, commissioned the promising local architect to design their country villas and their urban mansions. In Venice the aristocracy were anxious to co-opt talented artists, and Palladio was given the chance to design the buildings that have made him famous— the churches of San Giorgio Maggiore and the Redentore, both easy to admire because they can be seen from the city's historical centre across a stretch of water.

**E.** He tried his hand at bridges—his unbuilt version of the Rialto Bridge was decorated with the large pediment and columns of a temple —and, after a fire at the Ducal Palace, he offered an alternative design which bears an uncanny resemblance to the Banqueting House in Whitehall in London. Since it was designed by Inigo Jones, Palladio's first foreign disciple, this is not as surprising as it sounds.

**F.** Jones, who visited Italy in 1614, bought a trunk full of the master's architectural drawings; they passed through the hands of the Dukes of Burlington and Devonshire before settling at the Royal Institute of British Architects in 1894. Many are now on display at Palazzo Barbaran. What they show is how Palladio drew on the buildings of ancient Rome as models. The major theme of both his rural and urban building was temple architecture, with a strong pointed pediment supported by columns and approached by wide steps.

**G.** Palladio's work for rich landowners alienates unreconstructed critics on the Italian left, but among the papers in the show are designs for cheap housing in Venice. In the wider world, Palladio's reputation has been nurtured by a text he wrote and illustrated, "Quattro Libri dell' Architettura". His influence spread to St Petersburg and to Charlottesville in Virginia, where Thomas Jefferson commissioned a Palladian villa he called Monticello.

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**H.** Vicenza's show contains detailed models of the major buildings and is leavened by portraits of Palladio's teachers and clients by Titian, Veronese and Tintoretto; the paintings of his Venetian buildings are all by Canaletto, no less. This is an uncompromising exhibition; many of the drawings are small and faint, and there are no sideshows for children, but the impact of harmonious lines and satisfying proportions is to impart in a viewer a feeling of benevolent calm. Palladio is history's most therapeutic architect.

**I.** "Palladio, 500 Anni: La Grande Mostra" is at Palazzo Barbaran da Porto, Vicenza, until January 6th 2009. The exhibition continues at the Royal Academy of Arts, London, from January 31st to April 13th, and travels afterwards to Barcelona and Madrid.

### *Questions 1-7*

*Do the following statements agree with the information given in Reading Passage?*

*True if the statement agrees with the information*

*False if the statement contradicts the information*

*NOT GIVEN If there is no information on this*

- Q1.** The building where the exhibition is staged has been newly renovated
- Q2.** Palazzo Barbaran da Porto typically represents the Palladio's design
- Q3.** Palladio's father worked as an architect.
- Q4.** Palladio's family refused to pay for his architectural studies.
- Q5.** Palladio's alternative design for the Ducal Palace in Venice was based on an English building.
- Q6.** Palladio designed both wealthy and poor people
- Q7.** The exhibition includes paintings of people by famous artists



## **TEST 2 - New Agriculture in Oregon, US**

**A.** Onion growers in eastern Oregon are adopting a system that saves water and keeps topsoil in place, while producing the highest quality "super colossal" onions. Pear growers in southern Oregon have reduced their use of some of the most toxic pesticides by up to two-thirds, and are still producing top-quality pears. Range managers throughout the state have controlled the poisonous weed tansy ragwort with insect predators and saved the Oregon livestock industry up to \$4.8 million a year.

**B.** These are some of the results Oregon growers have achieved in collaboration with Oregon State University (OSU) researchers as they test new farming methods including integrated pest management (IPM). Nationwide, however, IFM has not delivered results comparable to those in Oregon. A recent U.S General Accounting Office (GAO) report indicates that while integrated pest management can result in dramatically reduced pesticide use, the federal government has been lacking in effectively promoting that goal and implementing IPM. Farmers also blame the government for not making the new options of pest management attractive. "Wholesale changes in the way that farmers control the pests on their farms is an expensive business." Tony Brown, of the National Farmers Association says. "If the farmers are given tax breaks to offset the expenditure, then they would willingly accept the new practices." The report goes on to note that even though the use of the riskiest pesticides has declined nationwide, they still make up more than 40 percent of all pesticides used today; and national pesticide use has risen by 40 million kilograms since 1992. "Our food supply remains the safest and highest quality on Earth but we continue to overdose our farmland with powerful and toxic pesticides and to under-use the safe and effective alternatives," charged Patrick Leahy, who commissioned the report. Green action groups disagree about the safety issue. "There is no way that habitual consumption of foodstuffs grown using toxic chemicals of the nature found on today's farms can be healthy for consumers," noted Bill Bowler, spokesman for Green Action, one of many lobbyists interested in this issue.

**C.** The GAO report singles out Oregon's apple and pear producers who have used the new IPM techniques with growing success. Although Oregon is clearly ahead of the nation, scientists at OSU are taking the Government Accounting Office criticisms seriously. "We must continue to develop effective alternative practices that will reduce environmental hazards and produce high quality products," said Paul Jepson, a professor of entomology at OSU and new director.

**D.** OSU's Integrated Plant Protection Centre (IPPC). The IPPC brings together scientists from OSU's Agricultural Experiment Station, OSU Extension service, the U.S. Department of Agriculture and Oregon farmers to help develop agricultural systems that will save water and soil, and reduce pesticides. In response to the GAO report, the Centre is putting even more emphasis on integrating research and farming practices to improve Oregon agriculture environmentally and economically.

**E.** "The GAO report criticizes agencies for not clearly communicating the goals of IPM," said Jepson. "Our challenge is to greatly improve the communication to and from growers, to learn what works and what doesn't. The work coming from OSU researchers must be adopted in the field and not simply languish in scientific journals."

**F.** In Oregon, growers and scientists are working together to instigate new practices. For example, a few years ago scientists at OSU's Malheur Experiment Station began testing a new drip irrigation system to replace old ditches that wasted water and washed soil and fertilizer into streams. The new system cut water and fertilizer use by half, kept topsoil in place and protected water quality.

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**G.** In addition, the new system produced crops of very large onions, rated "super colossal" and highly valued by the restaurant industry and food processors. Art Pimms, one of the researchers at Malheur comments: "Growers are finding that when they adopt more environmentally benign practices, they can have excellent results. The new practices benefit the environment and give the growers their success."

**H.** OSU researchers in Malheur next tested straw mulch and found that it successfully held soil in place and kept the ground moist with less irrigation. In addition, and unexpectedly, the scientists found that the mulched soil created a home for beneficial beetles and spiders that prey on onion trips - a notorious pest in commercial onion fields - a discovery that could reduce the need for pesticides. "I would never have believed that we could replace the artificial pest controls that we had before and still keep our good results," commented Steve Black, a commercial onion farmer in Oregon, "but instead we have actually surpassed expectations."

**I.** OSU researchers throughout the state have been working to reduce dependence on broad spectrum chemical sprays that are toxic to many kind of organisms, including humans. "Consumers are rightly putting more and more pressure on the industry to change its reliance on chemical pesticides, but they still want a picture-perfect product," said Rick Hilton, entomologist at OSU's Southern Oregon Research and Extension Centre, where researchers help pear growers reduce the need for highly toxic pesticides. Picture perfect pears are an important product in Oregon and traditionally they have required lots of chemicals. In recent years, the industry has faced stiff competition from overseas producers, so any new methods that growers adopt must make sense economically as well as environmentally. Hilton is testing a growth regulator that interferes with the molting of codling moth larvae. Another study used pheromone dispensers to disrupt codling moth mating. These and other methods of integrated pest management have allowed pear growers to reduce their use of organophosphates by two-thirds and reduce all other synthetic pesticides by even more and still produce top-quality pears. These and other studies around the state are part of the effort of the IPPC to find alternative farming practices that benefit both the economy and the environment.

### *Questions 1-5*

*Do the following statements agree with the information given in Reading Passage?*

*True if the statement agrees with the information*

*False if the statement contradicts the information*

*NOT GIVEN If there is no information on this*

- Q1.** Integrated Pest Management has generally been regarded as a success in the across the US.
- Q2.** Oregon farmers of apples and pears have been promoted as successful examples of Integrated Pest Management.
- Q3.** The IPPC uses scientists from different organisations globally
- Q4.** Shaw mulch experiments produced unplanned benefits.
- Q5.** The apple industry is now facing a lot of competition from abroad.

## TEST 3 - Terminated Dinosaur Era

**A.** The age of dinosaurs, which ended with the cataclysmic bang of a meteor impact 65 million years ago, may also have begun with one. Researchers found recently the first direct, though tentative, geological evidence of a meteor impact 200 million years ago, coinciding with a mass extinction that eliminated half of the major groups of life and opened the evolutionary door for what was then a relatively small group of animals: dinosaurs.

**B.** The cause and timing of the ascent of dinosaurs has have been much debated. It has been impossible to draw any specific conclusions because the transition between the origin of dinosaurs and their ascent to dominance has not been sampled in detail. "There is a geochemical signature of something important happening, probably an asteroid impact, just before the time in which familiar dinosaur-dominated communities appear," said Dr. Paul E. Olsen, a professor of earth and environmental sciences at Columbia University's Lamont-Doherty Earth Observatory in Palisades, N.Y.

**C.** Olsen and his colleagues studied vertebrate fossils from 80 sites in four different ancient rift basins, part of a chain of rifts that formed as North America began to split apart from the supercontinent that existed 230-190 million years ago. In the layer of rock corresponding to the extinction, the scientists found elevated amounts of the rare element iridium. A precious metal belonging to the platinum group of elements, iridium is more abundant in meteorites than in rocks.

**D.** On Earth, a similar spike of iridium in 65 million-year-old rocks gave rise in the 1970s to the theory that a meteor caused the demise of the dinosaurs. That theory remained controversial for years until it was corroborated by other evidence and the impact site was found off the Yucatan Peninsula. Scientists will need to examine the new iridium anomaly similarly. The levels are only about one-tenth as high as those found at the later extinction. That could mean that the meteor was smaller or contained less iridium or that a meteor was not involved—iridium can also come from the Earth's interior, belched out by volcanic eruptions. Dr. Michael J. Benton, a professor of vertebrate paleontology at the University of Bristol in England, described the data as "the first reasonably convincing evidence of an iridium spike".

**E.** The scientists found more evidence of rapid extinction in a database of 10,000 fossilized footprints in former lake basins from Virginia to Nova Scotia. Although individual species cannot usually be identified solely from their footprints — the tracks of a house cat, for example, resemble those of a baby tiger — footprints are much more plentiful than fossil bones and can provide a more complete picture of the types of animals walking around. "It makes it very easy for us to tell the very obvious signals of massive fauna change," Dr. Olsen said. Because the sediment piles up quickly in lake basins, the researchers were able to assign a date to each footprint, based on the layer of rock where it was found. They determined that the mix of animals walking across what is now the East Coast of North America changed suddenly about 200 million years ago.

**F.** The tracks of several major reptile groups continue almost up to the layer of rock marking the end of the Triassic geologic period 202 million years ago, and then vanish in younger layers from the Jurassic period. "I think the footprint methodology is very novel and very exciting," said Dr. Peter D. Ward, a professor of geology at the University of Washington. He called the data "very required more research. Last year, researchers led by Dr. Ward reported that the types of carbon in rock changed abruptly at this time, indicating a sudden dying off of plants over less than 50,000 years. The footprint research reinforces the hypothesis that the extinction was sudden.



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**G.** Several groups of dinosaurs survived that extinction, and the footprints show that new groups emerged soon afterward. Before the extinction, about one-fifth of the footprints were left by dinosaurs; after the extinction, more than half were from dinosaurs. The changes, the researchers said, occurred within 30,000 years geological blink of an eye. The scientists postulate that the asteroid or comet impact and the resulting death of Triassic competitors allowed a few groups of carnivorous dinosaurs to evolve in size very quickly and dominate the top of the terrestrial food chain globally.

**H.** Among the creatures that disappeared in the extinction were the dominant predators at the time: 15-foot-long rauisuchians with great knife-like teeth and phytosaurs that resembled large crocodiles. Dinosaurs first evolved about 230 million years ago, but they were small, competing in a crowded ecological niche. Before the extinction 200 million years ago. the largest of the meat-eating dinosaurs were about the size of large dogs. Not terribly impressive." Dr. Olsen said. The dinosaurs quickly grew. The toe-to-heel length of the foot of a meat eater from the Jurassic period was on average 20 percent longer than its Triassic ancestor. Larger feet can carry bigger bodies; the scientists infer the dinosaurs doubled in weight, eventually evolving into fearsome velociraptors, Tyrannosaurus rex and other large carnivorous dinosaurs.

**I.** The spurt in evolution is similar to the rise of mammals after the extinction of dinosaurs. Mammals, no larger than small dogs during the age of dinosaurs, diversified into tigers, elephants, whales and people after the reptilian competition died away. The success of the dinosaurs after the Triassic-Jurassic extinction may be why they did not survive the second extinction. "Small animals always do better in catastrophic situations. Dr. Olsen said, because they can survive on smaller amounts of food." He also pointed out that scientists now believe the small dinosaurs did survive. "We just call them birds," he said.

### *Questions 1-7*

*Do the following statements agree with the information given in Reading Passage?*

*True if the statement agrees with the information*

*False if the statement contradicts the information*

*NOT GIVEN If there is no information on this*

**Q1.** The rare element, iridium, was presented both on earth and in meteorites.

**Q2.** The meteor impact theory had been suspected before the discovery of the impact site and other supporting evidence.

**Q3.** Footprints are of little value in providing information, in comparison to fossil bones, because individual species cannot be identified with footprints.

**Q4.** According to scientists, the transition to a dinosaur-dominated era took place very quickly by geological time scales.

**Q5.** The creatures that disappeared in the extinction were the dominantly the 15-foot-long rauisuchians and large crocodiles.

**Q6.** Tyrannosaurus rex was larger in body size than other carnivorous dinosaurs.

**Q7.** Large dinosaurs died out but small ones evolved and competed with birds and mammals.

## TEST 4 - The Dinosaurs Footprints and Extinction

**A.** EVERYBODY knows that the dinosaurs were killed by an asteroid. Something big hit the earth 65 million years ago and, when the dust had fallen, so had the great reptiles. There is thus a nice, if ironic, symmetry in the idea that a similar impact brought about the dinosaurs' rise. That is the thesis proposed by Paul Olsen, of Columbia University, and his colleagues in this week's Science.

**B.** Dinosaurs first appear in the fossil record 230m years ago, during the Triassic period. But they were mostly small, and they shared the earth with lots of other sorts of reptile. It was in the subsequent Jurassic, which began 202million years ago, that they overran the planet and turned into the monsters depicted in the book and movie "Jurassic Park". (Actually, though, the dinosaurs that appeared on screen were from the still more recent Cretaceous period.) Dr Olsen and his colleagues are not the first to suggest that the dinosaurs inherited the earth as the result of an asteroid strike. But they are the first to show that the takeover did, indeed, happen in a geological eyeblink.

**C.** Dinosaur skeletons are rare. Dinosaur footprints are, however, surprisingly abundant. And the sizes of the prints are as good an indication of the sizes of the beasts as are the skeletons themselves. Dr Olsen and his colleagues therefore concentrated on prints, not bones.

**D.** The prints in question were made in eastern North America, a part of the world then full of rift valleys similar to those in East Africa today. Like the modern African rift valleys, the Triassic /Jurassic American ones contained lakes, and these lakes grew and shrank at regular intervals because of climatic changes caused by periodic shifts in the earth's orbit. (A similar phenomenon is responsible for modern ice ages.) That regularity, combined with reversals in the earth's magnetic field, which are detectable in the tiny fields of certain magnetic minerals, means that rocks from this place and period can be dated to within a few thousand years. As a bonus, squish lake-edge sediments are just the things for recording the tracks of passing animals. By dividing the labour between themselves, the ten authors of the paper were able to study such tracks at 80 sites.

**E.** The researchers looked at 18 so-called ichnotaxa. These are recognizable types of footprint that cannot be matched precisely with the species of animal that left them. But they can be matched with a general sort of animal, and thus act as an indicator of the fate of that group, even when there are no bones to tell the story. Five of the ichnotaxa disappear before the end of the Triassic, and four march confidently across the boundary into the Jurassic. Six, however, vanish at the boundary, or only just splutter across it; and three appear from nowhere, almost as soon as the Jurassic begins.

**F.** That boundary itself is suggestive. The first geological indication of the impact that killed the dinosaurs was an unusually high level of iridium in rocks at the end of the Cretaceous, when the beasts disappear from the fossil record. Iridium is normally rare at the earth's surface, but it is more abundant in meteorites. When people began to believe the impact theory, they started looking for other Cretaceous-end anomalies. One that turned up was a surprising abundance of fern spores in rocks just above the boundary layer—a phenomenon known as a "fern spike"

**G.** That matched the theory nicely. Many modern ferns are opportunists. They cannot compete against plants with leaves, but if a piece of land is cleared by, say, a volcanic eruption, they are often the first things to set up shop there. An asteroid strike would have scoured much of the earth of its vegetable cover, and provided a paradise for ferns. A fern spike in the rocks is thus a good indication that something terrible has happened.

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**H.** Both an iridium anomaly and a fem spike appear in rocks at the end of the Triassic, too. That accounts for the disappearing ichnotaxa: the creatures that made them did not survive the holocaust. The surprise is how rapidly the new ichnotaxa appear.

**I.** Dr Olsen and his colleagues suggest that the explanation for this rapid increase in size may be a phenomenon called ecological release. This is seen today when reptiles (which, in modern times, tend to be small creatures) reach islands where they face no competitors. The most spectacular example is on the Indonesian island of Komodo, where local lizards have grown so large that they are often referred to as dragons. The dinosaurs, in other words, could flourish only when the competition had been knocked out.

**J.** That leaves the question of where the impact happened. No large hole in the earth's crust seems to be 202m years old. It may, of course, have been overlooked. Old craters are eroded and buried, and not always easy to find. Alternatively, it may have vanished. Although continental crust is more or less permanent, the ocean floor is constantly recycled by the tectonic processes that bring about continental drift. There is no ocean floor left that is more than 200m years old, so a crater that formed in the ocean would have been swallowed up by now.

**K.** There is a third possibility, however. This is that the crater is known, but has been misdated. The Manicouagan “structure”, a crater in Quebec, is thought to be 214m years old. It is huge—some 100km across—and seems to be the largest of between three and five craters that formed within a few hours of each other as the lumps of a disintegrated comet hit the earth one by one.

### *Questions 1-6*

*Do the following statements agree with the information given in Reading Passage?*

*True if the statement agrees with the information*

*False if the statement contradicts the information*

*NOT GIVEN If there is no information on this*

- Q1.** Dr Paul Olsen and his colleagues believe that asteroid knock may also lead to dinosaurs' boom.
- Q2.** Books and movie like *Jurassic Park* often exaggerate the size of the dinosaurs.
- Q3.** Dinosaur footprints are more adequate than dinosaur skeletons.
- Q4.** The prints were chosen by Dr Olsen to study because they are more detectable than earth magnetic field to track a date of geological precise within thousands years.
- Q5.** Ichnotaxa showed that footprints of dinosaurs offer exact information of the trace left by an individual species.
- Q6.** We can find more Iridium in the earth's surface than in meteorites.

## TEST 5 - Finches on Islands

**A.** Today, the quest continues. On Daphne Major —one of the most desolate of the Galápagos Islands, an uninhabited volcanic cone where cacti and shrubs seldom grow higher than a researcher's knee Peter and Rosemary Grant have spent more than three decades watching Darwin's finches respond to the challenges of storms, drought and competition for food. Biologists at Princeton University, the Grants know and recognize many of the individual birds on the island and can trace the birds' lineages back through time. They have witnessed Darwin's principle in action again and again, over many generations of finches.

**B.** The Grants' most dramatic insights have come from watching the evolving bill of the medium ground finch. The plumage of this sparrow-sized bird ranges from dull brown to jet black. At first glance, it may not seem particularly striking, but among scientists who study evolutionary biology, the medium ground finch is a superstar. Its bill is a middling example in the array of shapes and sizes found among Galapagos finches: heftier than that of the small ground finch, which specializes in eating small, soft seeds, but petite compared to that of the large ground finch, an expert at cracking and devouring big, hard seeds.

**C.** When the Grants began their study in the 1970s, only two species of finch lived on Daphne Major, the medium ground finch and the cactus finch. The island is so small that the researchers were able to count and catalogue every bird. When a severe drought hit in 1977, the birds soon devoured the last of the small, easily eaten seeds. Smaller members of the medium ground finch population, lacking the bill strength to crack large seeds, died out.

**D.** Bill and body size are inherited traits, and the next generation had a high proportion of big-billed Individuals. The Grants had documented natural selection at work the same process that over many millennia, directed the evolution of the Galápagos' 14 unique finch species, all descended from a common ancestor that readied the islands a few million years ago.

**E.** Eight years later, heavy rains brought by an El Nino transformed the normally meager vegetation on Daphne Major. vines and other plants that in most years struggle for survival suddenly flourished, choking out the plants that provide large seeds to the finches. Small seeds came to dominate the food supply, and big birds with big bills died out at a higher rate than smaller ones. 'Natural selection is observable,' Rosemary Grant says. 'It happen when the environment changes. When local conditions reverse themselves, so does the direction of adaptation.'

**F.** Recently, die Grants witnessed another form of natural selection acting on the medium ground finch: competition from bigger, stronger cousins. In 1982, a third finch, the large ground finch, came to live on Daphne Major. The stout bills of these birds resemble the business end of a crescent wrench. Their arrival was the first such colonization recorded on the Galapagos in nearly a century of scientific observation. 'We realized,' Peter Grant says, 'we had a very unusual and potentially important event to follow. For 20 years, the large ground finch coexisted with the medium ground finch, which shared five supply of large seeds with its bigger-billed relative. Then, in 2002 and 2003, another drought struck. None of the birds nested that year, and many died out. Medium ground finches with large bills, crowded out of feeding areas by the more powerful large ground finches, were hit particularly hard.

**G.** When wetter weather returned in 2004, and the finches nested again, the new generation of the medium ground finch was dominated by smaller birds with smaller bills, able to survive on smaller seeds. This situation, says Peter Grant, marked the first time that biologists have been able to follow the complete

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process of an evolutionary change due to competition between, species and the strongest response to natural selection that he had seen in 33 years of tracking Galapagos finches.

**H.** On the inhabited island of Santa Cruz, just south of Daphne Major, Andrew Hendry of McGill University and Jeffrey Podos of the University of Massachusetts at Amherst have discovered a new, man-made twist in finch evolution. Their study focused on birds living near the Academy Bay research station, on the fringe of the town of Puerto Ayora. The human population of the area has been growing fast—from 900 people in 1974 to 9,582 In 2001. Today Puerto Ayorn is full of hotels and mai tai bars,' Hendry says. 'People have taken tills extremely arid place and tried to turn it into a Caribbean resort.

**I.** Academy Bay records dating back to the early 1960s show that medium ground finches captured there had either small or large bills. Very few of the birds had mid-size bills. The finches appeared to be in the early stages of a new adaptive radiation: If the trend continued, the medium ground finch on Santa Cruz could split into two distinct subspecies, specializing in different types of seeds. But in the late 1960s and early 70s, medium ground finches with medium-sized bills began to thrive at Academy Bay along with small and large billed birds. The booming human population had introduced new food sources, including exotic plants and bird feeding stations stocked with rice. Billsize, once critical to the fishes' survival, no longer made any difference. 'Now an intermediate bill can do fine' Hendry says.

**J.** At a control site distant from Puerto Ayora, and relatively untouched by humane, the medium ground finch population remains split between large- and small-billed birds. On undisturbed parts of Santa Cruz, there Is no ecological niche for a middling medium ground finch, and the birds continue to diversify. In town, though there are still many finches, once-distinct populations are merging.

**K.** The finches of Santa Cruz demonstrate a subtle process in which human meddling can stop evolution In Its tracks, outing the formation of new species. In a time when global biodiversity continues Its downhill slide, Darwin's finches have yet another unexpected lesson to teach. 'If we hope to regain some of the diversity that's already been lost/ Hendry says, 'we need to protect not just existing creatures, but also the processes that drive the origin of new species.

### *Questions 1-5*

*Do the following statements agree with the information given in Reading Passage?*

*True if the statement agrees with the information*

*False if the statement contradicts the information*

*NOT GIVEN If there is no information on this*

- Q1.** Grants' discovery has questioned Darwin's theory.
- Q2.** The cactus finches are less affected by food than the medium ground finch.
- Q3.** In 2002 and 2003, all the birds were affected by the drought.
- Q4.** The discovery of Andrew Hendry and Jeffrey Podos was the same as that of the previous studies.
- Q5.** It is shown that the revolution in finches on Santa Cruz is likely a response to human intervention.



## **TEST 6 - Koalas**

**A.** Koalas are just too nice for their own good. And except for the occasional baby taken by birds of prey, koalas have no natural enemies. In an ideal world, the life of an arboreal couch potato would be perfectly safe and acceptable.

**B.** Just two hundred years ago, koalas flourished across Australia. Now they seem to be in decline, but exact numbers are not available as the species would not seem to be 'under threat'. Their problem, however, has been man, more specifically, the white man. Koala and aborigine had co-existed peacefully for centuries.

**C.** Today koalas are found only in scattered pockets of southeast Australia, where they seem to be at risk on several fronts. The koala's only food source, the eucalyptus tree has declined. In the past 200 years, a third of Australia's eucalyptus forests have disappeared. Koalas have been killed by parasites, chlamydia epidemics and a tumour-causing retro-virus. And every year 11000 are killed by cars, ironically most of them in wildlife sanctuaries, and thousands are killed by poachers. Some are also taken illegally as pets. The animals usually soon die, but they are easily replaced.

**D.** Bush fires pose another threat. The horrific ones that raged in New South Wales recently killed between 100 and 1000 koalas. Many that were taken into sanctuaries and shelters were found to have burnt their paws on the glowing embers. But zoologists say that the species should recover. The koalas will be aided by the eucalyptus, which grows quickly and is already burgeoning forth after the fires. So the main problem to their survival is their slow reproductive rate - they produce only one baby a year over a reproductive lifespan of about nine years.

**E.** The latest problem for the species is perhaps more insidious. With plush, grey fur, dark amber eyes and button nose, koalas are cuddliness incarnate. Australian zoos and wildlife parks have taken advantage of their uncomplaining attitudes, and charge visitors to be photographed hugging the furry bundles. But people may not realise how cruel this is, but because of the koala's delicate disposition, constant handling can push an already precariously balanced physiology over the edge.

**F.** Koalas only eat the foliage of certain species of eucalyptus trees, between 600 and 1250 grams a day. The tough leaves are packed with cellulose, tannins, aromatic oils and precursors of toxic cyanides. To handle this cocktail, koalas have a specialised digestive system. Cellulosedigesting bacteria in the break down fibre, while a specially adapted gut and liver process the toxins. To digest their food properly, koalas must sit still for 21 hours every day.

**G.** Koalas are the epitome of innocence and inoffensiveness. Although they are capable of ripping open a man's arm with their needle-sharp claws, or giving a nasty nip, they simply wouldn't. If you upset a koala, it may blink or swallow, or hiccup. But attack? No way! Koalas are just not aggressive. They use their claws to grip the hard smooth bark of eucalyptus trees.

**H.** They are also very sensitive, and the slightest upset can prevent them from breeding, cause them to go off their food, and succumb to gut infections. Koalas are stoic creatures and put on a brave face until they are at death's door. One day they may appear healthy, the next they could be dead. Captive koalas have to be weighed daily to check that they are feeding properly. A sudden loss of weight is usually the only warning keepers have that their charge is ill. Only two keepers plus a vet were allowed to handle London Zoo's koalas, as these creatures are only comfortable with people they know. A request for the koala to be taken to

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meet the Queen was refused because of the distress this would have caused the marsupial. Sadly, London's Zoo no longer has a koala. Two years ago the female koala died of a cancer caused by a retrovirus. When they come into heat, female koalas become more active, and start losing weight, but after about sixteen days, heat ends and the weight piles back on. London's koala did not. Surgery revealed hundreds of pea-sized tumours. Almost every zoo in Australia has koalas - the marsupial has become the Animal Ambassador of the nation, but nowhere outside Australia would handling by the public be allowed. Koala cuddling screams in the face of every rule of good care. First, some zoos allow koalas to be passed from stranger to stranger, many children who love to squeeze. Secondly, most people have no idea of how to handle the animals; they like to cling on to their handler, all in their own good time and use his or her arm as a tree. For such reasons, the Association of Fauna and Marine parks, an Australian conservation society is campaigning to ban koala cuddling. Policy on koala handling is determined by state government authorities. "And the largest of the numbers in the Australian Nature Conservation Agency, with the aim of instituting national guidelines. Following a wave of publicity, some zoos and wildlife parks have stopped turning their koalas into photo.

### *Questions 1-7*

*Do the following statements agree with the information given in Reading Passage?*

*True if the statement agrees with the information*

*False if the statement contradicts the information*

*NOT GIVEN If there is no information on this*

- Q1.** new coming human settlers caused danger to koalas.
- Q2.** Koalas can still be seen in most of the places in Australia.
- Q3.** it takes decade for the eucalyptus trees to recover after the fire.
- Q4.** Koalas will fight each other when food becomes scarce.
- Q5.** It is not easy to notice that koalas are ill.
- Q6.** Koalas are easily infected with human contagious disease via cuddling
- Q7.** Koalas like to hold a person's arm when they are embraced.

## TEST 7 - THE ORIGIN OF WRITING

Writing was first invented by the Sumerians in ancient Mesopotamia before 3,000 BC. It was also independently invented in Meso-America before 600 BC and probably independently invented in China before 1,300 BC. It may have been independently invented in Egypt around 3,000 BC although given the geographical proximity between Egypt and Mesopotamia the Egyptians may have learnt writing from the Sumerians.

There are three basic types of writing systems. The written signs used by the writing system could represent either a whole word, a syllable or an individual sound. Where the written sign represents a word the system is known as logographic as it uses logograms which are written signs that represent a word. The earliest writing systems such as the Sumerian cuneiform, Egyptian hieroglyphics and Mayan glyphs are predominantly logographics as are modern Chinese and Japanese writing systems. Where the written sign represents a syllable the writing system is known as syllabic. Syllabic writing systems were more common in the ancient world than they are today. The Linear A and B writing systems of Minoan Crete and Mycenaean Greece are syllabic. The most common writing systems today are alphabetical. These involve the written sign (a letter) representing a single sound (known as a phoneme). The earliest known alphabetical systems were developed by speakers of Semitic languages around 1700 BC in the area of modern day Israel and Palestine. All written languages will predominately use one or other of the above systems. They may however partly use the other systems. No written language is purely alphabetic, syllabic or logographic but may use elements from any or all systems.

Such fully developed writing only emerged after development from simpler systems. Tally sticks with notches on them to represent a number of sheep or to record a debt have been used in the past. Knotted strings have been used as a form of record keeping particularly in the area around the Pacific rim. They reached their greatest development with the Inca quipu where they were used to record payment of tribute and to record commercial transactions. A specially trained group of quipu makers and readers managed the whole system. The use of pictures for the purpose of communication was used by native Americans and by the Ashanti and Ewe people in Africa. Pictures can show qualities and characteristics which can not be shown by tally sticks and knot records. They do not however amount to writing as they do not bear a conventional relationship to language.

An alternative idea was that a system by which tokens, which represented objects like sheep, were placed in containers and the containers were marked on the outside indicating the number and type of tokens within the container gave rise to writing in Mesopotamia. The marks on the outside of the container were a direct symbolic representation of the tokens inside the container and an indirect symbolic representation of the object the token represented. The marks on the outside of the containers were graphically identical to some of the earliest pictograms used in Sumerian cuneiform, the world's first written language. However, cuneiform has approximately 1,500 signs and the marks on the outside of the containers can only explain the origins of a few of those signs.

The first written language was the Sumerian cuneiform. Writing mainly consisted of records of numbers of sheep, goats and cattle and quantities of grain. Eventually clay tablets were used as a writing surface and were marked with a reed stylus to produce the writing. Thousands of such clay tablets have been found in the Sumerian city of Uruk. The earliest Sumerian writing consists of pictures of the objects mentioned such as sheep or cattle. Eventually the pictures became more abstract and were to consist of straight lines that looked like wedges.

The earliest cuneiform was an accounting system consisting of pictograms representing commodities such as sheep and a number. The clay tablets found might for example simply state "ten sheep". Such writing obviously has its limitations and would not be regarded as a complete writing system. A complete writing system only developed with the process of phonetization. This occurs when the symbol ceases to represent an object and begins to represent a spoken sound, which in early cuneiform would be a word. This

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process was assisted when the symbols which initially looked very like the object they represented gradually became more abstract and less clearly related to an object. However, while the symbol became more closely connected to words, it was words dealing with objects, such as sheep, bird or pot. It was still not possible to write more abstract ideas such as father, running, speech or foreigner.

The solution to this problem was known as the rebus principle. Words with the same or similar pronunciation to an abstract word could be used to represent the abstract word. The sign for eye could be used to represent the word "I". The sign for deer could represent the word "dear". Which word is referred to by the picture is decided by an additional sign. Pictographs which originally represented a word began to represent the sound of the word.

The rebus principle is used to represent abstract words in all word writing systems in Sumer, Egypt, China and in the Aztec and Mayan writing in central America. The Rebus principle led to cuneiform becoming a form of logo-syllabic writing consisting of both logograms and syllabic writing. The effect of the change from logographic to logo-syllabic writing was substantial. Logographic writing cannot produce normal prose and is restricted to nouns, numbers, names and adjectives. The vast majority of early Sumerian writing consisted of bureaucratic records of products received or products distributed. Only when syllabic writing was introduced into cuneiform did it become possible to write prose such as myths and royal propaganda.

The next major development in writing in the old world was the development of the alphabet. The alphabet was developed out of Egyptian hieroglyphs which contained 24 signs for 24 Egyptian consonants. About 1700 BC Semites who knew Egyptian hieroglyphs began making certain changes in their writing system. They put the letters in a particular sequence and gave them simple names to assist learning and ease of memory. They also dropped the logograms and other signs used in hieroglyphs and just kept the Egyptian consonants and restricted the signs to those for individual consonants. Finally, they introduced vowels into their alphabet. Alphabets were soon to spread over most of the world as they provide both flexibility and simplicity for a writing system.

### *Questions 1-7*

*Do the following statements agree with the information given in Reading Passage?*

*True if the statement agrees with the information*

*False if the statement contradicts the information*

*NOT GIVEN If there is no information on this*

- Q1.** There is no language that adopts elements from only one writing system.
- Q2.** Inca quipus used talley sticks to track payments and commercial transactions.
- Q3.** The marks on the outside of the containers originated from pictograms used in Sumerian cuneiform.
- Q4.** The first written language was created to document the quantities and types of livestock and food.
- Q5.** Cuneiform could not express abstract concepts at all.
- Q6.** Affected by the rebus principle, cuneiform combined the elements of both logograms and syllabic writing.
- Q7.** Most countries adopt alphabetical writing systems due to their flexibility and simplicity.

## TEST 8 - Bondi Beach

**A.** Bondi Beach, Australia's most famous beach, is located in the suburb of Bondi, in the Local Government Area of Waverley, seven kilometers from the centre of Sydney. "Bondi" or "Boondi" is an Aboriginal word meaning water breaking over rocks or the sound of breaking waves. The Australian Museum records that Bondi means place where a flight of nullas took place. There are Aboriginal Rock carvings on the northern end of the beach at Ben Buckler and south of Bondi Beach near McKenzies Beach on die coastal walk.

**B.** The indigenous people of the area at the time of European settlement have generally been welcomed to as the Sydney people or the Eora (Eora means "the people"). One theory describes the Eora as a sub-group of the Darug language group which occupied the Cumberland Plain west to the Blue Mountains. However, another theory suggests that they were a distinct language group of then own. There is no clear evidence for the name or names of the particular band(s) of the Eora that roamed what is now the Waverley area, A number of place names within Waverley, most famously Bondi, have been based on words derived from Aboriginal languages of the Sydney region.

**C.** From the mid-1800s Bondi Beach was a favourite location for family outings and picnics. The beginnings of the suburb go back to 1809, when the early road builder, William Roberts, received from Governor Bligh a grant of 81 hectares of what is now most of the business and residential area of Bondi Beach. In 1851, Edward Smith Hall and Francis O'Brien purchased 200 acres of the Bondi area that embraced almost the whole frontage of Bondi Beach, and it was named the "The Bondi Estate." Between 1855 and 1877 O'Brien purchased Hall's share of the land, renamed the land the "O'Brien Estate," and made the beach and the surrounding land available to the public as a picnic ground and amusement resort. As the beach became increasingly popular, O'Brien threatened to stop public beach access. However, die Municipal Council believed that the Government needed to intervene to make the beach a public reserve.

**D.** During the 1900s beach became associated with health, leisure and democracy - a playground everyone could enjoy equally. Bondi Beach was a working class suburb throughout most of the twentieth century with migrant people from New Zealand comprising the majority of the local population. The first tramway reached the beach in 1884. Following this, tram became the first public transportation in Bondi- As an alternative, this action changed die rule that only rich people can enjoy the beach- By the 1930s Bondi was drawing not only local visitors but also people from elsewhere in Australia and overseas. Advertising at the time referred to Bondi Beach *as* the "Playground of the Pacific".

**E.** There is a growing trend that people prefer having relax near seaside instead of living unhealthily in cities. The increasing popularity of sea bathing during the late 1800s and early 1900s raised concerns about public safety and how to prevent people from drowning. In response, the world's first formally documented surf lifesaving club, the Bondi Surf Bathers' life Saving Club, was formed in 1907. This was powerfully reinforced by the dramatic events of "Black Sunday" at Bondi in 1938. Some 35,000 people were on the beach and a large group of life savers were about to start a surf race when three freak waves hit the beach, sweeping hundreds of people out to sea. Lifesavers rescued 300 people. The largest mass rescue in the history of surf bathing, it confirmed the place of the life saver i n the national imagination.

**F.** Bondi Beach Is the end point of the City to Surf Fun Run which is held each year in August Australian surf carnivals further instilled this image. A Royal Surf Carnival was held at Bondi Beach for the Queen Elizabeth n during her first visited in Australia, in 1954. Since 1867, there have been over fifty visits by a member of the British Royal Family to Australia. In addition to many activities, the Bondi Beach



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Markets is open every Sunday. Many wealthy people spend Christmas Day at the beach. However, the shortage of houses occurs when lots of people crushed to seaside. Manly is the seashore town which solved this problem. However, people still choose Bondi as the satisfied destination rather than Manly.

**G.** Bondi Beach has a commercial area along Campbell Parade and adjacent side streets, featuring many popular cafes, restaurants, and hotels, with views of the contemporary beach. It is depicted as wholly modern and European. In the last decade, Bondi Beaches' unique position has been a dramatic rise in svelte houses and apartments to take advantage of the views and scent of the sea. The valley naming down to the beach is famous world over for its view of distinctive red tiled roofs. Those architectures are deeply influenced by British coastal town.

**H.** Bondi Beach hosted the beach volleyball competition at the 2000 Summer Olympics. A temporary 10,000-seat stadium, a much smaller stadium, 2 warmup courts, and 3 training courts were set up to host the tournament. The Bondi Beach Volleyball Stadium was constructed for it and stood for just six weeks. Campaigners oppose both the social and environmental consequences of the development. The stadium will divide the beach in two and seriously restrict public access for swimming, walking, and other forms of outdoor recreation. People protest for their human rights of having a pure seaside and argue for health life in Bondi.

**I.** "They're prepared to risk lives and risk the Bondi beach environment for the sake of eight days of volleyball", said Stephen Uniacke, a construction lawyer involved in the campaign. Other environmental concerns include the possibility that soil dredged up from below the sand will acidify when brought to the surface.

### *Questions 1-5*

*Do the following statements agree with the information given in Reading Passage?*

*True if the statement agrees with the information*

*False if the statement contradicts the information*

*NOT GIVEN If there is no information on this*

- Q1.** The name of the Bondi beach is first called by the British settlers.
- Q2.** The aboriginal culture in Australia is different when compared with European culture.
- Q3.** Bondi beach area holds many contemporary hotels
- Q4.** The seaside town in Bondi is affected by British culture for its characteristic red color.
- Q5.** Living near Bondi seashore is not beneficial for health.

## **TETS 9 - Tea and Industrial Revolution**

**A.** Alan Macfarlane thinks he could rewrite history. The professor of anthropological science at King's College, Cambridge has, like other historians, spent decades trying to understand the enigma of the Industrial Revolution. Why did this particular important event - the worldchanging birth of industry - happen in Britain? And why did it happen at the end of the 18th century?

**B.** Macfarlane compares the question to a puzzle. He claims that there were about 20 different factors and all of them needed to be present before the revolution could happen. The chief conditions are to be found in history textbooks. For industry to 'take off', there needed to be the technology and power to drive factories, large urban populations to provide cheap labour easy transport to move goods around, an affluent middle-class willing to buy mass-produced objects, a market-driven economy, and a political system that allowed this to happen. While this was the case for England, other nations, such as Japan, Holland and France also met some of these criteria. All these factors must have been necessary but not sufficient to cause the revolution. Holland had everything except coal, while China also had many of these factors.

**C.** Most historians, however, are convinced that one or two missing factors are needed to solve the puzzle. The missing factors, he proposes, are to be found in every kitchen cupboard. Tea and beer, two of the nation's favorite drinks, drove the revolution. Tannin, the active ingredient in tea, and hops, used in making beer, both contain antiseptic properties. This -plus the fact that both are made with boiled water- helped prevent epidemics of waterborne diseases, such as dysentery, in densely populated urban areas. The theory initially sounds eccentric but his explanation of the detective work that went into his deduction and the fact his case has been strengthened by a favorable appraisal of his research by Roy Porter (distinguished medical historian) the skepticism gives way to wary admiration.

**D.** Historians had noticed one interesting factor around the mid-18th century that required explanation. Between about 1650 and 1740, the population was static. But then there was a burst in population. The infant mortality rate halved in the space of 20 years, and this happened in both rural areas and cities, and across all classes. Four possible causes have been suggested. There could have been a sudden change in the viruses and bacteria present at that time, but this is unlikely. Was there a revolution in medical science? But this was a century before Lister introduced antiseptic surgery. Was there a change in environmental conditions? There were improvements in agriculture that wiped out malaria, but these were small gains. Sanitation did not become widespread until the 19<sup>th</sup> century. The only option left was food. But the height and weight statistics show a decline. So the food got worse. Efforts to explain this sudden reduction in child deaths appeared to draw a blank.

**E.** This population burst seemed to happen at just the right time to provide labor for the Industrial Revolution. But why? When the Industrial Revolution started, it was economically efficient to have people crowded together forming towns and cities. But with crowded living conditions comes disease, particularly from human waste. Some research in the historical records revealed that there was a change in the incidence of waterborne disease at that time, the English were protected by the strong antibacterial agent in hops, which were added to make beer last. But in the late 17th century a tax was introduced on malt. The poor turned to water and gin, and in the 1720s the mortality rate began to rise again.

**F.** Macfarlane looked to Japan, which was also developing large cities about the same time, and also had no sanitation. Waterborne diseases in the Japanese population were far fewer than those in Britain. Could it be the prevalence of tea in their culture? That was when Macfarlane thought about the role of tea in

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Britain. The history of tea in Britain provided an extraordinary coincidence of dates. Tea was relatively expensive until Britain started direct trade with China in the early 18th century. By the 1740s, about the time that infant mortality was falling, the drink was common. Macfarlane guesses that the fact that water had to be boiled, together with the stomach-purifying properties of tea so eloquently described in Buddhist texts, meant that the breast milk provided by mothers was healthier than it had ever been. No other European nation drank tea so often as the British, which, by Macfarlane's logic, pushed the other nations out of the race for the Industrial Revolution.

**G.** But, if tea is a factor in the puzzle, why didn't this cause an industrial revolution in Japan? Macfarlane notes that in the 17th century, Japan had large cities, high literacy rates and even a futures market. However, Japan decided against a work-based revolution, by giving up labor-saving devices even animals, to avoid putting people out of work. Astonishingly, the nation that we now think of as one of the most technologically advanced, entered the 19<sup>th</sup> century having almost abandoned the wheel. While Britain was undergoing the Industrial Revolution, Macfarlane notes wryly, Japan was undergoing an industrious one.

### **Questions 1-6**

*Do the following statements agree with the information given in Reading Passage?*

*True if the statement agrees with the information*

*False if the statement contradicts the information*

*NOT GIVEN If there is no information on this*

- Q1.** The industrialization did not happen in China because of its inefficient railway transportation.
- Q2.** Tea and beer contributed to protect people from waterborne disease.
- Q3.** Roy Porter disagreed with the proposed theory about the missing factors
- Q4.** The reason of lower child deaths is fully explained by food.
- Q5.** The British made beer by themselves.
- Q6.** Tax on malt indirectly affected the increase of population in late 17th century.

## TEST 10 - Dyslexia

People who left school unable to read were often dismissed as being lazy. Some probably were but many were simply unable to learn because they were dyslexic. Four key findings now suggest that dyslexia is an organic problem and not a motivational one. Firstly, the brain anatomy of dyslexics differs slightly from those of non-dyslexics. Secondly their brain functions as measured by electrical activity are dissimilar. Thirdly they have behavioral differences apart from an inability to read. Finally, there is more and more evidence to suggest that their condition is linked to particular genes.

The anatomical differences between the brains of dyslexics and non-dyslexics were first noticed in 1979 by Albert Galaburda of Harvard Medical School. He found two sorts of microscopic flaws in the language centres of dyslexic's brains. These are called ectoplasts and microgyria.

The language centres form part of the cerebral cortex and are situated on the left side of the brain. The cortex consists of six layers of cells. An ectopia is a collection of nerve cells that push up from the lower layers of the cortex into the outer ones, where they are not normally found. A microgyrus is a small fold in the cortex which results in a reduction in the normal number of layers from six to four.

The formation of microgyria causes confusion in the neural connections between the language centres and other parts of the brain. Microgyria have been induced in rat embryos and as adults these rats are found to have a reduced ability in distinguishing between two sounds played in quick succession. This inability to distinguish between two sounds in quick succession is also a symptom of dyslexia in people.

Dyslexia not only affects language centres but also causes brain abnormalities in visual pathways as well. One such abnormality is the reduction in the cell size in the layers of the lateral geniculate nucleus. This is where the nerve tracts which transmit information from the eyes to the visual cortex at the back of the brain are found. This is significant as dyslexia is essentially an inability to deal with linguistic information in visual form.

This parallel failure of visual and auditory systems is seen elsewhere in the brain. Guinevere Eden and Thomas Zeffiro, who work at Georgetown University in Washington D. C. have found an example of it using a brain scanning technique called functional magnetic resonance imaging.(MRI)

A fundamental characteristic of dyslexia is difficulty in processing written phenomes. Phenomes are the units of sound which make up a language. By giving dyslexic people tasks such as removing phenomes from the beginning of words, while at the same time monitoring brain activity with their scanner, Dr Eden and Dr Zeffiro were able to stimulate both the visual and auditory pathways simultaneously. Their findings demonstrated that dyslexics showed low activity in a part of the brain called Brodmann's area 37, another part of the brain where visual and auditory information are handled in close proximity.

Dr Eden and Dr Zeffiro have also compared the brain activity of dyslexic and non-dyslexic readers who were given a task not related to reading. Another symptom of dyslexia is difficulty in detecting visual motion. On this basis Dr Eden and Dr Zeffiro devised a task whereby people were asked to look at dots on a screen and identify which of them was moving and in which direction. While monitoring brain activity with the scanner, it was found that dyslexics performing this task showed significantly less brain activity in Brodmann's area 37 than non-dyslexics. As this task did not require reading skills it could be used to test children for incipient dyslexia before they reach the reading age; then they could be given special tuition.

To broaden their investigation, Dr Eden and Dr Zeffiro teamed up with Frank Wood and his colleagues at the Wake Forest University School of Medicine in North Carolina, an institution specializing in dyslexia. Dr Eden and Dr Zeffiro borrowed some of its patients and monitored them in the fMRI machine at Georgetown University. This was done both before and after the individuals had participated in an intensive programme designed to improve their reading. Non-dyslexics were also scanned and used as controls in the investigation.

The results were significant. After the programme, the participants showed enhanced brain activity while reading. However this activity was not on the left side of the brain but in areas on the right side,

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corresponding exactly to language centres in the opposite hemisphere. The reading programme had stimulated the brains of the participants to recruit batches of nerve cells in a place not normally associated with language processing.

The primary cause for these problems is another of Dr Wood's interests. The abnormal brain tissue in dyslexia is developed by the fifth month of gestation, which indicates that the cause of the disorder must act before that time. This suggests that it may be genetic. Many people argue about the relative contributions of genes and the environment to human behaviour and human disease. Dyslexia is both behavioural and, to a certain degree, it is a disease. It appears to have a biological origin and genetic roots. Yet looking at it from a different angle its cause is almost purely environmental. People living in illiterate societies are hardly troubled by its other symptoms. It was the invention of writing that brought the difficulty to light, not the mutation of genes. Nature or environment? You will have to decide between the two.

### *Questions 1-6*

*Do the following statements agree with the information given in Reading Passage?*

*True if the statement agrees with the information*

*False if the statement contradicts the information*

*NOT GIVEN If there is no information on this*

Q1. Dyslexia is probably caused by motivational problems.

Q2. Dyslexia affects language as well as visual and audio processes.

Q3. In modern society dyslexia is essentially the inability to distinguish between visual forms.

Q4. It has been demonstrated that special reading programmes can teach dyslexic people to read as well as non- dyslexic ones.

Q5. The cause of dyslexia is partly genetic and partly environmental.

Q6. The writer of the article believes that dyslexia can most effectively be cured in illiterate societies.



# MATCHING HEADINGS

## Mini warm-up practice test – Match headings

### Questions 1-7

*The passage has seven paragraphs A-G.*

*Choose the correct heading for each paragraph from the list of headings below.*

#### List of headings

- i** Early years of Gilbert
- ii** What was new about his scientific research method
- iii** The development of chemistry
- iv** Questioning traditional astronomy
- v** Pioneers of the early science
- vi** Professional and social recognition
- vii** Becoming the president of the Royal Science Society
- viii** The great works of Gilbert
- ix** His discovery about magnetism
- x** His change of focus

### William Gilbert and Magnetism

A

The 16th and 17th centuries saw two great pioneers of modern science: Galileo and Gilbert. The impact of their findings is eminent. Gilbert was the first modern scientist, also the accredited father of the science of electricity and magnetism, an Englishman of learning and a physician at the court of Elizabeth. Prior to him, all that was known of electricity and magnetism was what the ancients knew, nothing more than that the lodestone possessed magnetic properties and that amber and jet, when rubbed, would attract bits of paper or other substances of small specific gravity. However, he is less well known than he deserves.

B

Gilbert's birth pre-dated Galileo. Born in an eminent local family in Colchester County in the UK, on May 24, 1544, he went to grammar school, and then studied medicine at St John's College, Cambridge, graduating in 1573. Later he travelled in the continent and eventually settled down in London.

C

He was a very successful and eminent doctor. All this culminated in his election to the president of the Royal Science Society. He was also appointed personal physician to the Queen (Elizabeth I), and later knighted by the Queen. He faithfully served her until her death. However, he didn't outlive the Queen for long and died on November 30, 1603, only a few months after his appointment as personal physician to King James.

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D	
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Gilbert was first interested in chemistry but later changed his focus due to the large portion of mysticism of alchemy involved (such as the transmutation of metal). He gradually developed his interest in physics after the great minds of the ancient, particularly about the knowledge the ancient Greeks had about lodestones, strange minerals with the power to attract iron. In the meantime, Britain became a major seafaring nation in 1588 when the Spanish Armada was defeated, opening the way to British settlement of America. British ships depended on the magnetic compass, yet no one understood why it worked. Did the Pole Star attract it, as Columbus once speculated; or was there a magnetic mountain at the pole, as described in Odyssey, which ships would never approach, because the sailors thought its pull would yank out all their iron nails and fittings? For nearly 20 years, William Gilbert conducted ingenious experiments to understand magnetism. His works include *On the Magnet*, *Magnetic Bodies*, and *the Great Magnet of the Earth*.

E	
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Gilbert's discovery was so important to modern physics. He investigated the nature of magnetism and electricity. He even coined the word "electric". Though the early beliefs of magnetism were also largely entangled with superstitions such as that rubbing garlic on lodestone can neutralise its magnetism, one example being that sailors even believed the smell of garlic would even interfere with the action of compass, which is why helmsmen were forbidden to eat it near a ship's compass. Gilbert also found that metals can be magnetised by rubbing materials such as fur, plastic or the like on them. He named the ends of a magnet "north pole" and "south pole". The magnetic poles can attract or repel, depending on polarity. In addition, however, ordinary iron is always attracted to a magnet. Though he started to study the relationship between magnetism and electricity, sadly he didn't complete it. His research of static electricity using amber and jet only demonstrated that objects with electrical charges can work like magnets attracting small pieces of paper and stuff. It is a French guy named du Fay that discovered that there are actually two electrical charges, positive and negative.

F	
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He also questioned the traditional astronomical beliefs. Though a Copernican, he didn't express in his quintessential beliefs whether the earth is at the centre of the universe or in orbit around the sun. However, he believed that stars are not equidistant from the earth but have their own earth-like planets orbiting around them. The earth itself is like a giant magnet, which is also why compasses always point north. They spin on an axis that is aligned with the earth's polarity. He even likened the polarity of the magnet to the polarity of the earth and built an entire magnetic philosophy on this analogy. In his explanation, magnetism is the soul of the earth. Thus a perfectly spherical lodestone, when aligned with the earth's poles, would wobble all by itself in 24 hours. Further, he also believed that the sun and other stars wobble just like the earth does around a crystal core, and speculated that the moon might also be a magnet caused to orbit by its magnetic attraction to the earth. This was perhaps the first proposal that a force might cause a heavenly orbit.

G	
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His research method was revolutionary in that he used experiments rather than pure logic and reasoning like the ancient Greek philosophers did. It was a new attitude towards scientific investigation. Until then, scientific experiments were not in fashion. It was because of this scientific attitude, together with his contribution to our knowledge of magnetism, that a unit of magneto motive force, also known as magnetic potential, was named Gilbert in his honour. His approach of careful observation and experimentation rather than the authoritative opinion or deductive philosophy of others had laid the very foundation for modern science.

## TEST 1 - Music: Language We All Speak

*The passage has seven paragraphs A-E.*

*Choose the correct heading for each paragraph from the list of headings below.*

List of headings <b>i</b> Communication in music with animals <b>ii</b> New discoveries on animal music <b>iii</b> Music and language contrasted <b>iv</b> Current research on music	<b>v</b> Music is beneficial for infants. <b>vi</b> Music transcends cultures. <b>vii</b> Look back at some of the historical theories <b>viii</b> Are we genetically designed for music?
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### Section A

Music is one of the human species' relatively few universal abilities. Without formal training, any individual, from Stone Age tribesman to suburban teenager, has the ability to recognise music and, in some fashion, to make it. Why this should be so is a mystery. After all, music isn't necessary for getting through the day, and if it aids in reproduction, it does so only in highly indirect ways. Language, by contrast, is also everywhere - but for reasons that are more obvious. With language, you and the members of your tribe can organize a migration across Africa, build reed boats and cross the seas, and communicate at night even when you can't see each other. Modern culture, in all its technological extravagance, springs directly from the human talent for manipulating symbols and syntax. Scientists have always been intrigued by the connection between music and language. Yet over the years, words and melody have acquired a vastly different status in the lab and the seminar room. While language has long been considered essential to unlocking the mechanisms of human intelligence, music is generally treated as an evolutionary frippery - mere "auditory cheesecake", as the Harvard cognitive scientist Steven Pinker puts it.

### Section B

But thanks to a decade-long wave of neuroscience research, that tune is changing. A flurry of recent publications suggests that language and music may equally be able to tell us who we are and where we're from - not just emotionally, but biologically. In July, the journal *Nature Neuroscience* devoted a special issue to the topic. And in an article in the 6 August issue of the *Journal of Neuroscience*, David Schwartz, Catherine Howe, and Dale Purves of Duke University argued that the sounds of music and the sounds of language are intricately connected. To grasp the originality of this idea, it's necessary to realise two things about how music has traditionally been understood. First, musicologists have long emphasised that while each culture stamps a special identity onto its music, music itself has some universal qualities. For example, in virtually all cultures, sound is divided into some or all of the 12 intervals that make up the chromatic scale - that is, the scale represented by the keys on a piano. For centuries, observers have attributed this preference for certain combinations of tones to the mathematical properties of sound itself. Some 2,500 years ago, Pythagoras was the first to note a direct relationship between the harmoniousness of a tone combination and the physical dimensions of the object that produced it. For example, a plucked string will always play an octave lower than a similar string half its size, and a fifth lower than a similar string two thirds its length. This link between simple ratios and harmony has influenced music theory ever since.

### Section C

This music-is-math idea is often accompanied by the notion that music, formally speaking at least, exists apart from the world in which it was created. Writing recently in *The New York Review of Books*, pianist and critic Charles Rosen discussed the long-standing notion that while painting and sculpture reproduce at least some aspects of the natural world, and writing describes thoughts and feelings we are all familiar with, music is entirely abstracted from the world in which we live. Neither idea is right, according to David Schwartz and his colleagues. Human musical preferences are fundamentally shaped not by elegant algorithms or ratios but by the messy sounds of real life, and of speech in particular - which in turn is

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shaped by our evolutionary heritage. "The explanation of music, like the explanation of any product of the mind, must be rooted in biology, not in numbers per se," says Schwartz. Schwartz, Howe, and Purves analysed a vast selection of speech sounds from a variety of languages to reveal the underlying patterns common to all utterances. In order to focus only on the raw sounds, they discarded all theories about speech and meaning, and sliced sentences into random bites. Using a database of over 100,000 brief segments of speech, they noted which frequency had the greatest emphasis in each sound. The resulting set of frequencies, they discovered, corresponded closely to the chromatic scale. In short, the building blocks of music are to be found in speech. Far from being abstract, music presents a strange analogue to the patterns created by the sounds of speech. "Music, like visual arts, is rooted in our experience of the natural world," says Schwartz. "It emulates our sound environment in the way that visual arts emulate the visual environment." In music we hear the echo of our basic sound-making instrument - the vocal tract. The explanation for human music is simpler still than Pythagoras's mathematical equations: We like the sounds that are familiar to us - specifically, we like the sounds that remind us of us. This brings up some chicken-or-egg evolutionary questions. It may be that music imitates speech directly, the researchers say, in which case it would seem that language evolved first. It's also conceivable that music came first and language is in effect an imitation of song - that in everyday speech we hit the musical notes we especially like. Alternately, it may be that music imitates the general products of the human sound-making system, which just happens to be mostly speech. "We can't know this," says Schwartz. "What we do know is that they both come from the same system, and it is this that shapes our preferences."

### Section D

Schwartz's study also casts light on the long-running question of whether animals understand or appreciate music. Despite the apparent abundance of "music" in the natural world - birdsong, whalesong, wolf howls, synchronized chimpanzee hooting - previous studies have found that many laboratory animals don't show a great affinity for the human variety of music making. Marc Hauser and Josh McDermott of Harvard argued in the July issue of Nature Neuroscience that animals don't create or perceive music the way we do. The fact that laboratory monkeys can show recognition of human tunes is evidence, they say, of shared general features of the auditory system, not any specific chimpanzee musical ability. As for birds, those most musical beasts, they generally recognise their own tunes - a narrow repertoire - but don't generate novel melodies like we do. There are no avian Mozarts. But what's been played to animals, Schwartz notes, is human music. If animals evolve preferences for sound as we do - based upon the soundscape in which they live - then their "music" would be fundamentally different from ours. In the same way our scales derive from human utterances, a cat's idea of a good tune would derive from yowls and meows. To demonstrate that animals don't appreciate sound the way we do, we'd need evidence that they don't respond to "music" constructed from their own sound environment.

### Section E

No matter how the connection between language and music is parsed, what is apparent is that our sense of music, even our love for it, is as deeply rooted in our biology and in our brains as language is. This is most obvious with babies, says Sandra Trehub at the University of Toronto, who also published a paper in the Nature Neuroscience special issue. For babies, music and speech are on a continuum. Mothers use musical speech to "regulate infants' emotional states", Trehub says. Regardless of what language they speak, the voice all mothers use with babies is the same: "something between speech and song". This kind of communication "puts the baby in a trancelike state, which may proceed to sleep or extended periods of rapture". So if the babies of the world could understand the latest research on language and music, they probably wouldn't be very surprised. The upshot, says Trehub, is that music may be even more of a necessity than we realise.

## TEST 2 - Communicating Styles and Conflict

*The passage has seven paragraphs A-H.*

*Choose the correct heading for each paragraph from the list of headings below.*

List of headings

- i Summarising personality types
- ii Combined styles for workplace
- iii Physical explanation
- iv A lively person who encourages
- v Demanding and unsympathetic personality
- vi Lazy and careless personality
- vii The benefits of understanding communication styles
- viii Cautious and caring
- ix Factual and analytical personality
- x Self-assessment determines one's temperament

Knowing your communication style and having a mix of styles on your team can provide a positive force for resolving conflict.

**A.** As far back as Hippocrates' time (460-370B.C.), people have tried to understand other people by characterizing them according to personality type or temperament. Hippocrates believed there were four different body fluids that influenced four basic types of temperament. His work was further developed 500 years later by Galen. These days there are any number of self-assessment tools that relate to the basic descriptions developed by Galen, although we no longer believe the source to be the types of body fluid that dominate our systems.

**B.** The values in self-assessments that help determine personality style. Learning styles, communication styles, conflict-handling styles, or other aspects of individuals is that they help depersonalize conflict in interpersonal relationships. The depersonalization occurs when you realize that others aren't trying to be difficult, but they need different or more information than you do. They're not intending to be rude: they are so focused on the task they forget about greeting people. They would like to work faster but not at the risk of damaging the relationships needed to get the job done. They understand there is a job to do. But it can only be done right with the appropriate information, which takes time to collect. When used appropriately, understanding communication styles can help resolve conflict on teams. Very rarely are conflicts true personality issues. Usually they are issues of style, information needs, or focus.

**C.** Hippocrates and later Galen determined there were four basic temperaments: sanguine, phlegmatic, melancholic and choleric. These descriptions were developed centuries ago and are still somewhat apt, although you could update the wording. In today's world, they translate into the four fairly common communication styles described below:

**D.** The sanguine person would be the expressive or spirited style of communication. These people speak in pictures. They invest a lot of emotion and energy in their communication and often speak quickly. Putting their whole body into it. They are easily sidetracked onto a story that may or may not illustrate the point they are trying to make. Because of their enthusiasm, they are great team motivators. They are concerned about people and relationships. Their high levels of energy can come on strong at times and their focus is



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usually on the bigger picture, which means they sometimes miss the details or the proper order of things. These people find conflict or differences of opinion invigorating and love to engage in a spirited discussion. They love change and are constantly looking for new and exciting adventures.

**E.** The phlegmatic person - cool and persevering - translates into the technical or systematic communication style. This style of communication is focused on facts and technical details. Phlegmatic people have an orderly methodical way of approaching tasks, and their focus is very much on the task, not on the people, emotions, or concerns that the task may evoke. The focus is also more on the details necessary to accomplish a task. Sometimes the details overwhelm the big picture and focus needs to be brought back to the context of the task. People with this style think the facts should speak for themselves, and they are not as comfortable with conflict. They need time to adapt to change and need to understand both the logic of it and the steps involved.

**F.** The melancholic person who is soft hearted and oriented toward doing things for others translates into the considerate or sympathetic communication style. A person with this communication style is focused on people and relationships. They are good listeners and do things for other people-sometimes to the detriment of getting things done for themselves. They want to solicit everyone's opinion and make sure everyone is comfortable with whatever is required to get the job done. At times this focus on others can distract from the task at hand. Because they are so concerned with the needs of others and smoothing over issues, they do not like conflict. They believe that change threatens the status quo and tends to make people feel uneasy, so people with this communication style, like phlegmatic people need time to consider the changes in order to adapt to them.

**G.** The choleric temperament translates into the bold or direct style of communication. People with this style are brief in their communication – the fewer words the better. They are big picture thinkers and love to be involved in many things at once. They are focused on tasks and outcomes and often forget that the people involved in carrying out the tasks have needs. They don't do detail work easily and as a result can often underestimate how much time it takes to achieve the task. Because they are so direct, they often seem forceful and can be very intimidating to others. They usually would welcome someone challenging them. But most other styles are afraid to do so. They also thrive on change, the more the better.

**H.** A well-functioning team should have all of these communication styles for true effectiveness. All teams need to focus on the task, and they need to take care of relationships in order to achieve those tasks. They need the big picture perspective or the context of their work, and they need the details to be identified and taken care of for success. We all have aspects of each style within us. Some of us can easily move from one style to another and adapt our style to the needs of the situation at hand-whether the focus is on tasks or relationships. For others, a dominant style is very evident, and it is more challenging to see the situation from the perspective of another style. The work environment can influence communication styles either by the type of work that is required or by the predominance of one style reflected in that environment. Some people use one style at work and another at home. The good news about communication styles is that we have the ability to develop flexibility in our styles. The greater the flexibility we have, the more skilled we usually are at handling possible and actual conflicts. Usually it has to be relevant to us to do so, either because we think it is important or because there are incentives in our environment to encourage it. The key is that we have to want to become flexible with our communication style. As Henry Ford said, "Whether you think you can or you can't, you're right!"

## TEST 3 – New Zealand Seaweed

*Reading Passage has six sections A-F.*

*Choose the correct heading for each section from the list of headings below.*

List of headings

- i Locations and features of different seaweeds
- ii Various products of seaweeds
- iii Use of seaweeds in Japan
- iv Seaweed species around the globe
- v Nutritious value of seaweeds
- vi Why it doesn't dry or sink
- vii Where to find red seaweeds
- viii Underuse of native species
- ix Mystery solved
- x How seaweeds reproduce and grow

**Call us not weeds; we are flowers of the sea.**

### Section A

Seaweed is a particularly nutritious food, which absorbs and concentrates traces of a wide variety of minerals necessary to the body's health. Many elements may occur in seaweed - aluminium, barium, calcium, chlorine, copper, iodine and iron, to name but a few - traces normally produced by erosion and carried to the seaweed beds by river and sea currents. Seaweeds are also rich in vitamins: indeed, Eskimos obtain a high proportion of their bodily requirements of vitamin C from the seaweeds they eat. The nutritive value of seaweed has long been recognised. For instance, there is a remarkably low incidence of goitre amongst the Japanese, and for that matter, amongst our own Maori people, who have always eaten seaweeds, and this may well be attributed to the high iodine content of this food. Research into old Maori eating customs shows that jellies were made using seaweeds, fresh fruit and nuts, fuchsia and tutu berries, cape gooseberries, and many other fruits which either grew here naturally or were sown from seeds brought by settlers and explorers.

### Section B

New Zealand lays claim to approximately 700 species of seaweed, some of which have no representation outside this country. Of several species grown worldwide, New Zealand also has a particularly large share. For example, it is estimated that New Zealand has some 30 species of Gigartina, a close relative of carrageen or Irish moss. These are often referred to as the New Zealand carrageens. The gel-forming substance called agar which can be extracted from this species gives them great commercial application in seameal, from which seameal custard is made, and in cough mixture, confectionery, cosmetics, the canning, paint and leather industries, the manufacture of duplicating pads, and in toothpaste. In fact, during World War II, New Zealand Gigartina were sent to Australia to be used in toothpaste.

### Section C

Yet although New Zealand has so much of the commercially profitable red seaweeds, several of which are a source of agar (Pterocladia, Gelidium, Chondrus, Gigartina), before 1940 relatively little use was made of them. New Zealand used to import the Northern Hemisphere Irish moss (Chondrus crispus) from England and ready-made agar from Japan. Although distribution of the Gigartina is confined to certain areas according to species, it is only on the east coast of the North Island that its occurrence is rare. And even then, the east coast, and the area around Hokianga, have a considerable supply of the two species of

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Pterocladia from which agar is also available. Happily, New Zealandmade agar is now obtainable in health food shops.

### Section D

Seaweeds are divided into three classes determined by colour - red, brown and green - and each tends to live in a specific location. However, except for the unmistakable sea lettuce (*Ulva*), few are totally one colour; and especially when dry, some species can change colour quite significantly - a brown one may turn quite black, or a red one appear black, brown, pink or purple. Identification is nevertheless facilitated by the fact that the factors which determine where a seaweed will grow are quite precise, and they therefore tend to occur in very well-defined zones. Although there are exceptions, the green seaweeds are mainly shallow-water algae; the browns belong to medium depths, and the reds are plants of the deeper water. Flat rock surfaces near mid-level tides are the most usual habitat of sea bombs, Venus' necklace and most brown seaweeds. This is also the location of the purple laver or Maori karengo, which looks rather like a reddish-purple lettuce. Deep-water rocks on open coasts, exposed only at very low tide, are usually the site of bull kelp, strap weeds and similar tough specimens. Those species able to resist long periods of exposure to the sun and air are usually found on the upper shore, while those less able to stand such exposure occur nearer to or below the lowwater mark. Radiation from the sun, the temperature level, and the length of time immersed all play a part in the zoning of seaweeds.

### Section E

Propagation of seaweeds occurs by spores, or by fertilisation of egg cells. None have roots in the usual sense; few have leaves, and none have flowers, fruits or seeds. The plants absorb their nourishment through their fronds when they are surrounded by water: the base or "holdfast" of seaweeds is purely an attaching organ, not an absorbing one.

### Section F

Some of the large seaweeds maintain buoyancy with air-filled floats; others, such as bull kelp, have large cells filled with air. Some, which spend a good part of their time exposed to the air, often reduce dehydration either by having swollen stems that contain water, or they may (like Venus' necklace) have swollen nodules, or they may have distinctive shape like a sea bomb. Others, like the sea cactus, are filled with slimy fluid or have coating of mucilage on % the surface. In some of the larger kelps, this coating is not only to keep the plant moist but also to protect it from the violent action of waves.

## TEST 4 – REVIEW OF RESEARCH ON THE EFFECTS OF FOOD PROMOTION TO CHILDREN

*Reading Passage has seven paragraphs, A-G.*

*Choose the most suitable heading for paragraphs A-G from the list of headings below. Write the appropriate number, i-x, in boxes 1-7 on your answer sheet.*

List of Headings

- i** General points of agreements and disagreements of researchers
- ii** How much children really know about food
- iii** Need to take action
- iv** Advertising effects of the “Big Four”
- v** Connection of advertising and children’s weight problems
- vi** Evidence that advertising affects what children buy to eat
- vii** How parents influence children’s eating habits
- viii** Advertising’s focus on unhealthy options
- ix** Children often buy what they want
- x** Underestimating the effects advertising has on children

This review was commissioned by the Food Standards Agency to examine the current research evidence on:

- the extent and nature of food promotion to children
- the effect, if any, that this promotion has on their food knowledge, preferences and behaviour.

**A.** Children’s food promotion is dominated by television advertising, and the great majority of this promotes the so-called ‘Big Four’ of pre-sugared breakfast cereals, soft-drinks, confectionary and savoury snacks. In the last ten years advertising for fast food outlets has rapidly increased. There is some evidence that the dominance of television has recently begun to wane. The importance of strong, global branding reinforces a need for multi-faceted communications combining television with merchandising, ‘tie-ins’ and point of sale activity. The advertised diet contrasts sharply with that recommended by public health advisors, and themes of fun and fantasy or taste, rather than health and nutrition, are used to promote it to children. Meanwhile, the recommended diet gets little promotional support.

**B.** There is plenty of evidence that children notice and enjoy food promotion. However, establishing whether this actually influences them is a complex problem. The review tackled it by looking at studies that had examined possible effects on what children know about food, their food preferences, their actual food behaviour (both buying and eating), and their health outcomes (eg. obesity or cholesterol levels). The majority of studies examined food advertising, but a few examined other forms of food promotion. In terms of nutritional knowledge, food advertising seems to have little influence on children’s general perceptions of what constitutes a healthy diet, but, in certain contexts, it does have an effect on more specific types of nutritional knowledge. For example, seeing soft drink and cereal adverts reduced primary aged children’s ability to determine correctly whether or not certain products contained real fruit.

**C.** The review also found evidence that food promotion influences children’s food preferences and their purchase behaviour. A study of primary school children, for instance, found that exposure to advertising influenced which foods they claimed to like; and another showed that labelling and signage on a vending machine had an effect on what was bought by secondary school pupils. A number of studies have also shown that food advertising can influence what children eat. One, for example, showed that advertising influenced a primary class’s choice of daily snack at playtime.

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**D.** The next step, of trying to establish whether or not a link exists between food promotion and diet or obesity, is extremely difficult as it requires research to be done in real world settings. A number of studies have attempted this by using amount of television viewing as a proxy for exposure to television advertising. They have established a clear link between television viewing and diet, obesity, and cholesterol levels. It is impossible to say, however, whether this effect is caused by the advertising, the sedentary nature of television viewing or snacking that might take place whilst viewing. One study resolved this problem by taking a detailed diary of children's viewing habits. This showed that the more food adverts they saw, the more snacks and calories they consumed.

**E.** Thus the literature does suggest food promotion is influencing children's diet in a number of ways. This does not amount to proof; as noted above with this kind of research, incontrovertible proof simply isn't attainable. Nor do all studies point to this conclusion; several have not found an effect. In addition, very few studies have attempted to measure how strong these effects are relative to other factors influencing children's food choices. Nonetheless, many studies have found clear effects and they have used sophisticated methodologies that make it possible to determine that i) these effects are not just due to chance; ii) they are independent of other factors that may influence diet, such as parents' eating habits or attitudes; and iii) they occur at a brand and category level.

**F.** Furthermore, two factors suggest that these findings actually downplay the effect that food promotion has on children. First, the literature focuses principally on television advertising; the cumulative effect of this combined with other forms of promotion and marketing is likely to be significantly greater. Second, the studies have looked at direct effects on individual children, and understate indirect influences. For example, promotion for fast food outlets may not only influence the child, but also encourage parents to take them for meals and reinforce the idea that this is a normal and desirable behaviour.

**G.** This does not amount to proof of an effect, but in our view does provide sufficient evidence to conclude that an effect exists. The debate should now shift to what action is needed, and specifically to how the power of commercial marketing can be used to bring about improvements in young people's eating.



## TEST 5 – Accidental Scientists

Choose the correct letter, A, B, C or D.

Choose the most suitable heading for paragraphs A-G from the list of headings below.

List of Headings

- i Examples of some scientific discoveries
- ii Horace Walpole's fairy tale
- iii Resolving the contradiction
- iv What is the Scientific Method
- v The contradiction of views on scientific discovery
- vi Some misunderstandings of serendipity
- vii Opponents of authority
- viii Reality doesn't always match expectation
- ix How the word came into being
- x Illustration of serendipity in the business sector

**A.** A paradox lies close to the heart of scientific discovery. If you know just what you are looking for, finding it can hardly count as a discovery, since it was fully anticipated. But if, on the other hand, you have no notion of what you are looking for, you cannot know when you have found it, and discovery, as such, is out of the question. In the philosophy of science, these extremes map onto the purist forms of deductivism and inductivism: In the former, the outcome is supposed to be logically contained in the premises you start with; in the latter, you are recommended to start with no expectations whatsoever and see what turns up.

**B.** As in so many things, the ideal position is widely supposed to reside somewhere in between these two impossible-to-realise extremes. You want to have a good enough idea of what you are looking for to be surprised when you find something else of value, and you want to be ignorant enough of your end point that you can entertain alternative outcomes. Scientific discovery should, therefore, have an accidental aspect, but not too much of one. Serendipity is a word that expresses a position something like that. It's a fascinating word, and the late Robert King Merton—"the father of the sociology of science"—liked it well enough to compose its biography, assisted by the French cultural historian Elinor Barber.

**C.** The word did not appear in the published literature until the early 19<sup>th</sup> century and did not become well enough known to use without explanation until sometime in the first third of the 20<sup>th</sup> century. Serendipity means a "happy accident" or "pleasant surprise", specifically, the accident of finding something good or useful without looking for it. The first noted use of "serendipity" in the English language was by Horace Walpole. He explained that it came from the fairy tale, called *The Three Princes of Serendip* (the ancient name for Ceylon, or present day Sri Lanka), whose heroes "were always making discoveries, by accidents and sagacity, of things which they were not in quest of".

**D.** Antiquarians, following Walpole, found use for it, as they were always rummaging about for curiosities, and unexpected but pleasant surprises were not unknown to them. Some people just seemed to have a knack for that sort of thing, and serendipity was used to express that special capacity. The other community that came to dwell on serendipity to say something important about their practice was that of scientists, and here usages cut to the heart of the matter and were often vigorously contested. Many scientists, including the Harvard physiologist Walter Cannon and, later, the British immunologist Peter Medawar, liked to emphasise how much of scientific discovery was unplanned and even accidental. One of the examples is Hans Christian Orsted's discovery of electromagnetism when he unintentionally brought a current-carrying wire parallel to a

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magnetic needle. Rhetoric about the sufficiency of rational method was so much hot air. Indeed, as Medawar insisted, "There is no such thing as The Scientific Method," no way at all of systematising the process of discovery. Really important discoveries had a way of showing up when they had a mind to do so and not when you were looking for them. Maybe some scientists, like some book collectors, had a happy knack; maybe serendipity described the situation rather than a personal skill or capacity.

**E** Some scientists using the word meant to stress those accidents belonging to the situation; some treated serendipity as a personal capacity; many others exploited the ambiguity of the notion. Yet what Cannon and Medawar took as a benign nose-thumbing at Dreams of Method, other scientists found incendiary. To say that science had a significant serendipitous aspect was taken by some as dangerous denigration. If scientific discovery were really accidental, then what was the special basis of expert authority? In this connection, the aphorism of choice came from no less an authority on scientific discovery than Louis Pasteur: "Chance favors the prepared mind." Accidents may happen, and things may turn up unplanned and unforeseen, as one is looking for something else, but the ability to notice such events, to see their potential bearing and meaning, to exploit their occurrence and make constructive use of them—these are the results of systematic mental preparation. What seems like an accident is just another form of expertise. On closer inspection, it is insisted, accident dissolves into sagacity.

**F.** The context in which scientific serendipity was most contested and had its greatest resonance was that connected with the idea of planned science. The serendipitists were not all inhabitants of academic ivory towers. As Merton and Barber note, two of the great early-20th-century American pioneers of industrial research—Willis Whitney and Irving Langmuir, both of General Electric—made much play of serendipity, in the course of arguing against overly rigid research planning. Langmuir thought that misconceptions about the certainty and rationality of the research process did much harm and that a mature acceptance of uncertainty was far more likely to result in productive research policies. For his own part, Langmuir said that satisfactory outcomes "occurred as though we were just drifting with the wind. These things came about by accident." If there is no very determinate relationship between cause and effect in research, he said, "then planning does not get us very far." So, from within the bowels of corporate capitalism came powerful arguments, by way of serendipity, for scientific spontaneity and autonomy. The notion that industry was invariably committed to the regimentation of scientific research just doesn't wash.

**G.** For Merton himself—who one supposes must have been the senior author—serendipity represented the keystone in the arch of his social scientific work. In 1936, as a very young man, Merton wrote a seminal essay on "The Unanticipated Consequences of Purposive Social Action." It is, he argued, the nature of social action that what one intends is rarely what one gets: Intending to provide resources for buttressing Christian religion, the natural philosophers of the Scientific Revolution laid the groundwork for secularism; people wanting to be alone with nature in Yosemite Valley wind up crowding one another. We just don't know enough—and we can never know enough to ensure that the past is an adequate guide to the future: Uncertainty about outcomes, even of our best-laid plans, is endemic. All social action, including that undertaken with the best evidence and formulated according to the most rational criteria, is uncertain in its consequences.

## TEST 6 - Wealth in A Cold Climate

*Reading Passage has seven paragraphs, A-G.*

*Choose the most suitable heading for paragraphs A-G from the list of headings below.*

List of Headings

- i** The positive correlation between climate and wealth
- ii** Other factors besides climate that influence wealth
- iii** Inspiration from reading a book
- iv** Other researchers' results do not rule out exceptional cases
- v** Different attributes between Eurasia and Africa
- vi** Low temperature benefits people and crops
- vii** The importance of institution in traditional views
- viii** The spread of crops in Europe, Asia and other places
- ix** The best way to use aid
- x** Confusions and exceptions

Latitude is crucial to a nation's economic strength.

**A.** Dr William Masters was reading a book about mosquitoes when inspiration struck. "There was this anecdote about the great yellow fever epidemic that hit Philadelphia in 1793," Masters recalls. "This epidemic decimated the city until the first frost came." The inclement weather froze out the insects, allowing Philadelphia to recover.

**B.** If weather could be the key to a city's fortunes, Masters thought, then why not to the historical fortunes of nations? And could frost lie at the heart of one of the most enduring economic mysteries of all—why are almost all the wealthy, industrialised nations to be found at latitudes above 40 degrees? After two years of research, he thinks that he has found a piece of the puzzle. Masters, an agricultural economist from Purdue University in Indiana, and Margaret McMillan at Tufts University, Boston, show that annual frosts are among the factors that distinguish rich nations from poor ones. Their study is published this month in the *Journal of Economic Growth*. The pair speculate that cold snaps have two main benefits - they freeze pests that would otherwise destroy crops, and also freeze organisms, such as mosquitoes, that carry disease. The result is agricultural abundance and a big workforce.

**C.** The academics took two sets of information. The first was average income for countries, the second climate data from the University of East Anglia. They found a curious tally between the sets. Countries having five or more frosty days a month are uniformly rich, those with fewer than five are impoverished. The authors speculate that the five-day figure is important; it could be the minimum time needed to kill pests in the soil. Masters says: "For example, Finland is a small country that is growing quickly, but Bolivia is a small country that isn't growing at all. Perhaps climate has something to do with that." In fact, limited frosts bring huge benefits to farmers. The chills kill insects or render them inactive; cold weather slows the break-up of plant and animal material in the soil, allowing it to become richer; and frosts ensure a build-up of moisture in the ground for spring, reducing dependence on seasonal rains. There are exceptions to the "cold equals rich" argument. There are well-heeled tropical places such as Hong Kong and Singapore, a result of their superior trading positions. Like-wise, not all European countries are moneyed in the former communist colonies, economic potential was crushed by politics.

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**D.** Masters stresses that climate will never be the overriding factor - the wealth of nations is too complicated to be attributable to just one factor. Climate, he feels, somehow combines with other factors such as the presence of institutions, including governments, and access to trading routes to determine whether a country will do well. Traditionally, Masters says, economists thought that institutions had the biggest effect on the economy, because they brought order to a country in the form of, for example, laws and property rights. With order, so the thinking went, came affluence. "But there are some problems that even countries with institutions have not been able to get around," he says. "My feeling is that, as countries get richer, they get better institutions. And the accumulation of wealth and improvement in governing institutions are both helped by a favourable environment, including climate."

**E.** This does not mean, he insists, that tropical countries are beyond economic help and destined to remain penniless. Instead, richer countries should change the way in which foreign aid is given. Instead of aid being geared towards improving governance, it should be spent on technology to improve agriculture and to combat disease. Masters cites one example: "There are regions in India that have been provided with irrigation, agricultural productivity has gone up and there has been an improvement in health." Supplying vaccines against tropical diseases and developing crop varieties that can grow in the tropics would break the poverty cycle.

**F.** Other minds have applied themselves to the split between poor and rich nations, citing anthropological, climatic and zoological reasons for why temperate nations are the most affluent. In 350 BC, Aristotle observed that "those who live in a cold climate...are full of spirit". Jared Diamond, from the University of California at Los Angeles, pointed out in his book *Guns, Germs and Steel* that Eurasia is broadly aligned east-west, while Africa and the Americas are aligned north-south. So, in Europe, crops can spread quickly across latitudes because climates are similar. One of the first domesticated crops, einkorn wheat, spread quickly from the Middle East into Europe; it took twice as long for corn to spread from Mexico to what is now the eastern United States. This easy movement along similar latitudes in Eurasia would also have meant a faster dissemination of other technologies such as the wheel and writing, Diamond speculates. The region also boasted domesticated livestock, which could provide meat, wool and motive power in the fields. Blessed with such natural advantages, Eurasia was bound to take off economically.

**G.** John Gallup and Jeffrey Sachs, two US economists, have also pointed out striking correlations between the geographical location of countries and their wealth. They note that tropical countries between 23.45 degrees north and south of the equator are nearly all poor. In an article for the *Harvard International Review*, they concluded that "development surely seems to favour the temperate-zone economies, especially those in the northern hemisphere, and those that have managed to avoid both socialism and the ravages of war". But Masters cautions against geographical determinism, the idea that tropical countries are beyond hope: "Human health and agriculture can be made better through scientific and technological research," he says, "so we shouldn't be writing off these countries. Take Singapore: without air conditioning, it wouldn't be rich."

## TEST 7 – Morse Code

Reading passage has eight paragraphs, A-H.

Choose the correct heading for paragraphs A-H from the list of headings

### List of Headings

- i The advantage of Morse's invention
- ii A suitable job for women
- iii Morse's invention was developed
- iv Sea rescue after the invention of radiotelegraphy
- v The emergence of many job opportunities
- vi Standard and variations
- vii Application of Morse code in a new technology
- viii The discovery of electricity
- ix International expansion of Morse Code
- x The beginning of an end
- xi The move of using code to convey information

Morse code is being replaced by a new satellite-based system for sending distress calls at sea. Its dots and dashes have had a good run for their money.

**A.** "Calling all. This is our last cry before our eternal silence." Surprisingly this message, which flashed over the airwaves in the dots and dashes of Morse code on January 31st 1997, was not a desperate transmission by a radio operator on a sinking ship. Rather, it was a message signalling the end of the use of Morse code for distress calls in French waters. Since 1992 countries around the world have been decommissioning their Morse equipment with similar (if less poetic) sign-offs, as the world's shipping switches over to a new satellite-based arrangement, the Global Maritime Distress and Safety System. The final deadline for the switch-over to GMDSS is February 1st, a date that is widely seen as the end of an era.

**B.** The code has, however, had a good history. Appropriately for a technology commonly associated with radio operators on sinking ships, the idea of Morse code is said to have occurred to Samuel Morse while he was on board a ship crossing the Atlantic. At the time Morse was a painter and occasional inventor, but when another of the ship's passengers informed him of recent advances in electrical theory, Morse was suddenly taken with the idea of building an electric telegraph to send messages in codes. Other inventors had been trying to do just that for the best part of a century. Morse succeeded and is now remembered as "the father of the telegraph" partly thanks to his singlemindedness it was 12 years, for example, before he secured money from Congress to build his first telegraph line—but also for technical reasons.

**C.** Compared with rival electric telegraph designs, such as the needle telegraph developed by William Cooke and Charles Wheatstone in Britain, Morse's design was very simple: it required little more than a "key" (essentially, a springloaded switch) to send messages, a clicking "sounder" to receive them, and a wire to link the two. But although Morse's hardware was simple, there was a catch: in order to use his equipment, operators had to learn the special code of dots and dashes that still bears his name. Originally, Morse had not intended to use combinations of dots and dashes to represent individual letters. His first code, sketched in his notebook during that transatlantic voyage, used dots and dashes to represent the digits 0 to 9. Morse's idea was that messages would consist of strings of numbers corresponding to words and phrases in a special numbered dictionary. But Morse later abandoned this scheme and, with the help of an associate, Alfred Vail, devised the Morse alphabet, which could be used to spell out messages a letter at a time in dots and dashes.



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**D.** At first, the need to learn this complicated-looking code made Morse's telegraph seem impossibly tricky compared with other, more user-friendly designs. Cooke and Wheatstone's telegraph, for example, used five needles to pick out letters on a diamond-shaped grid. But although this meant that anyone could use it, it also required five wires between telegraph stations. Morse's telegraph needed only one. And some people, it soon transpired, had a natural facility for Morse code.

**E.** As electric telegraphy took off in the early 1850s, the Morse telegraph quickly became dominant. It was adopted as the European standard in 1851, allowing direct connections between the telegraph networks of different countries. (Britain chose not to participate, sticking with needle telegraphs for a few more years.) By this time Morse code had been revised to allow for accents and other foreign characters, resulting in a split between American and International Morse that continues to this day.

**F.** On international submarine cables, left and right swings of a light-beam reflected from a tiny rotating mirror were used to represent dots and dashes. Meanwhile a distinct telegraphic sub-culture was emerging, with its own customs and vocabulary, and a hierarchy based on the speed at which operators could send and receive Morse code. First-class operators, who could send and receive at speeds of up to 45 words a minute, handled press traffic, securing the best-paid jobs in big cities. At the bottom of the pile were slow, inexperienced rural operators, many of whom worked the wires as part-timers. As their Morse code improved, however, rural operators found that their newfound skill was a passport to better pay in a city job. Telegraphers soon swelled the ranks of the emerging middle classes. Telegraphy was also deemed suitable work for women. By 1870, a third of the operators in the Western Union office in New York, the largest telegraph office in America, were female.

**G.** In a dramatic ceremony in 1871, Morse himself said goodbye to the global community of telegraphers he had brought into being. After a lavish banquet and many adulatory speeches, Morse sat down behind an operators table and, placing his finger on a key connected to every telegraph wire in America, tapped out his final farewell to a standing ovation. By the time of his death in 1872, the world was well and truly wired: more than 650,000 miles of telegraph line and 30,000 miles of submarine cable were throbbing with Morse code; and 20,000 towns and villages were connected to the global network. Just as the Internet is today often called an "information superhighway", the telegraph was described in its day as an "instantaneous highway of thought",

**H.** But by the 1890s the Morse telegraph's heyday as a cutting-edge technology was coming to an end, with the invention of the telephone and the rise of automatic telegraphs, precursors of the teleprinter, neither of which required specialist skills to operate. Morse code, however, was about to be given a new lease of life thanks to another new technology: wireless. Following the invention of radiotelegraphy by Guglielmo Marconi in 1896, its potential for use at sea quickly became apparent. For the first time, ships could communicate with each other, and with the shore, whatever the weather and even when out of visual range. In 1897 Marconi successfully sent Morse code messages between a shore station and an Italian warship 19km (12 miles) away. By 1910, Morse radio equipment was commonplace on ships.

## TEST 8 – Saving the British Bitterns

*The reading passage has seven paragraphs, A-H.*

*Choose the correct heading for paragraphs A-H from the list below.*

### List of Headings

- i** research findings into habitats and decisions made
- ii** fluctuation in bittern number
- iii** protect the young bittern
- iv** international cooperation works
- v** Began in calculation of the number
- vi** importance of food
- vii** Research has been successful.
- viii** research into the reedbed
- ix** reserve established holding bittern in winter

**A .** Breeding bitterns became extinct in the UK by 1886 but, following recolonization early last century, numbers rose to a peak of about 70 booming (singing) males in the 1950s, falling to fewer than 20 by the 1990s. In the late 1980s it was clear that the bittern was in trouble, but there was little information on which to base recovery actions.

**B.** Bitterns have cryptic plumage and a shy nature, usually remaining hidden within the cover of reed bed vegetation. Our first challenge was to develop standard methods to monitor their numbers. The boom of the male bittern is its most distinctive feature during the breeding season, and we developed a method to count them using the sound patterns unique to each individual. This not only allows us to be much more certain of the number of booming males in the UK, but also enables us to estimate local survival of males from one year to the next

**C.** Our first direct understanding of the habitat needs of breeding bitterns came from comparisons of reed bed sites that had lost their booming birds with those that retained them. This research showed that bitterns had been retained in reed beds where the natural process of succession, or drying out, had been slowed through management. Based on this work, broad recommendations on how to manage and rehabilitate reed beds for bitterns were made, and funding was provided through the EU LIFE Fund to manage 13 sites within the core breeding range. This project, though led by the RSPB, involved many other organisations.

**D.** To refine these recommendations and provide fine-scale, quantitative habitat prescriptions on the bitterns preferred feeding habitat, we radiotracked male bitterns on the RSPB's Minsmere and Leighton Moss reserves. This showed clear preferences for feeding in the wetter reed bed margins, particularly within the reed bed next to larger open pools. The average home range sizes of the male bitterns we followed (about 20 hectares) provided a good indication of the area of reed bed needed when managing or creating habitat for this species. Female bitterns undertake all the incubation and care of the young, so it was important to understand their needs as well. Over the course of our research, we located 87 bittern nests and found that female bitterns preferred to nest in areas of continuous vegetation, well into the reed bed, but where water was still present during the driest part of the breeding season.

**E.** The success of the habitat prescriptions developed from this research has been spectacular. For instance, at Minsmere, booming bittern numbers gradually increased from one to 10 following reed bed lowering, a management technique designed to halt the drying out process. After a low point of 11 booming males in 1997, bittern numbers in Britain responded to all the habitat management work and started to increase for the first time since the 1950s.

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**F.** The final phase of research involved understanding the diet, survival and dispersal of bittern chicks. To do this we fitted small radio tags to young bittern chicks in the nest, to determine their fate through to fledging and beyond. Many chicks did not survive to fledging and starvation was found to be the most likely reason for their demise. The fish prey fed to chicks was dominated by those species penetrating into the reed edge. So, an important element of recent studies (including a PhD with the University of Hull) has been the development of recommendations on habitat and water conditions to promote healthy native fish populations

**G.** Once independent, radio-tagged young bitterns were found to seek out new sites during their first winter; a proportion of these would remain on new sites to breed if the conditions were suitable. A second EU LIFE funded project aims to provide these suitable sites in new areas. A network of 19 sites developed through this partnership project will secure a more sustainable UK bittern population with successful breeding outside of the core area, less vulnerable to chance events and sea level rise.

**H.** By 2004, the number of booming male bitterns in the UK had increased to 55, with almost all of the increase being on those sites undertaking management based on advice derived from our research. Although science has been at the core of the bittern story, success has only been achieved through the trust, hard work and dedication of all the managers, owners and wardens of sites that have implemented, in some cases very drastic, management to secure the future of this wetland species in the UK. The constructed bunds and five major sluices now control the water level over 82 ha, with a further 50 ha coming under control in the winter of 2005/06. Reed establishment has principally used natural regeneration or planted seedlings to provide small core areas that will in time expand to create a bigger reed area. To date nearly 275,000 seedlings have been planted and reed cover is extensive. Over 3 km of new ditches have been formed, 3.7 km of existing ditch have been reprofiled and 2.2 km of old meander (former estuarine features) has been cleaned out.

**I.** Bitterns now regularly winter on the site some indication that they are staying longer into the spring. No breeding has yet occurred but a booming male was present in the spring of 2004. A range of wildfowl breed, as well as a good number of reed bed passerines including reed bunting, reed, sedge and grasshopper warblers. Numbers of wintering shoveler have increased so that the site now holds a UK important wintering population. Malltraeth Reserve now forms part of the UK network of key sites for water vole (a UK priority species) and 12 monitoring transects has been established. Otter and brown-hare occur on the site as does the rare plant. Pillwort.

## TEST 9 – Corporate Social Responsibility

Reading passage has seven paragraphs, A–G

Choose the correct heading for each paragraph from the list of heading below.

### List of Headings

- i** How CSR may help one business to expand
- ii** CSR in many aspects of a company's business
- iii** A CSR initiative without a financial gain
- iv** Lack of action by the state of social issues
- v** Drives or pressures motivate companies to address CSR
- vi** The past illustrates business are responsible for future outcomes
- vii** Companies applying CSR should be selective
- viii** Reasons that business and society benefit each other

**A.** An excellent definition was developed in the 1980s by Norwegian Prime Minister Gro Harlem Brundtland and used by the World Business Council for Sustainable Development: “Meeting the needs of the present without compromising the ability of future generations to meet their own needs.” Nowadays, governments and companies need to account for the social consequences of their actions. As a result, corporate social responsibility (CSR) has become a priority for business leaders around the world. When a well-run business applies its vast resources and expertise to social problems that it understands and in which it has a stake, it can have a greater impact than any other organization. The notion of license to operate derives from the fact that every company needs tacit or explicit permission from governments, communities, and numerous other stakeholders to justify CSR initiatives to improve a company's image, strengthen its brand, enliven morale and even raise the value of its stock.

**B.** To advance CSR, we must root it in a broad understanding of the interrelationship between a corporation and society. Successful corporations need a healthy society. Education, health care, and equal opportunity are essential to a productive workforce. Safe products and working conditions not only attract customers but lower the internal costs of accidents. Efficient utilization of land, water, energy, and other natural resources makes business more productive. Good government, the rule of law, and property rights are essential for efficiency and innovation. Strong regulatory standards protect both consumers and competitive companies from exploitation. Ultimately, a healthy society creates expanding demand for business, as more human needs are met and aspirations grow. Any business that pursues its ends at the expense of the society in which it operates will find its success to be illusory and ultimately temporary. At the same time, a healthy society needs successful companies. No social program can rival the business sector when it comes to creating the jobs, wealth, and innovation that improve standards of living and social conditions over time.

**C.** A company's impact on society also changes over time, as social standards evolve and science progresses. Asbestos, now understood as a serious health risk was thought to be safe in the early 1900s, given the scientific knowledge then available. Evidence of its risks gradually mounted for more than 50 years before any company was held liable for the harms it can cause. Many firms that failed to anticipate the consequences of this evolving body of research have been bankrupted by the results. No longer can companies be content to monitor only the obvious social impacts of today. Without a careful process for identifying evolving social effects of tomorrow, firms may risk their very survival.

**D.** No business can solve all of society's problems or bear the cost of doing so. Instead, each company must select issues that intersect with its particular business. Other social agendas are best left to those companies in other industries, NGOs, or government institutions that are better positioned to address them. The

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essential test that should guide CSR is not whether a cause is worthy but whether it presents an opportunity to create shared value – that is, a meaningful benefit for society that is also valuable to the business. Each company can identify the particular set of societal problems that it is best equipped to help resolve and from which it can gain the greatest competitive benefit.

**E.** The best corporate citizenship initiatives involve far more than writing a check: They specify clear, measurable goals and track results over time. A good example is General Electronics's program to adopt underperforming public high schools near several of its major U.S. facilities. The company contributes between \$250,000 and \$1 million over a five-year period to each school and makes in-kind donations as well. GE managers and employees take an active role by working with school administrators to assess needs and mentor or tutor students. In an independent study of 10 schools in the program between 1989 and 1999, nearly all showed significant improvement, while the graduation rate in four of the five worst performing schools doubled from an average of 30% to 60%. Effective corporate citizenship initiatives such as this one create goodwill and improve relations with local governments and other important constituencies. What's more, GE's employees feel great pride in their participation. Their effect is inherently limited, however. No matter how beneficial the program is, it remains incidental to the company's business, and the direct effect on GE's recruiting and retention is modest.

**F.** Microsoft's Working Connections partnership with the American Association of Community Colleges (AACC) is a good example of a shared-value opportunity arising from investments in context. The shortage of information technology workers is a significant constraint on Microsoft's growth; currently, there are more than 450,000 unfilled IT positions in the United States alone. Community colleges, with an enrollment of 11.6 million students, representing 45% of all U.S. undergraduates, could be a major solution. Microsoft recognizes, however, that community colleges face special challenges: IT curricula are not standardized, technology used in classrooms is often outdated, and there are no systematic professional development programs to keep faculty up to date. Microsoft's \$50 million five-year initiative was aimed at all three problems. In addition to contributing money and products, Microsoft sent employee volunteers to colleges to assess needs, contribute to curriculum development, and create faculty development institutes. Microsoft has achieved results that have benefited many communities while having a direct-and potentially significant-impact on the company.

**G.** At the heart of any strategy is a unique value proposition: a set of needs a company can meet for its chosen customers that others cannot. The most strategic CSR occurs when a company adds a social dimension to its value proposition, making social impact integral to the overall strategy. Consider Whole Foods Market, whose value proposition is to sell organic, natural, and healthy food products to customers who are passionate about food and the environment. The company's sourcing emphasizes purchases from local farmers through each store's procurement process. Buyers screen out foods containing any of nearly 100 common ingredients that the company considers unhealthy or environmentally damaging. The same standards apply to products made internally. Whole Foods' commitment to natural and environmentally friendly operating practices extends well beyond sourcing. Stores are constructed using a minimum of virgin raw materials. Recently, the company purchased renewable wind energy credits equal to 100% of its electricity use in all of its stores and facilities, the only Fortune 500 company to offset its electricity consumption entirely. Spoiled produce and biodegradable waste are trucked to regional centers for composting. Whole Foods' vehicles are being converted to run on biofuels. Even the cleaning products used in its stores are environmentally friendly. And through its philanthropy, the company has created the Animal Compassion Foundation to develop more natural and humane ways of raising farm animals. In short, nearly every aspect of the company's value chain reinforces the social dimensions of its value proposition, distinguishing Whole Foods from its competitors.



## TEST 10 – Art Artists Liars

Reading Passage has six paragraphs, A-F.

Choose the correct heading for each paragraph from the list of headings below.

### List of Headings

- i** Unsuccessful deceit
- ii** Biological basis between liars and artists
- iii** How to lie in an artistic way
- iv** Confabulations and the exemplifiers
- v** The distinction between artists and common liars
- vi** The fine line between liars and artists
- vii** The definition of confabulation
- viii** Creativity when people lie

**A.** Shortly before his death, Marlon Brando was working on a series of instructional videos about acting, to he called "Lying for a living". On the surviving footage, Brando can he seen dispensing gnomonic advice on his craft to a group of enthusiastic, if somewhat bemused, Hollywood stars, including Leonardo Di Caprio and Sean Penn. Brando also recruited random people from the Los Angeles street and persuaded them to improvise (the footage is said to include a memorable scene featuring two dwarves and a giant Samoan). "If you can lie, you can act." Brando told Jod Kaftan, a writer for Rolling Stone and one of the few people to have viewed the footage. "Are you good at lying?" asked Kaftan. "Jesus." said Brando, "I'm fabulous at it".

**B.** Brando was not the first person to note that the line between an artist and a liar is a line one. If art is a kind of lying, then lying is a form of art, albeit of a lower order-as Oscar Wilde and Mark Twain have observed. Indeed, lying and artistic storytelling spring from a common neurological root-one that is exposed in the cases of psychiatric patients who suffer from a particular kind of impairment. Both liars and artists refuse to accept the tyranny of reality. Both carefully craft stories that are worthy of belief - a skill requiring intellectual sophistication, emotional sensitivity and physical self-control (liars are writers and performers of their own work). Such parallels are hardly coincidental, as I discovered while researching my book on lying.

**C.** A case study published in 1985 by Antonio Damasio, a neurologist, tells the story of a middle-aged woman with brain damage caused by a series of strokes. She retained cognitive abilities, including coherent speech, but what she actually said was rather unpredictable. Checking her knowledge of contemporary events, Damasio asked her about the Falklands War. In the language of psychiatry, this woman was "confabulating". Chronic confabulation is a rare type of memory problem that affects a small proportion of brain damaged people. In the literature it is defined as "the production of fabricated, distorted or misinterpreted memories about oneself or the world, without the conscious intention to deceive". Whereas amnesiacs make errors of omission, there are gaps in their recollections they find impossible to fill – confabulators make errors of commission: they make tilings up. Rather than forgetting, they are inventing. Confabulating patients are nearly always oblivious to their own condition, and will earnestly give absurdly implausible explanations of why they're in hospital, or talking to a doctor. One patient, asked about his surgical sear, explained that during the Second World War he surprised a teenage girl who shot him three times in the head, killing him, only for surgery to bring him back to life. The same patient, when asked about his family, described how at various times they had died in his arms, or had been killed before his eyes. Others tell yet more fantastical tales, about trips to the moon, fighting alongside Alexander in India or seeing Jesus on the Cross. Confabulators aren't out to deceive. They engage in what Morris Moseovitch, a neuropsychologist, calls "honest lying". Uncertain and obscurely distressed by their uncertainty, they are

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seized by a “compulsion to narrate”: a deep-seated need to shape, order and explain what they do not understand. Chronic confabulators are often highly inventive at the verbal level, jamming together words in nonsensical but suggestive ways: one patient, when asked what happened to Queen Marie Antoinette of France, answered that she had been “suicided” by her family. In a sense, these patients are like novelists, as described by Henry James: people on whom “nothing is wasted”. Unlike writers, however, they have little or no control over their own material.

**D.** The wider significance of this condition is what it tells us about ourselves. Evidently, there is a gushing river of verbal creativity in the normal human mind, from which both artistic invention and lying are drawn. We are born storytellers, spinning, narrative out of our experience and imagination, straining against the leash that keeps us tethered to reality. This is a wonderful thing; it is what gives us our ability to conceive of alternative futures and different worlds. And it helps us to understand our own lives through the entertaining stories of others. But it can lead us into trouble, particularly when we try to persuade others that our inventions are real. Most of the time, as our stories bubble up to consciousness, we exercise our cerebral censors, controlling which stories we tell, and to whom. Yet people lie for all sorts of reasons, including the fact that confabulating can be dangerously fun.

**E.** During a now-famous libel case in 1996, Jonathan Aitken, a former cabinet minister, recounted a tale to illustrate the horrors he endured after a national newspaper tainted his name. The case, which stretched on for more than two years, involved a series of claims made by the Guardian about Aitken's relationships with Saudi arms dealers, including meetings he allegedly held with them on a trip to Paris while he was a government minister. What amazed many in hindsight was the sheer superfluity of the lies Aitken told during his testimony. Aitken's case collapsed in June 1997, when the defence finally found indisputable evidence about his Paris trip. Until then, Aitken's charm, fluency and flair for theatrical displays of sincerity looked as if they might bring him victory, they revealed that not only was Aitken's daughter not with him that day (when he was indeed doorstepped), but also that the minister had simply got into his car and drove off, with no vehicle in pursuit.

**F.** Of course, unlike Aitken, actors, playwrights and novelists are not literally attempting to deceive us, because the rules are laid out in advance: come to the theatre, or open this book, and we'll lie to you. Perhaps this is why we fell it necessary to invent art in the first place: as a safe space into which our lies can be corralled, and channeled into something socially useful. Given the universal compulsion to tell stories, art is the best way to refine and enjoy the particularly outlandish or insight till ones. But that is not the whole story. The key way in which artistic “lies” differ from normal lies, and from the “honest lying” of chronic confabulators, is that they have a meaning and resonance beyond their creator. The liar lies on behalf of himself; the artist tell lies on behalf of everyone. If writers have a compulsion to narrate, they compel themselves to find insights about the human condition. Mario Vargas Llosa has written that novels “express a curious truth that can only be expressed in a furtive and veiled fashion, masquerading as what it is not.” Art is a lie whose secret ingredient is truth.

# MATCHING SENTENCE ENDINGS

## Mini warm-up practice test – Match Sentence Endings

Complete each sentence with the correct ending A-H.

1. Brice Pitt believes	A material wealth doesn't necessarily create happiness.
2. The research at Henley Centre discovers	B optimists tend to be unrealistic about human evolution.
3. The study conducted by Adweek finds	C optimism is advantageous for human evolution.
4. The Annual Review of Clinical Psychology reports	D adversity is the breeding ground of resilience.
5. Steven Stack says in his report	E feelings of optimism vary according to gender.
	F good humour means good flexibility.
	G evenness of mind under stress is important to building resilience.
	H having an optimistic outlook is a habit.

### Optimism and Health

**Mindset is all. How you start the year will set the template for the rest, and two scientifically backed character traits hold the key: optimism and resilience (if the prospect leaves you feeling pessimistically spineless, the good news is that you can significantly boost both of these qualities).**

Faced with 12 months of plummeting economics and rising human distress, staunchly maintaining a rosy view might seem deludedly Pollyannaish. But here we encounter the optimism paradox. As Brice Pitt, an emeritus professor of the psychiatry of old age at Imperial College, London, told me: “Optimists are unrealistic. Depressive people see things as they really are, but that is a disadvantage from an evolutionary point of view. Optimism is a piece of evolutionary equipment that carried us through millennia of setbacks.” Optimists have plenty to be happy about. In other words, if you can convince yourself that things will get better, the odds of it happening will improve because you keep on playing the game. In this light, optimism “is a habitual way of explaining your setbacks to yourself”, reports Martin Seligman, the psychology professor and author of *Learned Optimism*. The research shows that when times get tough, optimists do better than pessimists - they succeed better at work, respond better to stress, suffer fewer depressive episodes, and achieve more personal goals.

Studies also show that belief can help with the financial pinch. Chad Wallens, a social forecaster at the Henley Centre who surveyed middle-class Britons' beliefs about income, has found that “the people who feel wealthiest, and those who feel poorest, actually have almost the same amount of money at their disposal. Their attitudes and behaviour patterns, however, are different from one another.”

Optimists have something else to be cheerful about - in general, they are more robust. For example, a study of 660 volunteers by the Yale University psychologist Dr. Becca Levy found that thinking positively adds an average of seven years to your life. Other American research claims to have identified a physical mechanism behind this. A Harvard Medical School study of 670 men found that the optimists have significantly better lung function. The lead author, Dr. Rosalind Wright, believes that attitude somehow strengthens the immune system. “Preliminary studies on heart patients suggest that, by changing a person's outlook, you can improve their mortality risk,” she says.

Few studies have tried to ascertain the proportion of optimists in the world. But a 1995 nationwide survey conducted by the American magazine *Adweek* found that about half the population counted

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themselves as optimists, with women slightly more apt than men (53 per cent versus 48 per cent) to see the sunny side.

Of course, there is no guarantee that optimism will insulate you from the crunch's worst effects, but the best strategy is still to keep smiling and thank your lucky stars. Because (as every good sports coach knows) adversity is character-forming - so long as you practise the skills of resilience. Research among tycoons and business leaders shows that the path to success is often littered with failure: a record of sackings, bankruptcies and blistering castigation. But instead of curling into a foetal ball beneath the coffee table, they resiliently pick themselves up, learn from their pratfalls and march boldly towards the next opportunity.

The American Psychological Association defines resilience as the ability to adapt in the face of adversity, trauma or tragedy. A resilient person may go through difficulty and uncertainty, but he or she will doggedly bounce back. Optimism is one of the central traits required in building resilience, say Yale University investigators in the Annual Review of Clinical Psychology. They add that resilient people learn to hold on to their sense of humour and this can help them to keep a flexible attitude when big changes of plan are warranted. The ability to accept your lot with equanimity also plays an important role, the study adds.

One of the best ways to acquire resilience is through experiencing a difficult childhood, the sociologist Steven Stack reports in the Journal of Social Psychology. For example, short men are less likely to commit suicide than tall guys, he says, because shorties develop psychological defence skills to handle the bullies and mickey-taking that their lack of stature attracts. By contrast, those who enjoyed adversity-free youths can get derailed by setbacks later on because they've never been inoculated against aggro. If you are handicapped by having had a happy childhood, then practicing proactive optimism can help you to become more resilient. Studies of resilient people show that they take more risks; 'they court failure and learn not to fear it.

And despite being thick-skinned, resilient types are also more open than average to other people. Bouncing through knock-backs is all part of the process. It's about optimistic risk-taking - being confident that people will like you. Simply smiling and being warm to people can help. It's an altruistic path to self-interest and if it achieves nothing else, it will reinforce an age-old adage: hard times can bring out the best in you.

## TEST 1 – Honey bees in trouble

Complete each sentence with the correct ending A-F.

1. Headline of colony collapse disorder states that	A native pollinators can survive when a specific plant is supplied.
2. Viewpoints of Freitas manifest that	B it would cause severe consequences both to commerce and agriculture.
3. Examples of blue orchard bees have shown that	C honey bees cannot be bred.
4. <i>Centris tarsata</i> is mentioned to exemplify that	D some agricultural landscapes are favorable in supporting wild bees.
5. One finding of the research in Delaware Valley is that	E a large scale of honey bees are needed to pollinate. F an agricultural system is fragile when relying on a single pollinator

**A.** Recently, ominous headlines have described a mysterious ailment, colony collapse disorder (CCD) that is wiping out the honeybees that pollinate many crops. Without honeybees, the story goes, fields will be sterile, economies will collapse, and food will be scarce.

**B.** But what few accounts acknowledge is that what's at risk is not itself a natural state of affairs. For one thing, in the United States, where CCD was first reported and has had its greatest impacts, honeybees are not a native species. Pollination in modern agriculture isn't alchemy, it's industry. The total number of hives involved in the U.S. pollination industry has been somewhere between 2.5 million and 3 million in recent years. Meanwhile, American farmers began using large quantities of organophosphate insecticides, planted large-scale crop mono-cultures, and adopted "clean farming" practices that scrubbed native vegetation from field margins and roadsides. These practices killed many native bees outright—they're as vulnerable to insecticides as any agricultural pest—and made the agricultural landscape inhospitable to those that remained. Concern about these practices and their effects on pollinators isn't new—in her 1962 ecological alarm cry *Silent Spring*, Rachel Carson warned of a 'Fruitless Fall' that could result from the disappearance of insect pollinators.

**C.** If that 'Fruitless Fall' has not—yet—occurred, it may be largely thanks to the honeybee, which farmers turned to as the ability of wild pollinators to service crops declined. The honeybee has been semi-domesticated since the time of the ancient Egyptians, but it wasn't just familiarity that determined this choice: the bees' biology is in many ways suited to the kind of agricultural system that was emerging. For example, honeybee hives can be closed up and moved out of the way when pesticides are applied to a field. The bees are generalist pollinators, so they can be used to pollinate many different crops. And although they are not the most efficient pollinator of every crop, honeybees have strength in numbers, with 20,000 to 100,000 bees living in a single hive. "Without a doubt, if there was one bee you wanted for agriculture, it would be the honeybee," says Jim Cane, of the U.S. Department of Agriculture. The honeybee, in other words, has become a crucial cog in the modern system of industrial agriculture. That system delivers more food, and more kinds of it, to more places, more cheaply than ever before. But that system is also vulnerable, because making a farm field into the photosynthetic equivalent of a factory floor, and pollination into a series of continent-long assembly lines, also leaches out some of the resilience characteristic of natural ecosystems.

**D.** Breno Freitas, an agronomist, pointed out that in nature such a high degree of specialization usually is a very dangerous game: it works well while all the rest is in equilibrium, but runs quickly to extinction at the least disbalance. In effect, by developing an agricultural system that is heavily reliant on a single



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pollinator species, we humans have become riskily overspecialized. And when the human-honeybee relationship is disrupted, as it has been by colony collapse disorder, the vulnerability of that agricultural system begins to become clear.

**E.** In fact, a few wild bees are already being successfully managed for crop pollination. “The problem is trying to provide native bees in adequate numbers on a reliable basis in a fairly short number of years in order to service the crop” Jim Cane says. “You’re talking millions of flowers per acre in a two-to three-week time frame, or less, for a lot of crops.” On the other hand, native bees can be much more efficient pollinators of certain crops than honeybees, so you don’t need as many to do the job. For example, about 750 blue orchard bees (*Osmia lignaria*) can pollinate a hectare of apples or almonds, a task that would require roughly 50,000 to 150,000 honeybees. There are bee tinkers engaged in similar work in many corners of the world. In Brazil, Breno Freitas has found that *Centris tarsata*, the native pollinator of wild cashew, can survive in commercial cashew orchards if growers provide a source of floral oils, such as by interplanting their cashew trees with Caribbean cherry.

**F.** In certain places, native bees may already be doing more than they’re getting credit for. Ecologist Rachael Winfree recently led a team that looked at pollination of four summer crops (tomato, watermelon, peppers, and muskmelon) at 29 farms in the region of New Jersey and Pennsylvania. Winfree’s team identified 54 species of wild bees that visited these crops, and found that wild bees were the most important pollinators in the system: even though managed honeybees were present on many of the farms, wild bees were responsible for 62 percent of flower visits in the study. In another study focusing specifically on watermelon, Winfree and her colleagues calculated that native bees alone could provide sufficient pollination at 90 percent of the 23 farms studied. By contrast, honeybees alone could provide sufficient pollination at only 78 percent of farms.

**G.** “The region I work in is not typical of the way most food is produced” Winfree admits. In the Delaware Valley, most farms and farm fields are relatively small, each farmer typically grows a variety of crops, and farms are interspersed with suburbs and other types of land use which means there are opportunities for homeowners to get involved in bee conservation, too. The landscape is a bee-friendly patchwork that provides a variety of nesting habitat and floral resources distributed among different kinds of crops, weedy field margins, fallow fields, suburban neighborhoods, and semi natural habitat like old woodlots, all at a relatively small scale. In other words, ‘pollinator-friendly’ farming practices would not only aid pollination of agricultural crops, but also serve as a key element in the overall conservation strategy for wild pollinators, and often aid other wild species as well.

**H.** Of course, not all farmers will be able to implement all of these practices. And researchers are suggesting a shift to a kind of polyglot agricultural system. For some small-scale farms, native bees may indeed be all that’s needed. For larger operations, a suite of managed bees—with honeybees filling the generalist role and other, native bees pollinating specific crops could be augmented by free pollination services from resurgent wild pollinators. In other words, they’re saying, we still have an opportunity to replace a risky monoculture with something diverse, resilient, and robust.

## TEST 2 – Internal Market: Selling the inside

Complete each sentence with the correct ending A-E.

**NB** You can use any letter **more than once**.

<ol style="list-style-type: none"><li>1. A health company</li><li>2. A financial institution</li><li>3. A computer company</li><li>4. An airline</li><li>5. A sport shoe company</li><li>6. A railway company</li></ol>	<p><b>A</b> alienated its employees by its apologetic branding campaign.</p> <p><b>B</b> attracted negative publicity through its advertising campaign.</p> <p><b>C</b> produced conflicting image between its employees and the general public.</p> <p><b>D</b> successfully used an advertising campaign to inspire employees</p> <p><b>E</b> draws on the legends of the company spirit.</p>
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When you think of marketing, you more than likely think of marketing to your customers: How can you persuade more people to buy what you sell? But another "market" is just as important: your employees, the very people who can make the brand come alive for your customers. Yet in our work helping executives develop and carry out branding campaigns, my colleagues and I have found that companies very often ignore this critical constituency.

Why is internal marketing so important? First, because it's the best way to help employees make a powerful emotional connection to the products and services you sell. Without that connection, employees are likely to undermine the expectations set by your advertising. In some cases, this is because they simply don't understand what you have promised the public, so they end up working at cross-purposes. In other cases, it may be they don't actually believe in the brand and feel disengaged or, worse, hostile toward the company.

We've found that when people care about and believe in the brand, they're motivated to work harder and their loyalty to the company increases. Employees are united and inspired by a common sense of purpose and identity.

Unfortunately, in most companies, internal marketing is done poorly, if at all. While executives recognise the need to keep people informed about the company's strategy and direction, few understand the need to convince employees of the brand's power—they take it as a given.

Employees need to hear the same messages that you send out to the marketplace. At most companies, however, internal and external communications are often mismatched. This can be very confusing, and it threatens employees' perceptions of the company's integrity: They are told one thing by management but observe that a different message is being sent to the public. One health insurance company, for instance, advertised that the welfare of patients was the company's number one priority, while employees were told that their main goal was to increase the value of their stock options through cost reductions. And one major financial services institution told customers that it was making a major shift in focus from being a financial retailer to a financial adviser, but, a year later, research showed that the customer experience with the company had not changed. It turned out that company leaders had not made an effort to sell the change internally, so employees were still churning out transactions and hadn't changed their behavior to match their new adviser role.

Enabling employees to deliver on customer expectations is important, of course, but it's not the only reason a company needs to match internal and external messages. Another reason is to help push the company to achieve goals that might otherwise be out of reach. In 1997, when IBM launched its ebusiness campaign (which is widely credited for turning around the company's image), it chose to ignore research that suggested consumers were unprepared to embrace IBM as a leader in e-business. Although to the outside world this looked like an external marketing effort, IBM was also using the campaign to align employees

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around the idea of the Internet as the future of technology. The internal campaign changed the way employees thought about everything they did, from how they named products to how they organised staff to how they approached selling. The campaign was successful largely because it gave employees a sense of direction and purpose, which in turn restored their confidence in IBM's ability to predict the future and lead the technology industry. Today, research shows that people are four times more likely to associate the term "e-business" with IBM than with its nearest competitor.

Perhaps even more important, by taking employees into account, a company can avoid creating a message that doesn't resonate with staff or, worse, one that builds resentment. In 1996, United Airlines shelved its "Come Fly the Friendly Skies" slogan when presented with a survey that revealed the depth of customer resentment toward the airline industry. In an effort to own up to the industry's shortcomings, United launched a new campaign, "Rising," in which it sought to differentiate itself by acknowledging poor service and promising incremental improvements such as better meals. While this was a logical premise for the campaign given the tenor of the times, a campaign focusing on customers' distaste for flying was deeply discouraging to the staff. Employee resentment, ultimately made it impossible for United to deliver the improvements it was promising, which in turn undermined the "Rising" pledge.

Three years later, United decided employee opposition was undermining its success and pulled the campaign. It has since moved to a more inclusive brand message with the line "United," which both audiences can embrace. Here, a fundamental principle of advertising—find and address a customer concern failed United because it did not consider the internal market.

When it comes to execution, the most common and effective way to link internal and external marketing campaigns is to create external advertising that targets both audiences. IBM used this tactic very effectively when it launched its e-business campaign. It took out an eight-page ad in the Wall Street Journal declaring its new vision, a message directed at both customers and internal stakeholders. This is an expensive way to capture attention, but if used sparingly, it is the most powerful form of communication; in fact, you need do it only once for everyone in the company to read it. There's a symbolic advantage as well. Such a tactic signals that the company is taking its pledge very seriously; it also signals transparency—the same message going out to both audiences.

Advertising isn't the only way to link internal and external marketing. At Nike, a number of senior executives now hold the additional title of "Corporate Storyteller." They deliberately avoid stories of financial successes and concentrate on parables of "just doing it," reflecting and reinforcing the company's ad campaigns. One tale, for example, recalls how legendary coach and Nike cofounder Bill Bowerman, in an effort to build a better shoe for his team, poured rubber into the family waffle iron, giving birth to the prototype of Nike's famous Waffle Sole. By talking about such inventive moves, the company hopes to keep the spirit of innovation that characterises its ad campaigns alive and well within the company. But while their messages must be aligned, companies must also keep external promises a little ahead of internal realities. Such promises provide incentives for employees and give them something to live up to. In the 1980s, Ford turned "Quality Is Job 1" from an internal rallying cry into a consumer slogan in response to the threat from cheaper, more reliable Japanese cars. It did so before the claim was fully justified, but by placing it in the public arena, it gave employees an incentive to match the Japanese. If the promise is pushed too far ahead, however, it loses credibility. When a beleaguered British Rail launched a campaign announcing service improvements under the banner "We're Getting There," it did so prematurely. By drawing attention to the gap between the promise and the reality, it prompted destructive press coverage. This, in turn, demoralised staff, who had been legitimately proud of the service advances they had made.

## TEST 3 – Musical Maladies

Complete each sentence with the correct ending A-F.

1. The dissociations between harmony and melody
2. The study of treating musical disorders
3. The EEG scans of Sacks's patients
4. Sacks believes testing based on new technologies

- A** show no music-brain disorders.  
**B** indicates that medication can have varied results.  
**C** is key for the neurological community to unravel the mysteries.  
**D** should not be used in isolation.  
**E** indicate that not everyone can receive good education.  
**F** show that music is not localised in the brain.

Music and the brain are both endlessly fascinating subjects, and as a neuroscientist specialising in auditory learning and memory, I find them especially intriguing. So I had high expectations of Musicophilia, the latest offering from neurologist and prolific author Oliver Sacks. And I confess to feeling a little guilty reporting that my reactions to the book are mixed.

Sacks himself is the best part of Musicophilia. He richly documents his own life in the book and reveals highly personal experiences. The photograph of him on the cover of the book—which shows him wearing headphones, eyes closed, clearly enchanted as he listens to Alfred Brendel perform Beethoven's Pathétique Sonata—makes a positive impression that is borne out by the contents of the book. Sacks's voice throughout is steady and erudite but never pontifical. He is neither self-conscious nor self-promoting. The preface gives a good idea of what the book will deliver. In it Sacks explains that he wants to convey the insights gleaned from the “enormous and rapidly growing body of work on the neural underpinnings of musical perception and imagery, and the complex and often bizarre disorders to which these are prone” He also stresses the importance of “the simple art of observation” and “the richness of the human context.” He wants to combine “observation and description with the latest in technology,” he says, and to imaginatively enter into the experience of his patients and subjects. The reader can see that Sacks, who has been practicing neurology for 40 years, is torn between the “old-fashioned” path of observation and the new-fangled, high-tech approach:

He knows that he needs to take heed of the latter, but his heart lies with the former. The book consists mainly of detailed descriptions of cases, most of them involving patients whom Sacks has seen in his practice. Brief discussions of contemporary neuroscientific reports are sprinkled liberally throughout the text. Part I, “Haunted by Music,” begins with the strange case of Tony Cicoria, a nonmusical, middle-aged surgeon who was consumed by a love of music after being hit by lightning. He suddenly began to crave listening to piano music, which he had never cared for in the past. He started to play the piano and then to compose music, which arose spontaneously in his mind in a “torrent” of notes. How could this happen? Was the cause psychological? (He had had a near-death experience when the lightning struck him.) Or was it the direct result of a change in the auditory regions of his cerebral cortex? Electroencephalography (EEG) showed his brain waves to be normal in the mid-1990s, just after his trauma and subsequent “conversion” to music. There are now more sensitive tests, but Cicoria has declined to undergo them; he does not want to delve into the causes of his musicality. What a shame! Part II, “A Range of Musicality,” covers a wider variety of topics, but unfortunately, some of the chapters offer little or nothing that is new. For example, chapter 13, which is five pages long, merely notes that the blind often have better hearing than the sighted. The most interesting chapters are those that present the strangest cases. Chapter 8 is about “amusia,” an inability to hear sounds as music, and “dysharmonia,” a highly specific impairment of the ability to hear harmony, with the ability to understand melody left intact. Such specific “dissociations” are found throughout the cases Sacks recounts. To Sacks's credit, part III, “Memory, Movement and Music,” brings us into the underappreciated realm of music therapy. Chapter 16 explains how “melodic intonation therapy” is being used to help expressive aphasia patients (those unable to express their thoughts verbally following a stroke or other cerebral incident) once again become capable of fluent speech. In chapter 20, Sacks



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demonstrates the near-miraculous power of music to animate Parkinson's patients and other people with severe movement disorders, even those who are frozen into odd postures. Scientists cannot yet explain how music achieves this effect.

To readers who are unfamiliar with neuroscience and music behavior, Musicophilia may be something of a revelation. But the book will not satisfy those seeking the causes and implications of the phenomena Sacks describes. For one thing, Sacks appears to be more at ease discussing patients than discussing experiments. And he tends to be rather uncritical in accepting scientific findings and theories. It's true that the causes of music-brain oddities remain poorly understood.

However, Sacks could have done more to draw out some of the implications of the careful observations that he and other neurologists have made and of the treatments that have been successful. For example, he might have noted that the many specific dissociations among components of music comprehension, such as loss of the ability to perceive harmony but not melody, indicate that there is no music center in the brain. Because many people who read the book are likely to believe in the brain localisation of all mental functions, this was a missed educational opportunity.

Another conclusion one could draw is that there seem to be no "cures" for neurological problems involving music. A drug can alleviate a symptom in one patient and aggravate it in another, or can have both positive and negative effects in the same patient. Treatments mentioned seem to be almost exclusively antiepileptic medications, which "damp down" the excitability of the brain in general; their effectiveness varies widely.

Finally, in many of the cases described here the patient with music brain symptoms is reported to have "normal" EEG results. Although Sacks recognizes the existence of new technologies, among them far more sensitive ways to analyze brain waves than the standard neurological EEG test, he does not call for their use. In fact, although he exhibits the greatest compassion for patients, he conveys no sense of urgency about the pursuit of new avenues in the diagnosis and treatment of music-brain disorders. This absence echoes the book's preface, in which Sacks expresses fear that "the simple art of observation may be lost" if we rely too much on new technologies. He does call for both approaches, though, and we can only hope that the neurological community will respond.



## TEST 4 – Theory or Practice? – What is the point of research carried out by biz schools?

Complete each sentence with the correct ending A-E.

1. Most professors support academic research because	A it progresses as we learn innovative ways of doing things.
2. Schools support academic research because	B the trends and standards are changing.
3. Our society needs academic research because	C their jobs depend on it.
4. Universities resisting the AACSB should change because	D they care about their school rankings and government funds.
	E it helps students to go into top business firms.

Students go to universities and other academic institutions to prepare for their future. We pay tuition and struggle through classes in the hopes that we can find a fulfilling and exciting career. But the choice of your university has a large influence on your future. How can you know which university will prepare you the best for your future? Like other academic institutions, business schools are judged by the quality of the research carried out by their faculties. Professors must both teach students and also produce original research in their own field.

The quality of this research is assessed by academic publications. At the same time, universities have another responsibility to equip their students for the real world, however that is defined. Most students learning from professors will not go into academics themselves—so how do academics best prepare them for their future careers, whatever that may be? Whether academic research actually produces anything that is useful to the practice of business, or even whether it is its job to do so, are questions that can provoke vigorous arguments on campus.

The debate, which first flared during the 1950s, was reignited in August, when AACSB International, the most widely recognised global accrediting agency for business schools, announced it would consider changing the way it evaluates research. The news followed rather damning criticism in 2002 from Jeffrey Pfeffer, a Stanford professor, and Christina Fong of Washington University, which questioned whether business education in its current guise was sustainable. The study found that traditional modes of academia were not adequately preparing students for the kind of careers they faced in current times. The most controversial recommendation in AACSB's draft report (which was sent round to administrators for their comment) is that the schools should be required to demonstrate the value of their faculties' research not simply by listing its citations in journals, but by demonstrating the impact it has in the professional world. New qualifiers, such as average incomes, student placement in top firms and business collaborations would now be considered just as important as academic publications.

AACSB justifies its stance by saying that it wants schools and faculty to play to their strengths, whether they be in pedagogy, in the research of practical applications, or in scholarly endeavor. Traditionally, universities operate in a pyramid structure. Everyone enters and stays in an attempt to be successful in their academic field. A psychology professor must publish competitive research in the top neuroscience journals. A Cultural Studies professor must send graduate students on new field research expeditions to be taken seriously. This research is the core of a university's output. And research of any kind is expensive—AACSB points out that business schools in America alone spend more than \$320m a year on it. So it seems legitimate to ask for, 'what purpose it is undertaken?

If a school chose to specialise in professional outputs rather than academic outputs, it could use such a large sum of money and redirect it into more fruitful programs. For example, if a business school wanted a larger presence of employees at top financial firms, this money may be better spent on a career center which focuses on building the skills of students, rather than paying for more high-level research to be done through the effort of faculty. A change in evaluation could also open the door to inviting more professionals from

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different fields to teach as adjuncts. Students could take accredited courses from people who are currently working in their dream field. The AACSB insists that universities answer the question as to why research is the most critical component of traditional education.

On one level, the question is simple to answer. Research in business schools, as anywhere else, is about expanding the boundaries of knowledge; it thrives on answering unasked questions. Surely this pursuit of knowledge is still important to the university system. Our society progresses because we learn how to do things in new ways, a process which depends heavily on research and academics. But one cannot ignore the other obvious practical uses of research publications. Research is also about cementing schools' and professors' reputations. Schools gain kudos from their faculties' record of publication: which journals publish them, and how often. In some cases, such as with government-funded schools in Britain, it can affect how much money they receive. For professors, the mantra is often "publish or perish". Their careers depend on being seen in the right journals.

But at a certain point, one has to wonder whether this research is being done for the benefit of the university or for the students the university aims to teach. Greater publications will attract greater funding, which will in turn be spent on better publications. Students seeking to enter professions out of academia find this cycle frustrating, and often see their professors as being part of the "Ivory Tower" of academia, operating in a self-contained community that has little influence on the outside world.

The research is almost universally unread by real-world managers. Part of the trouble is that the journals labour under a similar ethos. They publish more than 20,000 articles each year. Most of the research is highly quantitative, hypothesis-driven and esoteric. As a result, it is almost universally unread by real-world managers. Much of the research criticises other published research.

A paper in a 2006 issue of *Strategy & Leadership* commented that "research is not designed with managers' needs in mind, nor is it communicated in the journals they read. For the most part, it has become a self-referential closed system irrelevant to corporate performance." The AACSB demands that this segregation must change for the future of higher education. If students must invest thousands of dollars for an education as part of their career path, the academics which serve the students should be more fully incorporated into the professional world. This means that universities must focus on other strengths outside of research, such as professional networks, technology skills, and connections with top business firms around the world. Though many universities resisted the report, today's world continues to change. The universities which prepare students for our changing future have little choice but to change with new trends and new standards.

## TEST 5 – What Do Babies Know?

Complete each sentence with the correct ending A-E.

<ol style="list-style-type: none"><li>1. Jean Piaget thinks infants younger than 9 months won't know something existing</li><li>2. Jean Piaget thinks babies only get the knowledge</li><li>3. Some cognitive scientists think babies have the mechanism to learn a language</li><li>4. Sylvain Sirois thinks that babies can reflect a response to stimuli that are novel</li><li>5. Sylvain Sirois thinks babies' attention level will drop</li></ol>	<p>A before they are born. B before they learn from experience. C when they had seen the same thing for a while. D when facing the possible and impossible events. E when the previous things appear again in the lives.</p>
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As Daniel Haworth is settled into a high chair and wheeled behind a black screen, a sudden look of worry furrows his 9-month-old brow. His dark blue eyes dart left and right in search of the familiar reassurance of his mother's face. She calls his name and makes soothing noises, but Daniel senses something unusual is happening. He sucks his fingers for comfort, but, finding no solace, his mouth crumples, his body stiffens, and he lets rip an almighty shriek of distress. This is the usual expression when babies are left alone or abandoned. Mom picks him up, reassures him, and two minutes later, a chortling and alert Daniel returns to the darkened booth behind the screen and submits himself to baby lab, a unit set up in 2005 at the University of Manchester in northwest England to investigate how babies think. Watching infants piece life together, seeing their senses, emotions and motor skills take shape, is a source of mystery and endless fascination—at least to parents and developmental psychologists. We can decode their signals of distress or read a million messages into their first smile. But how much do we really know about what's going on behind those wide, innocent eyes? How much of their understanding of and response to the world comes preloaded at birth? How much is built from scratch by experience? Such are the questions being explored at baby lab. Though the facility is just 18 months old and has tested only 100 infants, it's already challenging current thinking on what babies know and how they come to know it.

Daniel is now engrossed in watching video clips of a red toy train on a circular track. The train disappears into a tunnel and emerges on the other side. A hidden device above the screen is tracking Daniel's eyes as they follow the train and measuring the diameter of his pupils 50 times a second. As the child gets bored—or “habituated”, as psychologists call the process his attention level steadily drops. But it picks up a little whenever some novelty is introduced. The train might be green, or it might be blue. And sometimes an impossible thing happens—the train goes into the tunnel one color and comes out another. Variations of experiments like this one, examining infant attention, have been a standard tool of developmental psychology ever since the Swiss pioneer of the field, Jean Piaget, started experimenting on his children in the 1920s. Piaget's work led him to conclude that infants younger than 9 months have no innate knowledge of how the world works or any sense of “object permanence” (that people and things still exist even when they're not seen). Instead, babies must gradually construct this knowledge from experience. Piaget's “constructivist” theories were massively influential on postwar educators and psychologist, but over the past 20 years or so they have been largely set aside by a new generation of “nativist” psychologists and cognitive scientists whose more sophisticated experiments led them to theorise that infants arrive already equipped with some knowledge of the physical world and even rudimentary programming for math and language. Baby lab director Sylvain Sirois has been putting these smart-baby theories through a rigorous set of tests. His conclusions so far tend to be more Piagetian: “Babies,” he says, “know nothing.” What Sirois and his postgraduate assistant Lain Jackson are challenging is the interpretation of a variety of classic experiments begun in the mid-1980s in which babies were shown physical events that appeared to violate

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such basic concepts as gravity, solidity and contiguity. In one such experiment, by University of Illinois psychologist Renee Baillargeon, a hinged wooden panel appeared to pass right through a box. Baillargeon and M.I.T's Elizabeth Spelke found that babies as young as 3 1/2 months would reliably look longer at the impossible event than at the normal one. Their conclusion: babies have enough built-in knowledge to recognise that something is wrong.

Sirois does not take issue with the way these experiments were conducted. "The methods are correct and replicable," he says, "it's the interpretation that's the problem." In a critical review to be published in the forthcoming issue of the European Journal of Developmental Psychology, he and Jackson pour cold water over recent experiments that claim to have observed innate or precocious social cognition skills in infants. His own experiments indicate that a baby's fascination with physically impossible events merely reflects a response to stimuli that are novel. Data from the eye tracker and the measurement of the pupils (which widen in response to arousal or interest) show that impossible events involving familiar objects are no more interesting than possible events involving novel objects. In other words, when Daniel had seen the red train come out of the tunnel green a few times, he gets as bored as when it stays the same color. The mistake of previous research, says Sirois, has been to leap to the conclusion that infants can understand the concept of impossibility from the mere fact that they are able to perceive some novelty in it. "The real explanation is boring," he says.

So how do babies bridge the gap between knowing squat and drawing triangles a task Daniel's sister Lois, 2 1/2, is happily tackling as she waits for her brother? "Babies have to learn everything, but as Piaget was saying, they start with a few primitive reflexes that get things going," said Sirois. For example, hardwired in the brain is an instinct that draws a baby's eyes to a human face. From brain imaging studies we also know that the brain has some sort of visual buffer that continues to represent objects after they have been removed a lingering perception rather than conceptual understanding. So when babies encounter novel or unexpected events, Sirois explains, "there's a mismatch between the buffer and the information they're getting at that moment. And what you do when you've got a mismatch is you try to clear the buffer. And that takes attention." So learning, says Sirois, is essentially the laborious business of resolving mismatches. "The thing is, you can do a lot of it with this wet sticky thing called a brain. It's a fantastic, statistical-learning machine". Daniel, exams ended, picks up a plastic tiger and, chewing thoughtfully upon its heat, smiles as if to agree.



## TEST 6 – What is Meaning?

Complete each sentence with the correct ending A-H.

<ol style="list-style-type: none"><li>1. A comic strip</li><li>2. A dictionary</li><li>3. Bridgman</li><li>4. A story in a language the audience cannot understand</li><li>5. A dollar bill</li></ol>	<p><b>A</b> is meaningless.</p> <p><b>B</b> has lasting effects on human behaviors.</p> <p><b>C</b> is a symbol that has lost its meaning.</p> <p><b>D</b> can be understood only in its social context.</p> <p><b>E</b> can provide inadequate explanation of meaning.</p> <p><b>F</b> reflects the variability of human behaviors.</p> <p><b>G</b> emphasizes the importance of analyzing how words were used.</p> <p><b>H</b> suggests that certain types of behaviors carry more meanings than others.</p>
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The end, product of education, yours and mine and everybody's, is the total pattern of reactions and possible reactions we have inside ourselves. If you did not have within you at this moment the pattern of reactions that we call "the ability to read." you would see here only meaningless black marks on paper. Because of the trained patterns of response, you are (or are not) stirred to patriotism by martial music, your feelings of reverence are aroused by symbols of your religion, you listen more respectfully to the health advice of someone who has "MD" after his name than to that of someone who hasn't. What I call here a "pattern of reactions", then, is the sum total of the ways we act in response to events, to words, and to symbols.

Our reaction patterns or our semantic habits, are the internal and most important residue of whatever years of education or miseducation we may have received from our parents' conduct toward us in childhood as well as their teachings, from the formal education we may have had, from all the lectures we have listened to, from the radio programs and the movies and television shows we have experienced, from all the books and newspapers and comic strips we have read, from the conversations we have had with friends and associates, and from all our experiences. If, as the result of all these influences that make us what we are, our semantic habits are reasonably similar to those of most people around us, we are regarded as "normal," or perhaps "dull." If our semantic habits are noticeably different from those of others, we are regarded as "individualistic" or "original." or, if the differences are disapproved of or viewed with alarm, as "crazy."

Semantics is sometimes defined in dictionaries as "the science of the meaning of words"— which would not be a bad definition if people didn't assume that the search for the meanings of words begins and ends with looking them up in a dictionary. If one stops to think for a moment, it is clear that to define a word, as a dictionary does, is simply to explain the word with more words. To be thorough about defining, we should next have to define the words used in the definition, then define the words used in defining the words used in the definition and so on. Defining words with more words, in short, gets us at once into what mathematicians call an "infinite regress". Alternatively, it can get us into the kind of run-around we sometimes encounter when we look up "impertinence" and find it defined as "impudence," so we look up "impudence" and find it defined as "impertinence." Yet—and here we come to another common reaction pattern—people often act as if words can be explained fully with more words. To a person who asked for a definition of jazz, Louis Armstrong is said to have replied, "Man. when you got to ask what it is, you'll never get to know," proving himself to be an intuitive semanticist as well as a great trumpet player.

Semantics, then, does not deal with the "meaning of words" as that expression is commonly understood. P. W. Bridgman, the Nobel Prize winner and physicist, once wrote, "The true meaning of a term is to be found by observing what a man does with it, not by what he says about it." He made an enormous contribution to science by showing that the meaning of a scientific term lies in the operations, the things done, that establish its validity, rather than in verbal definitions. Here is a simple, everyday kind of example



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of “operational” definition. If you say, “This table measures six feet in length,” you could prove it by taking a foot rule, performing the operation of laying it end to end while counting, “One...two...three...four...” But if you say—and revolutionists have started uprisings with just this statement “Man is born free, but everywhere he is in chains!”—what operations could you perform to demonstrate its accuracy or inaccuracy?

But let us carry this suggestion of “operationalism” outside the physical sciences where Bridgman applied it, and observe what “operations” people perform as the result of both the language they use and the language other people use in communicating to them. Here is a personnel manager studying an application blank. He comes to the words “Education: Harvard University,” and drops the application blank in the wastebasket (that’s the “operation”) because, as he would say if you asked him, “I don’t like Harvard men.” This is an instance of “meaning” at work—but it is not a meaning that can be found in dictionaries.

If I seem to be taking a long time to explain what semantics is about, it is because I am trying, in the course of explanation, to introduce the reader to a certain way of looking at human behavior. I say human responses because, so far as we know, human beings are the only creatures that have, over and above that biological equipment which we have in common with other creatures, the additional capacity for manufacturing symbols and systems of symbols. When we react to a flag, we are not reacting simply to a piece of cloth, but to the meaning with which it has been symbolically endowed. When we react to a word, we are not reacting to a set of sounds, but to the meaning with which that set of sounds has been symbolically endowed.

A basic idea in general semantics, therefore, is that the meaning of words (or other symbols) is not in the words, but in our own semantic reactions. If I were to tell a shockingly obscene story in Arabic or Hindustani or Swahili before an audience that understood only English, no one would blush or be angry; the story would be neither shocking nor obscene-induced, it would not even be a story. Likewise, the value of a dollar bill is not in the bill, but in our social agreement to accept it as a symbol of value. If that agreement were to break down through the collapse of our government, the dollar bill would become only a scrap of paper. We do not understand a dollar bill by staring at it long and hard. We understand it by observing how people act with respect to it. We understand it by understanding the social mechanisms and the loyalties that keep it meaningful. Semantics is therefore a social study, basic to all other social studies.

## TEST 7 – Grimm's Fairy Tales

Complete each sentence with the correct ending A-H.

<ol style="list-style-type: none"><li>1. Heinz Rolleke said the Grimm's tales are "German" because the tales</li><li>2. Heinz Rolleke said the abandoned children in tales</li><li>3. Bernhard Lauer said the writing style of the Grimm brothers is universal because they</li><li>4. Jack Zipes said the pursuit of happiness in the tales means they</li><li>5. Bruno Bettelheim said the therapeutic value of the tales means that the fairytales</li></ol>	<ol style="list-style-type: none"><li>A reflect what life was like at that time.</li><li>B help children deal with their problems.</li><li>C demonstrate the outdated system.</li><li>D tell of the simplicity of life in the German countryside.</li><li>E encourage people to believe that they can do anything.</li><li>F recognize the heroes in the real life.</li><li>G contribute to the belief in nature power.</li><li>H avoid details about characters' social settings.</li></ol>
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The Brothers Grimm, Jacob and Wilhelm, named their story collection Children's and Household Tales and published the first of its seven editions in Germany in 1812. The table of contents reads like an A-list of fairy-tale celebrities: Cinderella, Sleeping Beauty, Snow White, Little Red Riding Hood, Rapunzel, Rumpelstiltskin, Hansel and Gretel, the Frog King. Drawn mostly from oral narratives, the 210 stories in the Grimms' collection represent an anthology of fairy tales, animal fables, rustic farces, and religious allegories that remain unrivalled to this day.

Such lasting fame would have shocked the humble Grimms. During their lifetimes the collection sold modestly in Germany, at first only a few hundred copies a year. The early editions were not even aimed at children. The brothers initially refused to consider illustrations, and scholarly footnotes took up almost as much space as the tales themselves. Jacob and Wilhelm viewed themselves as patriotic folklorists, not as entertainers of children. They began their work at a time when Germany had been overrun by the French under Napoleon, who were intent on suppressing local culture.

As young, workaholic scholars, single and sharing a cramped flat, the Brothers Grimm undertook the fairy-tale collection with the goal of saving the endangered oral tradition of Germany. For much of the 19th century teachers, parents, and religious figures, particularly in the United States, deplored the Grimms' collection for its raw, uncivilized content. Offended adults objected to the gruesome punishments inflicted on the stories' villains. In the original "Snow White" the evil stepmother is forced to dance in red-hot iron shoes until she falls down dead. Even today some protective parents shy from the Grimms' tales because of their reputation for violence.

Despite its sometimes rocky reception, Children's and Household Tales gradually took root with the public. The brothers had not foreseen that the appearance of their work would coincide with a great flowering of children's literature in Europe. English publishers led the way, issuing high-quality picture books such as Jack and the Beanstalk and handsome folktale collections, all to satisfy a newly literate audience seeking virtuous material for the nursery. Once the Brothers Grimm sighted this new public, they set about refining and softening their tales, which had originated centuries earlier as earthy peasant fare. In the Grimms' hands, cruel mothers became nasty stepmothers, unmarried lovers were made chaste, and the incestuous father was recast as the devil.

In the 20th century the Grimms' fairy tales have come to rule the bookshelves of children's bedrooms. The stories read like dreams come true: handsome lads and beautiful damsels, armed with magic, triumph over giants and witches and wild beasts. They outwit mean, selfish adults. Inevitably the boy and girl fall in love and live happily ever after. And parents keep reading because they approve of the finger-wagging lessons inserted into the stories: keep your promises, don't talk to strangers, work hard, obey your parents. According to the Grimms, the collection served as "a manual of manners". Altogether some 40 persons

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delivered tales to the Grimms. Many of the storytellers came to the Grimms' house in Kassel. The brothers particularly welcomed the visits of Dorothea Viehmann, a widow who walked to town to sell produce from her garden.

An innkeeper's daughter, Viehmann had grown up listening to stories from travelers on the road to Frankfurt. Among her treasures was "Aschenputtel"—Cinderella. Marie Hassenpflug was a 20-year-old friend of their sister, Charlotte, from a well-bred, French-speaking family. Marie's wonderful stories blended motifs from the oral tradition and from Perrault's influential 1697 book, *Tales of My Mother Goose*, which contained elaborate versions of "Little Red Riding Hood", "Snow White", and "Sleeping Beauty", among others. Many of these had been adapted from earlier Italian fairy tales.

Given that the origins of many of the Grimm fairy tales reach throughout Europe and into the Middle East and Orient, the question must be asked: How German are the Grimm tales? Very, says scholar Heinz Rolleke. Love of the underdog, rustic simplicity, creative energy—these are Teutonic traits. The coarse texture of life during medieval times in Germany, when many of the tales entered the oral tradition, also coloured the narratives. Throughout Europe children were often neglected and abandoned, like Hansel and Gretel. Accused witches were burned at the stake, like the evil mother-in-law in "The Six Swans". "The cruelty in the stories was not the Grimms' fantasy", Rolleke points out. "It reflected the law-and-order system of the old times". The editorial fingerprints left by the Grimms betray the specific values of 19th-century Christian, bourgeois German society. But that has not stopped the tales from being embraced by almost every culture and nationality in the world. What accounts for this widespread, enduring popularity? Bernhard Lauer points to the "universal style" of the writing. "You have no concrete descriptions of the land, or the clothes, or the forest, or the castles. It makes the stories timeless and placeless." "The tales allow us to express 'our utopian longings'," says lack Zipes of the University of Minnesota, whose 1987 translation of the complete fairy tales captures the rustic vigour of the original text. "They show a striving for happiness that none of us knows but that we sense is possible. We can identify with the heroes of the tales and become in our mind the masters and mistresses of our own destinies. "

Fairy tales provide a workout for the unconscious, psychoanalysts maintain. Bruno Bettelheim famously promoted the therapeutic value of the Grimms' stories, calling fairy tales the "great comforters". By confronting fears and phobias, symbolized by witches, heartless stepmothers, and hungry wolves, children find they can master their anxieties. Bettelheim's theory continues to be hotly debated. But most young readers aren't interested in exercising their unconsciousness. The Grimm tales in fact please in an infinite number of ways. Something about them seems to mirror whatever moods or interests we bring to our reading of them. This flexibility of interpretation suits them for almost any time and any culture.

## TEST 8 – Personality and appearance

Complete each sentence with the correct ending A-F.

1. Perret believed people behaving dishonestly	A. judge other people by overgeneralization,
2. The writer supports the view that people with babyish features	B. may influence the behaviour of other people,
3. According to Zebrowitz, baby-faced people who behave dominantly	C. tend to commit criminal acts.
4. The writer believes facial features	D. may be influenced by the low expectations of other people.
	E. may show the effect of long-term behaviours.
	F. may be trying to repel the expectations of other people.

When Charles Darwin applied to be the “energetic young man” that Robert Fitzroy, the Beagle’s captain, sought as his gentleman companion, he was almost let down by a woeful shortcoming that was as plain as the nose on his face. Fitzroy believed in physiognomy—the idea that you can tell a person’s character from their appearance. As Darwin’s daughter Henrietta later recalled, Fitzroy had “made up his mind that no man with such a nose could have energy”. This was hardly the case. Fortunately, the rest of Darwin’s visage compensated for his sluggardly proboscis: “His brow saved him.” The idea that a person’s character can be glimpsed in their face dates back to the ancient Greeks. It was most famously popularised in the late 18th century by the Swiss poet Johann Lavater, whose ideas became a talking point in intellectual circles. In Darwin’s day, they were more or less taken as given. It was only after the subject became associated with phrenology, which fell into disrepute in the late 19th century, that physiognomy was written off as pseudoscience.

First impressions are highly influential, despite the well-worn admonition not to judge a book by its cover. Within a tenth of a second of seeing an unfamiliar face we have already made a judgement about its owner’s character—caring, trustworthy, aggressive, extrovert, competent and so on. Once that snap judgement has formed, it is surprisingly hard to budge. People also act on these snap judgements. Politicians with competent-looking faces have a greater chance of being elected, and CEOs who look dominant are more likely to run a profitable company. There is also a well-established “attractiveness halo”. People seen as good-looking not only get the most valentines but are also judged to be more outgoing, socially competent, powerful, intelligent and healthy.

In 1966, psychologists at the University of Michigan asked 84 undergraduates who had never met before to rate each other on five personality traits, based entirely on appearance, as they sat for 15 minutes in silence. For three traits—extroversion, conscientiousness and openness—the observers’ rapid judgements matched real personality scores significantly more often than chance. More recently, researchers have re-examined the link between appearance and personality, notably Anthony Little of the University of Stirling and David Perrett of the University of St Andrews, both in the UK. They pointed out that the Michigan studies were not tightly controlled for confounding factors. But when Little and Perrett re-ran the experiment using mugshots rather than live subjects, they also found a link between facial appearance and personality—though only for extroversion and conscientiousness. Little and Perrett claimed that they only found a correlation at the extremes of personality.

Justin Carre and Cheryl McCormick of Brock University in Ontario, Canada studied 90 ice-hockey players. They found that a wider face in which the cheekbone-to-cheekbone distance was unusually large relative to the distance between brow and upper lip was linked in a statistically significant way with the number of penalty minutes a player was given for violent acts including slashing, elbowing, checking from behind and fighting. The kernel of truth idea isn’t the only explanation on offer for our readiness to make facial judgements. Leslie Zebrowitz, a psychologist at Brandeis University in Waltham, Massachusetts, says that in many cases snap judgements are not accurate. The snap judgement, she says, is often an “overgeneralisation” of a more fundamental response. A classic example of overgeneralisation can be seen

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in predators' response to eye spots, the conspicuous circular markings seen on some moths, butterflies and fish. These act as a deterrent to predators because they mimic the eyes of other creatures that the potential predators might see as a threat. Another researcher who leans towards overgeneralisation is Alexander Todorov. With Princeton colleague Nikolaas Oosterhof, he recently put forward a theory which he says explains our snap judgements of faces in terms of how threatening they appear.

Todorov and Oosterhof asked people for their gut reactions to pictures of emotionally neutral faces, sifted through all the responses, and boiled them down to two underlying factors: how trustworthy the face looks, and how dominant. Todorov and Oosterhof conclude that personality judgements based on people's faces are an overgeneralisation of our evolved ability to infer emotions from facial expressions, and hence a person's intention to cause us harm and their ability to carry it out. Todorov, however, stresses that overgeneralisation does not rule out the idea that there is sometimes a kernel of truth in these assessments of personality.

So if there is a kernel of truth, where does it come from? Perrett has a hunch that the link arises when our prejudices about faces turn into self-fulfilling prophecies an idea that was investigated by other researchers back in 1977. Our expectations can lead us to influence people to behave in ways that confirm those expectations: consistently treat someone as untrustworthy and they end up behaving that way. This effect sometimes works the other way round, however, especially for those who look cute. The Nobel prize-winning ethologist Konrad Lorenz once suggested that baby-faced features evoke a nurturing response. Support for this has come from work by Zebrowitz, who has found that baby-faced boys and men stimulate an emotional centre of the brain, the amygdala, in a similar way. But there's a twist. Babyfaced men are, on average, better educated, more assertive and apt to win more military medals than their mature-looking counterparts. They are also more likely to be criminals; think Al Capone. Similarly, Zebrowitz found baby-faced boys to be quarrelsome and hostile, and more likely to be academic highfliers. She calls this the "self-defeating prophecy effect": a man with a baby face strives to confound expectations and ends up overcompensating.

There is another theory that recalls the old parental warning not to pull faces, because they might freeze that way. According to this theory, our personality moulds the way our faces look. It is supported by a study two decades ago which found that angry old people tend to look cross even when asked to strike a neutral expression. A lifetime of scowling, grumpiness and grimaces seemed to have left its mark.



## TEST 9 – Malaria

Complete each sentence with the correct ending A-H.

<ol style="list-style-type: none"><li>1. Anopheline mosquitoes</li><li>2. Parasites located in victims' livers</li><li>3. Unfinished courses of anti-malarial drugs</li><li>4. Control programs to protect people from malaria</li></ol>	<p><b>A</b> have finally been eradicated.</p> <p><b>B</b> are not always affected by insecticides.</p> <p><b>C</b> are the results of incompetent doctors.</p> <p><b>D</b> are always female.</p> <p><b>E</b> have been taken for hundreds of years.</p> <p><b>F</b> should be based on seven clear goals.</p> <p><b>G</b> have resulted in parasitic resistance to treatment.</p> <p><b>H</b> are later found again in the bloodstream.</p>
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**A.** Approximately 300 million people worldwide are affected by malaria and between 1 and 1.5 million people die from it every year. Previously extremely widespread, malaria is now mainly confined to Africa, Asia and Latin America. The problem of controlling malaria in these countries is aggravated by inadequate health structures and poor socio-economic conditions. The situation has become even more complex over the last few years with the increase in resistance to the drugs normally used to combat the parasite that causes the disease.

**B.** Malaria is caused by protozoan parasites of the genus Plasmodium. Four species of Plasmodium can produce the disease in its various forms: plasmodium falciparum, plasmodium vivax, plasmodium ovale and plasmodium malaria. Plasmodium falciparum is the most widespread and dangerous of the four: untreated it can lead to fatal cerebral malaria. Malaria parasites are transmitted from one person to another by the female anopheline mosquito. The males do not transmit the disease as they feed only on plant juices. There are about 380 species of anopheline mosquito, but only 60 or so are able to transmit the parasite. Their sensitivity to insecticides is also highly variable.

**C.** Plasmodium develops in the gut of the mosquito and is passed on in the saliva of an infected insect each time it takes a new blood meal. The parasites are then carried by the blood into the victim's liver where they invade the cells and multiply. After nine to sixteen days they return to the blood and penetrate the red cells where they multiply again, progressively breaking down the red cells. This induces bouts of fever and anaemia in the infected individual. In the case of cerebral malaria the infected red cells obstruct the blood vessels in the brain. Other vital organs can also be damaged often leading to the death of the patient.

**D.** Malaria is diagnosed by the clinical symptoms and microscopic examination of the blood. It can normally be cured by anti-malarial drugs. The symptoms - fever, shivering, pain in the joints and headache - quickly disappear once the parasite is killed. In certain regions, however, the parasites have developed resistance to certain anti-malarial drugs, particularly chloroquine. Patients in these areas require treatment with other more expensive drugs. In endemic regions where transmission rates are high, people are continually infected so that they gradually develop immunity to the disease. Until they have acquired such immunity, children remain highly vulnerable. Pregnant women are also highly susceptible since the natural defence mechanisms are reduced during pregnancy.

**E.** Malaria has been known since time immemorial but it was centuries before the true causes were understood. Surprisingly in view of this some ancient treatments were remarkably effective. An infusion of qinghao containing artemisinin has been used for at least the last 2000 years in China and the antifebrile properties of the bitter bark of Cinchona Ledgeriana were known in Peru before the 15th century. Quinine, the active ingredient of this potion, was first isolated in 1820 by the pharmacists. Although people were unaware of the origin of malaria and the mode of transmission, protective measures against the mosquito

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have been used for many hundreds of years. The inhabitants of swampy regions in Egypt were recorded as sleeping in tower-like structures out of the reach of mosquitoes, whereas others slept under nets as early as 450 B.C.

**F.** Malaria has social consequences and is a heavy burden on economic development. It is estimated that a single bout of malaria costs a sum equivalent to over 10 working days in Africa. The cost of treatment is between \$US0.08 and \$US5.30 according to the type of drugs prescribed as determined by local drug resistance. In 1987 the total cost of malaria - health care, treatment, lost production, etc. - was estimated to be \$US800 million for tropical Africa and this figure is currently estimated to be more than \$US1800 million.

**G.** The significance of malaria as a health problem is increasing in many parts of the world. Epidemics are even occurring around traditionally endemic zones in areas where transmission had been eliminated. These outbreaks are generally associated with deteriorating social and economic conditions and the main victims are underprivileged rural populations. Economic and political pressures compel entire populations to leave malaria free areas and move into endemic zones. People who are non-immune are at high risk of severe disease. Unfortunately, these population movements and the intensive urbanisation are not always accompanied by adequate development of sanitation and health care. In many areas conflict, economic crises and administrative disorganization can result in the disruption of health services. The absence of adequate health services frequently results in recourse to self-administration of drugs often with incomplete treatment. This is a major factor in the increase in resistance of the parasites to previously effective drugs.

**H.** The hope of global eradication of malaria was finally abandoned in 1969 when it was recognized that this was unlikely ever to be achieved. Ongoing control programs remain essential in endemic areas. In all situations control programs should be based on half a dozen objectives: provision of early diagnosis, prompt treatment to all people at risk, selective application of sustainable preventive measures, vector control adapted to the local situations, the development of reliable information on infection risk and assessment of living conditions of concerned populations. Malaria is a complex disease but it is a curable and preventable one.

## TEST 10 - Placebo effect - The Power of Nothing

Complete each sentence with the correct ending A-H.

<ol style="list-style-type: none"><li>1. Appointments with alternative practitioner</li><li>2. An alternative practitioner's description of treatment</li><li>3. An alternative practitioner who has faith in what he does</li><li>4. The illness of patients convinced of alternative practice</li><li>5. Improvements of patients receiving alternative practice</li><li>6. Conventional medical doctors</li></ol>	<p><b>A</b> should be easy to understand. <b>B</b> ought to improve by itself. <b>C</b> should not involve any mysticism. <b>D</b> ought to last a minimum length of time. <b>E</b> needs to be treated at the right time. <b>F</b> should give more recognition. <b>G</b> can earn high income. <b>H</b> do not rely on any specific treatment.</p>
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Want to devise a new form of alternative medicine? No problem. Here's the recipe. Be warm, sympathetic, reassuring and enthusiastic. Your treatment should involve physical contact, and each session with your patients should last at least half an hour. Encourage your patients to take an active part in their treatment and understand how their disorders relate to the rest of their lives. Tell them that their own bodies possess the true power to heal. Make them pay you out of their own pockets. Describe your treatment in familiar words, but embroidered with a hint of mysticism: energy fields, energy flows, energy blocks, meridians, forces, auras, rhythms and the like. Refer to the knowledge of an earlier age: wisdom carelessly swept aside by the rise and rise of blind, mechanistic science. Oh, come off it, you're saying. Something invented off the top of your head couldn't possibly work, could it?

Well yes, it could—and often well enough to earn you a living. A good living if you are sufficiently convincing or, better still, really believe in your therapy. Many illnesses get better on their own, so if you are lucky and administer your treatment at just the right time you'll get the credit. But that's only part of it. Some of the improvement really would be down to you. Not necessarily because you'd recommended ginseng rather than camomile tea or used this crystal as opposed to that pressure point. Nothing so specific. Your healing power would be the outcome of a paradoxical force that conventional medicine recognises but remains oddly ambivalent about: the placebo effect.

Placebos are treatments that have no direct effect on the body, yet still work because the patient has faith in their power to heal. Most often the term refers to a dummy pill, but it applies just as much to any device or procedure, from a sticking plaster to a crystal to an operation. The existence of the placebo effect implies that even quackery may confer real benefits, which is why any mention of placebo is a touchy subject for many practitioners of complementary and alternative medicine (CAM), who are likely to regard it as tantamount to a charge of charlatanism. In fact, the placebo effect is a powerful part of all medical care, orthodox or otherwise, though its role is often neglected and misunderstood.

One of the great strengths of CAM may be its practitioners' skill in deploying the placebo effect to accomplish real healing. "Complementary practitioners are miles better at producing non-specific effects and good therapeutic relationships," says Edzard Ernst, professor of CAM at Exeter University. The question is whether CAM could be integrated into conventional medicine, as some would like, without losing much of this power.

At one level, it should come as no surprise that our state of mind can influence our physiology: anger opens the superficial blood vessels of the face; sadness pumps the tear glands. But exactly how placebos work their medical magic is still largely unknown. Most of the scant research to date has focused on the control of pain, because it's one of the commonest complaints and lends itself to experimental study. Here, attention has turned to the endorphins, natural counterparts of morphine that are known to help control pain. "Any of the neurochemicals involved in transmitting pain impulses or modulating them might also be

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involved in generating the placebo response," says Don Price, an oral surgeon at the University of Florida who studies the placebo effect in dental pain.

"But endorphins are still out in front." That case has been strengthened by the recent work of Fabrizio Benedetti of the University of Turin, who showed that the placebo effect can be abolished by a drug, naloxone, which blocks the effects of endorphins. Benedetti induced pain in human volunteers by inflating a bloodpressure cuff on the forearm. He did this several times a day for several days, using morphine each time to control the pain. On the final day, without saying anything, he replaced the morphine with a saline solution. This still relieved the subjects' pain: a placebo effect. But when he added naloxone to the saline the pain relief disappeared. Here was direct proof that placebo analgesia is mediated, at least in part, by these natural opiates.

Still, no one knows how belief triggers endorphin release, or why most people can't achieve placebo pain relief simply by willing it. Though scientists don't know exactly how placebos work, they have accumulated a fair bit of knowledge about how to trigger the effect. A London rheumatologist found, for example, that red dummy capsules made more effective painkillers than blue, green or yellow ones. Research on American students revealed that blue pills make better sedatives than pink, a colour more suitable for stimulants. Even branding can make a difference: if Aspro or Tylenol are what you like to take for a headache, their chemically identical generic equivalents may be less effective. It matters, too, how the treatment is delivered. Decades ago, when the major tranquilliser chlorpromazine was being introduced, a doctor in Kansas categorised his colleagues according to whether they were keen on it, openly sceptical of its benefits, or took a "let's try and see" attitude. His conclusion: the more enthusiastic the doctor, the better the drug performed. And this year Ernst surveyed published studies that compared doctors' bedside manners. The studies turned up one consistent finding: "Physicians who adopt a warm, friendly and reassuring manner," he reported, "are more effective than those whose consultations are formal and do not offer reassurance."

Warm, friendly and reassuring are precisely CAM's strong suits, of course. Many of the ingredients of that opening recipe—the physical contact, the generous swathes of time, the strong hints of supernormal healing power—are just the kind of thing likely to impress patients. It's hardly surprising, then, that complementary practitioners are generally best at mobilising the placebo effect, says Arthur Kleinman, professor of social anthropology at Harvard University.

# MULTIPLE CHOICE QUESTIONS

## Mini warm-up practice test – Multiple Choice Questions

### How to Spot a Liar

However much we may abhor it, deception comes naturally to all living things. Birds do it by feigning injury to lead hungry predators away from nesting young. Spider crabs do it by disguise: adorning themselves with strips of kelp and other debris, they pretend to be something they are not – and so escape their enemies. Nature amply rewards successful deceivers by allowing them to survive long enough to mate and reproduce. So it may come as no surprise to learn that human beings- who, according to psychologist Gerald Johnson of the University of South California, or lied to about 200 times a day, roughly one untruth every 5 minutes- often deceive for exactly the same reasons: to save their own skins or to get something they can't get by other means.

But knowing how to catch deceit can be just as important a survival skill as knowing how to tell a lie and get away with it. A person able to spot falsehood quickly is unlikely to be swindled by an unscrupulous business associate or hoodwinked by a devious spouse. Luckily, nature provides more than enough clues to trap dissemblers in their own tangled webs- if you know where to look. By closely observing facial expressions, body language and tone of voice, practically anyone can recognise the tell-tale signs of lying. Researchers are even programming computers – like those used on Lie Detector to get at the truth by analysing the same physical cues available to the naked eye and ear.

“With the proper training, many people can learn to reliably detect lies,” says Paul Ekman, professor of psychology at the University of California, San Francisco, who has spent the past 15 years studying the secret art of deception.

In order to know what kind of Lies work best, successful liars need to accurately assess other people's emotional states. Ackman's research shows that this same emotional intelligence is essential for good lie detectors, too. The emotional state to watch out for is stress, the conflict most liars feel between the truth and what they actually say and do.

Even high-tech lie detectors don't detect lies as such; they merely detect the physical cues of emotions, which may or may not correspond to what the person being tested is saying. Polygraphs, for instance, measure respiration, heart rate and skin conductivity, which tend to increase when people are nervous – as they usually are when lying. Nervous people typically perspire, and the salts contained in perspiration conducts electricity. That's why sudden leap in skin conductivity indicates nervousness -about getting caught, perhaps which makes, in turn, suggest that someone is being economical with the truth. On the other hand, it might also mean that the lights in the television Studio are too hot which is one reason polygraph tests are inadmissible in court. “Good lie detectors don't rely on a single thing” says Ekma ,but interpret clusters of verbal and non-verbal clues that suggest someone might be lying.”

The clues are written all over the face. Because the musculature of the face is directly connected to the areas of the brain that processes emotion, the countenance can be a window to the soul. Neurological studies even suggest that genuine emotions travel different pathways through the brain than insincere ones. If a patient paralyzed by stroke on one side of the face, for example, is asked to smile deliberately, only the mobile side of the mouth is raised. But tell that same person a funny joke, and the patient breaks into a full and spontaneous smile. Very few people -most notably, actors and politicians are able to consciously control all of their facial expressions. Lies can often be caught when the liars true feelings briefly leak through the mask of deception.

We don't think before we feel, Ekman says. “Expressions tend to show up on the face before we're even conscious of experiencing an emotion.” One of the most difficult facial expressions to fake- or conceal, if it's genuinely felt is sadness. When someone is truly sad, the forehead wrinkles with grief and the inner



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corners of the eyebrows are pulled up. Fewer than 15% of the people Ekman tested were able to produce this eyebrow movement voluntarily.

By contrast, the lowering of the eyebrows associated with an angry scowl can be replicated at will but almost everybody. "If someone claims they are sad and the inner corners of their eyebrows don't go up, Ekman says, the sadness is probably false."

The smile, on the other hand, is one of the easiest facial expressions to counterfeit. It takes just two muscles -the zygomaticus major muscles that extend from the cheekbones to the corners of the lips to produce a grin. But there's a catch. A genuine smile affects not only the corners of the lips but also the orbicularis oculi, the muscle around the eye that produces the distinctive "crow's feet" associated with people who laugh a lot. A counterfeit grin can be unmasked if the corners of the lips go up, the eyes crinkle, but the inner corners of the eyebrows are not lowered, a movement controlled by the orbicularis oculi that is difficult to fake. The absence of lowered eyebrows is one reason why the smile looks so strained and stiff

*Choose the correct letter A, B, C or D.*

### **Q1. How does the lie detector work?**

- A. It detects whether one's emotional state is stable.
- B. It detects one's brain activity level.
- C. It detects body behavior during one's verbal response.
- D. It analyses one's verbal response word by word.

### **Q2. Lie detectors can't be used as evidence in a court of law because**

- A. Lights often cause lie detectors to malfunction.
- B. They are based on too many verbal and non-verbal clues.
- C. Polygraph tests are often inaccurate.
- D. There may be many causes of certain body behavior.

### **Q3. Why does the author mention the paralyzed patients?**

- A. To demonstrate how a paralyzed patient smiles
- B. To show the relation between true emotions and body behavior
- C. To examine how they were paralyzed
- D. To show the importance of happiness from recovery

### **Q4. The author uses politicians to exemplify that they can**

- A. Have emotions.
- B. Imitate actors.
- C. Detect other people's lives.
- D. Mask their true feelings.

## TEST 1 – A New Ice Age

William Curry is a serious, sober climate scientist, not an art critic. But he has spent a lot of time perusing Emanuel Gottlieb Leutze's famous painting "George Washington Crossing the Delaware", which depicts a boatload of colonial American soldiers making their way to attack English and Hessian troops the day after Christmas in 1776. "Most people think these other guys in the boat are rowing, but they are actually pushing the ice away," says Curry, tapping his finger on a reproduction of the painting. Sure enough, the lead oarsman is bashing the frozen river with his boot. "I grew up in Philadelphia.

The place in this painting is 30 minutes away by car. I can tell you, this kind of thing just doesn't happen anymore." But it may again soon. And ice-choked scenes, similar to those immortalised by the 16th-century Flemish painter Pieter Brueghel the Elder, may also return to Europe. His works, including the 1565 masterpiece "Hunters in the Snow", make the now-temperate European landscapes look more like Lapland. Such frigid settings were commonplace during a period dating roughly from 1300 to 1850 because much of North America and Europe was in the throes of a little ice age. And now there is mounting evidence that the chill could return. A growing number of scientists believe conditions are ripe for another prolonged cooldown, or small ice age. While no one is predicting a brutal ice sheet like the one that covered the Northern Hemisphere with glaciers about 12,000 years ago, the next cooling trend could drop average temperatures 5 degrees Fahrenheit over much of the United States and 10 degrees in the Northeast, northern Europe, and northern Asia.

"It could happen in 10 years," says Terrence Joyce, who chairs the Woods Hole Physical Oceanography Department. "Once it does, it can take hundreds of years to reverse." And he is alarmed that Americans have yet to take the threat seriously.

A drop of 5 to 10 degrees entails much more than simply bumping up the thermostat and carrying on. Both economically and ecologically, such quick, persistent chilling could have devastating consequences. A 2002 report titled "Abrupt Climate Change: Inevitable Surprises", produced by the National Academy of Sciences, pegged the cost from agricultural losses alone at \$100 billion to \$250 billion while also predicting that damage to ecologies could be vast and incalculable. A grim sampler: disappearing forests, increased housing expenses, dwindling fresh water, lower crop yields, and accelerated species extinctions.

The reason for such huge effects is simple. A quick climate change wreaks far more disruption than a slow one. People, animals, plants, and the economies that depend on them are like rivers; says the report: "For example, high water in a river will pose few problems until the water runs over the bank, after which levees can be breached and massive flooding can occur. Many biological processes undergo shifts at particular thresholds of temperature and precipitation."

Political changes since the last ice age could make survival far more difficult for the world's poor. During previous cooling periods, whole tribes simply picked up and moved south, but that option doesn't work in the modern, tense world of closed borders. "To the extent that abrupt climate change may cause rapid and extensive changes of fortune for those who live off the land, the inability to migrate may remove one of the major safety nets for distressed people," says the report.

But first things first. Isn't the earth actually warming? Indeed it is, says Joyce. 'In his cluttered office, full of soft light from the foggy Cape Cod morning, he explains how such warming could actually be the surprising culprit of the next mini-ice age. The paradox is a result of the appearance over the past 30 years in the North Atlantic of huge rivers of fresh water - the equivalent of a 10-footthick layer - mixed into the salty sea. No one is certain where the fresh torrents are coming from, but a prime suspect is melting Arctic ice, caused by a buildup of carbon dioxide in the atmosphere that traps solar energy.

The freshwater trend is major news in ocean-science circles. Bob Dickson, a British oceanographer who sounded an alarm at a February conference in Honolulu, has termed the drop in salinity and temperature in the Labrador Sea a body of water between northeastern Canada and Greenland that adjoins the Atlantic "arguably the largest full-depth changes observed in the modern instrumental oceanographic record". The trend could cause a little ice age by subverting the northern penetration of Gulf Stream waters. Normally, the

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Gulf Stream, laden with heat soaked up in the tropics, meanders up the east coasts of the United States and Canada. As it flows northward, the stream surrenders heat to the air. Because the prevailing North Atlantic winds blow eastward, a lot of the heat wafts to Europe. That's why many scientists believe winter temperatures on the Continent are as much as 36 degrees Fahrenheit warmer than those in North America at the same latitude. Frigid Boston, for example, lies at almost precisely the same latitude as balmy Rome. And some scientists say the heat also warms Americans and Canadians. "It's a real mistake to think of this solely as a European phenomenon," says Joyce.

Having given up its heat to the air, the now-cooler water becomes denser and sinks into the North Atlantic by a mile or more in a process oceanographers call thermohaline circulation. This massive column of cascading cold is the main engine powering a deep-water current called the Great Ocean Conveyor that snakes through all the world's oceans. But as the North Atlantic fills with fresh water, it grows less dense, making the waters carried northward by the Gulf Stream less able to sink. The new mass of relatively fresh water sits on top of the ocean like a big thermal blanket, threatening the thermohaline circulation. That in turn could make the Gulf Stream slow or veer southward. At some point, the whole system could simply shut down, and do so quickly. "There is increasing evidence that we are getting closer to a transition point, from which we can jump to a new state."

*Choose the correct letter A, B, C or D.*

**Q1. The writer uses paintings in the first paragraph to illustrate**

- A. possible future climate change.
- B. climate change of the last two centuries.
- C. the river doesn't freeze in winter anymore.
- D. how George Washington led his troops across the river.

**Q2. Which of the following do scientists believe to be possible?**

- A. The temperature may drop over much of the Northern Hemisphere.
- B. It will be colder than 12,000 years ago.
- C. The entire Northern Hemisphere will be covered in ice.
- D. Europe will look more like Lapland.

**Q3. Why is it difficult for the poor to survive the next ice age?**

- A. People don't live in tribes anymore.
- B. Politics are changing too fast today.
- C. Abrupt climate change causes people to live off their land.
- D. Migration has become impossible because of closed borders.

**Q4. Why is continental Europe much warmer than North America in winter?**

- A. Wind blows most of the heat of tropical currents to Europe.
- B. Europe and North America are at different latitudes.
- C. The Gulf Stream has stopped yielding heat to the air.
- D. The Gulf Stream moves north along the east coast of North America.

## TEST 2 – Activities for Children

**A.** Twenty-five years ago, children in London walked to school and played in parks and playing fields after school and at the weekend. Today they are usually driven to school by parents anxious about safety and spend hours glued to television screens or computer games. Meanwhile, community playing fields are being sold off to property developers at an alarming rate. 'This change in lifestyle has, sadly, meant greater restrictions on children,' says Neil Armstrong, Professor of Health and Exercise Sciences at the University of Exeter. 'If children continue to be this inactive, they'll be storing up big problems for the future.'

**B.** In 1985, Professor Armstrong headed a five-year research project into children's fitness. The results, published in 1990, were alarming. The survey, which monitored 700 11-16-year-olds, found that 48 per cent of girls and 41 per cent of boys already exceeded safe cholesterol levels set for children by the American Heart Foundation. Armstrong adds, "heart is a muscle and need exercise, or it loses its strength." It also found that 13 per cent of boys and 10 percent of girls were overweight. More disturbingly, the survey found that over a four-day period, half the girls and one-third of the boys did less exercise than the equivalent of a brisk 10-minute walk. High levels of cholesterol, excess body fat and inactivity are believed to increase the risk of coronary heart disease.

**C.** Physical education is under pressure in the UK – most schools devote little more than 100 minutes a week to it in curriculum time, which is less than many other European countries. Three European countries are giving children a head start in PE, France, Austria and Switzerland – offer at least two hours in primary and secondary schools. These findings, from the European Union of Physical Education Associations, prompted specialists in children's physiology to call on European governments to give youngsters a daily PE programme. The survey shows that the UK ranks 13th out of the 25 countries, with Ireland bottom, averaging under an hour a week for PE. From age six to 18 British children received, on average, 106 minutes of PE a week. Professor Armstrong, who presented the findings at the meeting, noted that since the introduction of the national curriculum there had been a marked fall in the time devoted to PE in UK schools, with only a minority of pupils getting two hours a week.

**D.** As a former junior football international, Professor Armstrong is a passionate advocate for sport. Although the Government has poured millions into beefing up sport in the community, there is less commitment to it as part of the crammed school curriculum. This means that many children never acquire the necessary skills to thrive in team games. If they are no good at them, they lose interest and establish an inactive pattern of behaviour. When this is coupled with a poor diet, it will lead inevitably to weight gain. Seventy per cent of British children give up all sport when they leave school, compared with only 20 per cent of French teenagers. Professor Armstrong believes that there is far too great an emphasis on team games at school. "We need to look at the time devoted to PE and balance it between individual and pair activities, such as aerobics and badminton, as well as team sports. "He added that children need to have the opportunity to take part in a wide variety of individual, partner and team sports.

**E.** The good news, however, is that a few small companies and children's activity groups have reacted positively and creatively to the problem. Take That, shouts Gloria Thomas, striking a disco pose astride her minispacehopper. Take That, echo a flock of toddlers, adopting outrageous postures astride their space hoppers. 'Michael Jackson, she shouts, and they all do a spoof fan-crazed shriek. During the wild and chaotic hopper race across the studio floor, commands like this are issued and responded to with untrammelled glee. The sight of 15 bouncing seven-year-olds who seem about to launch into orbit at every bounce brings tears to the eyes. Uncoordinated, loud, excited and emotional, children provide raw comedy.

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F. Any cardiovascular exercise is a good option, and it doesn't necessarily have to be high intensity. It can be anything that gets your heart rate up: such as walking the dog, swimming, miming, skipping, hiking. "Even walking through the grocery store can be exercise," Samis-Smith said. What they don't know is that they're at a Fit Kids class, and that the fun is a disguise for the serious exercise plan they're covertly being taken through. Fit Kids trains parents to run fitness classes for children. 'Ninety per cent of children don't like team sports,' says company director, Gillian Gale.

G. A Prevention survey found that children whose parents keep in shape are much more likely to have healthy body weights themselves. "There's nothing worse than telling a child what he needs to do and not doing it yourself," says Elizabeth Ward, R.D., a Boston nutritional consultant and author of Healthy Foods, Healthy Kids. "Set a good example and get your nutritional house in order first." In the 1930s and '40s, kids expended 800 calories a day just walking, carrying water, and doing other chores, notes Fima Lifshitz, M.D., a pediatric endocrinologist in Santa Barbara. "Now, kids in obese families are expending only 200 calories a day in physical activity," says Lifshitz, "incorporate more movement in your family's lifepark farther away from the stores at the mall, take stairs instead of the elevator, and walk to nearby friends' houses instead of driving."

*Choose the correct letter A, B, C or D.*

**Q1. According to paragraph A, what does Professor Neil Armstrong concern about?**

- A. Spending more time on TV affect academic level
- B. Parents have less time stay with their children
- C. Future health of British children
- D. Increasing speed of property's development

**Q2. What does Armstrong indicate in Paragraph B?**

- A. We need to take a 10 minute walk everyday
- B. We should do more activity to exercise heart
- C. Girls' situation is better than boys
- D. Exercise can cure many disease

**Q3. What is aim of Fit Kids' training?**

- A. Make profit by running several sessions
- B. Only concentrate on one activity for each child
- C. To guide parents how to organize activities for children
- D. Spread the idea that team sport is better

**Q4. What did Lifshitz suggest in the end of this passage?**

- A. Create opportunities to exercise your body
- B. Taking elevator saves your time
- C. Kids should spend more than 200 calories each day
- D. We should never drive but walk

**Q5. What is main idea of this idea?**

- A. health of the children who are overweight is at risk in the future
- B. Children in UK need proper exercises
- C. Government mistaken approach for children
- D. Parents play the most important role in children's activity



## TEST 3 – Tasmanian Tiger

Although it was called tiger, it looked like a dog with black stripes on its back and it was the largest known carnivorous marsupial of modern times. Yet, despite its fame for being one of the most fabled animals in the world, it is one of the least understood of Tasmania's native animals. The scientific name for the Tasmanian tiger is Thylacine and it is believed that they have become extinct in the 20th century. Fossils of thylacines dating from about almost 12 million years ago have been dug up at various places in Victoria, South Australia and Western Australia.

They were widespread in Australia 7,000 years ago, but have probably been extinct on the continent for 2,000 years. This is believed to be because of the introduction of dingoes around 8,000 years ago. Because of disease, thylacine numbers may have been declining in Tasmania at the time of European settlement 200 years ago, but the decline was certainly accelerated by the new arrivals. The last known Tasmanian Tiger died in Hobart Zoo in 1936 and the animal is officially classified as extinct. Technically, this means that it has not been officially sighted in the wild or captivity for 50 years.

However, there are still unsubstantiated sightings. Hans Naarding, whose study of animals had taken him around the world, was conducting a survey of a species of endangered migratory bird. What he saw that night is now regarded as the most credible sighting recorded of thylacine that many believe has been extinct for more than 70 years.

"I had to work at night," Naarding takes up the story. "I was in the habit of intermittently shining a spotlight around. The beam fell on an animal in front of the vehicle, less than 10m away. Instead of risking movement by grabbing for a camera, I decided to register very carefully what I was seeing. The animal was about the size of a small shepherd dog, a very healthy male in prime condition. What set it apart from a dog, though, was a slightly sloping hindquarter, with a fairly thick tail being a straight continuation of the backline of the animal. It had 12 distinct stripes on its back, continuing onto its butt. I knew perfectly well what I was seeing. As soon as I reached for the camera, it disappeared into the tea-tree undergrowth and scrub."

The director of Tasmania's National Parks at the time, Peter Morrow, decided in his wisdom to keep Naarding's sighting of the thylacine secret for two years. When the news finally broke, it was accompanied by pandemonium. "I was besieged by television crews, including four to live from Japan, and others from the United Kingdom, Germany, New Zealand and South America," said Naarding.

Government and private search parties combed the region, but no further sightings were made. The tiger, as always, had escaped to its lair, a place many insist exists only in our imagination. But since then, the thylacine has staged something of a comeback, becoming part of Australian mythology. There have been more than 4,000 claimed sightings of the beast since it supposedly died out, and the average claims each year reported to authorities now number 150. Associate professor of zoology at the University of Tasmania, Randolph Rose, has said he dreams of seeing a thylacine. But Rose, who in his 35 years in Tasmanian academia has fielded countless reports of thylacine sightings, is now convinced that his dream will go unfulfilled.

"The consensus among conservationists is that, usually, any animal with a population base of less than 1,000 is headed for extinction within 60 years," says Rose. "Sixty years ago, there was only one thylacine that we know of, and that was in Hobart Zoo," he says. Dr. David Pemberton, curator of zoology at the Tasmanian Museum and Art Gallery, whose PhD thesis was on the thylacine, says that despite scientific thinking that 500 animals are required to sustain a population, the Florida panther is down to a dozen or so animals and, while it does have some inbreeding problems, is still ticking along. "I'll take a punt and say that, if we manage to find a thylacine in the scrub, it means that there are 50-plus animals out there." After all, animals can be notoriously elusive. The strange fish known as the coelacanth, with its "proto-legs", was thought to have died out along with the dinosaurs 700 million years ago until a specimen was dragged to the surface in a shark net off the south-east coast of South Africa in 1938. Wildlife biologist Nick Mooney has the unenviable task of investigating all "sightings" of the tiger totalling 4,000 since the mid-1980s, and

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averaging about 150 a year. It was Mooney who was first consulted late last month about the authenticity of digital photographic images purportedly taken by a German tourist while on a recent bushwalk in the state. On face value, Mooney says, the account of the sighting, and the two photographs submitted as proof, amount to one of the most convincing cases for the species' survival he has seen.

And Mooney has seen it all—the mistakes, the hoaxes, the illusions and the plausible accounts of sightings. Hoaxers aside, most people who report sightings end up believing they have seen a thylacine, and are themselves believable to the point they could pass a lie-detector test, according to Mooney. Others, having tabled a creditable report, then become utterly obsessed like the Tasmanian who has registered 99 thylacine sightings to date.

Mooney has seen individuals bankrupted by the obsession, and families destroyed. “It is a blind optimism that something is, rather than a cynicism that something isn't,” Mooney says. “If something crosses the road, it's not a case of ‘I wonder what that was?’ Rather, it is a case of ‘that's a thylacine!’ It is a bit like a gold prospector's blind faith, ‘it has got to be there’.” However, Mooney treats all reports on face value. “I never try to embarrass people, or make fools of them. But the fact that I don't pack the car immediately they ring can often be taken as ridicule. Obsessive characters get irate that someone in my position is not out there when they think the thylacine is there.”

But Hans Naarding, whose sighting of a striped animal two decades ago was the highlight of “a life of animal spotting”, remains bemused by the time and money people waste on tiger searches. He says resources would be better applied to saving the Tasmanian devil, and helping migratory bird populations that are declining as a result of shrinking wetlands across Australia. Gould the thylacine still be out there? “Sure,” Naarding says. But he also says any discovery of surviving thylacines would be “rather pointless”. “How do you save a species from extinction? What could you do with it? If there are thylacines out there, they are better off right where they are,”

*Choose the correct letter A, B, C or D.*

**Q1. Hans Naarding's sighting has resulted in**

- A. government and organisations' cooperative efforts to protect thylacine.
- B. extensive interests to find a living thylacine.
- C. increase of the number of reports of thylacine worldwide.
- D. growth of popularity of thylacine in literature.

**Q2. The example of coelacanth is to illustrate**

- A. it lived in the same period with dinosaurs.
- B. how dinosaurs evolved legs.
- C. some animals are difficult to catch in the wild.
- D. extinction of certain species can be mistaken.

**Q3. Mooney believes that all sighting reports should be**

- A. given some credit as they claim even if they are untrue.
- B. acted upon immediately.
- C. viewed as equally untrustworthy.
- D. questioned and carefully investigated.

## TEST 4 – Musical Maladies

Music and the brain are both endlessly fascinating subjects, and as a neuroscientist specialising in auditory learning and memory, I find them especially intriguing. So I had high expectations of Musicophilia, the latest offering from neurologist and prolific author Oliver Sacks. And I confess to feeling a little guilty reporting that my reactions to the book are mixed.

Sacks himself is the best part of Musicophilia. He richly documents his own life in the book and reveals highly personal experiences. The photograph of him on the cover of the book—which shows him wearing headphones, eyes closed, clearly enchanted as he listens to Alfred Brendel perform Beethoven's Pathétique Sonata—makes a positive impression that is borne out by the contents of the book. Sacks's voice throughout is steady and erudite but never pompous. He is neither self-conscious nor self-promoting. The preface gives a good idea of what the book will deliver. In it Sacks explains that he wants to convey the insights gleaned from the “enormous and rapidly growing body of work on the neural underpinnings of musical perception and imagery, and the complex and often bizarre disorders to which these are prone” He also stresses the importance of “the simple art of observation” and “the richness of the human context.” He wants to combine “observation and description with the latest in technology,” he says, and to imaginatively enter into the experience of his patients and subjects. The reader can see that Sacks, who has been practicing neurology for 40 years, is torn between the “old-fashioned” path of observation and the new-fangled, high-tech approach:

He knows that he needs to take heed of the latter, but his heart lies with the former. The book consists mainly of detailed descriptions of cases, most of them involving patients whom Sacks has seen in his practice. Brief discussions of contemporary neuroscientific reports are sprinkled liberally throughout the text. Part I, “Haunted by Music,” begins with the strange case of Tony Cicoria, a nonmusical, middle-aged surgeon who was consumed by a love of music after being hit by lightning. He suddenly began to crave listening to piano music, which he had never cared for in the past. He started to play the piano and then to compose music, which arose spontaneously in his mind in a “torrent” of notes. How could this happen? Was the cause psychological? (He had had a near-death experience when the lightning struck him.) Or was it the direct result of a change in the auditory regions of his cerebral cortex? Electroencephalography (EEG) showed his brain waves to be normal in the mid-1990s, just after his trauma and subsequent “conversion” to music. There are now more sensitive tests, but Cicoria has declined to undergo them; he does not want to delve into the causes of his musicality. What a shame! Part II, “A Range of Musicality,” covers a wider variety of topics, but unfortunately, some of the chapters offer little or nothing that is new. For example, chapter 13, which is five pages long, merely notes that the blind often have better hearing than the sighted. The most interesting chapters are those that present the strangest cases. Chapter 8 is about “amusia,” an inability to hear sounds as music, and “dysharmonia,” a highly specific impairment of the ability to hear harmony, with the ability to understand melody left intact. Such specific “dissociations” are found throughout the cases Sacks recounts. To Sacks's credit, part III, “Memory, Movement and Music,” brings us into the underappreciated realm of music therapy. Chapter 16 explains how “melodic intonation therapy” is being used to help expressive aphasia patients (those unable to express their thoughts verbally following a stroke or other cerebral incident) once again become capable of fluent speech. In chapter 20, Sacks demonstrates the near-miraculous power of music to animate Parkinson's patients and other people with severe movement disorders, even those who are frozen into odd postures. Scientists cannot yet explain how music achieves this effect.

To readers who are unfamiliar with neuroscience and music behavior, Musicophilia may be something of a revelation. But the book will not satisfy those seeking the causes and implications of the phenomena Sacks describes. For one thing, Sacks appears to be more at ease discussing patients than discussing experiments. And he tends to be rather uncritical in accepting scientific findings and theories. It's true that the causes of music-brain oddities remain poorly understood.

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However, Sacks could have done more to draw out some of the implications of the careful observations that he and other neurologists have made and of the treatments that have been successful. For example, he might have noted that the many specific dissociations among components of music comprehension, such as loss of the ability to perceive harmony but not melody, indicate that there is no music center in the brain. Because many people who read the book are likely to believe in the brain localisation of all mental functions, this was a missed educational opportunity.

Another conclusion one could draw is that there seem to be no "cures" for neurological problems involving music. A drug can alleviate a symptom in one patient and aggravate it in another, or can have both positive and negative effects in the same patient. Treatments mentioned seem to be almost exclusively antiepileptic medications, which "damp down" the excitability of the brain in general; their effectiveness varies widely.

Finally, in many of the cases described here the patient with music brain symptoms is reported to have "normal" EEG results. Although Sacks recognizes the existence of new technologies, among them far more sensitive ways to analyze brain waves than the standard neurological EEG test, he does not call for their use. In fact, although he exhibits the greatest com-*passion* for patients, he conveys no sense of urgency about the pursuit of new avenues in the diagnosis and treatment of music-brain disorders. This absence echoes the book's preface, in which Sacks expresses fear that "the simple art of observation may be lost" if we rely too much on new technologies. He does call for both approaches, though, and we can only hope that the neuro logical community will respond.

*Choose the correct letter A, B, C or D.*

**Q1. Why does the writer have a mixed feeling about the book?**

- A. The guilty feeling made him so.
- B. The writer expected it to be better than it was.
- C. Sacks failed to include his personal stories in the book.
- D. This is the only book written by Sacks.

**Q2. What is the best part of the book?**

- A. the photo of Sacks listening to music
- B. the tone of voice of the book
- C. the autobiographical description in the book
- D. the description of Sacks's wealth

**Q3. In the preface, what did Sacks try to achieve?**

- A. make terms with the new technologies
- B. give detailed description of various musical disorders
- C. explain how people understand music
- D. explain why he needs to do away with simple observation

**Q4. What is disappointing about Tony Cicoria's case?**

- A. He refuses to have further tests.
- B. He can't determine the cause of his sudden musicality.
- C. He nearly died because of the lightning.
- D. His brain waves were too normal to show anything.



## **TEST 5 – Antarctica – in from the cold?**

**A.** A little over a century ago, men of the ilk of Scott, Shackleton and Mawson battled against Antarctica's blizzards, cold and deprivation. In the name of Empire and in an age of heroic deeds they created an image of Antarctica that was to last well into the 20th century an image of remoteness, hardship, bleakness and isolation that was the province of only the most courageous of men. The image was one of a place removed from everyday reality, of a place with no apparent value to anyone.

**B.** As we enter the 21st century, our perception of Antarctica has changed. Although physically Antarctica is no closer and probably no warmer, and to spend time there still demands a dedication not seen in ordinary life, the continent and its surrounding ocean are increasingly seen to be an integral part of Planet Earth, and a key component in the Earth System. Is this because the world seems a little smaller these days, shrunk by TV and tourism, or is it because Antarctica really does occupy a central spot on Earth's mantle? Scientific research during the past half century has revealed—and continues to reveal—that Antarctica's great mass and low temperature exert a major influence on climate and ocean circulation, factors which influence the lives of millions of people all over the globe.

**C.** Antarctica was not always cold. The slow break-up of the super-continent Gondwana with the northward movements of Africa, South America, India and Australia eventually created enough space around Antarctica for the development of an Antarctic Circumpolar Current (ACC), that flowed from west to east under the influence of the prevailing westerly winds. Antarctica cooled, its vegetation perished, glaciation began and the continent took on its present-day appearance. Today the ice that overlies the bedrock is up to 4km thick, and surface temperatures as low as -89.2deg C have been recorded. The icy blast that howls over the ice cap and out to sea—the so-called katabatic wind—can reach 300 km/hr, creating fearsome wind-chill effects,

**D.** Out of this extreme environment come some powerful forces that reverberate around the world. The Earth's rotation, coupled to the generation of cells of low pressure off the Antarctic coast, would allow Astronauts a view of Antarctica that is as beautiful as it is awesome. Spinning away to the northeast, the cells grow and deepen, whipping up the Southern Ocean into the mountainous seas so respected by mariners. Recent work is showing that the temperature of the ocean may be a better predictor of rainfall in Australia than is the pressure difference between Darwin and Tahiti—the Southern Oscillation Index. By receiving more accurate predictions, graziers in northern Queensland are able to avoid overstocking in years when rainfall will be poor. Not only does this limit their losses but it prevents serious pasture degradation that may take decades to repair. CSIRO is developing this as a prototype forecasting system, but we can confidently predict that as we know more about the Antarctic and Southern Ocean we will be able to enhance and extend our predictive ability.

**E.** The ocean's surface temperature results from the interplay between deepwater temperature, air temperature and ice. Each winter between 4 and 19 million square km of sea ice form, locking up huge quantities of heat close to the continent. Only now can we start to unravel the influence of sea ice on the weather that is experienced in southern Australia. But in another way the extent of sea ice extends its influence far beyond Antarctica. Antarctic krill the small shrimp-like crustaceans that are the staple diet for baleen whales, penguins, some seals, flighted sea birds and many fish—breed well in years when sea ice is extensive and poorly when it is not. Many species of baleen whales and flighted sea birds migrate between the hemispheres and when the krill are less abundant they do not thrive.



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F. The circulatory system of the world's oceans is like a huge conveyor belt, moving water and dissolved minerals and nutrients from one hemisphere to the other, and from the ocean's abyssal depths to the surface. The ACC is the longest current in the world, and has the largest flow. Through it, the deep flows of the Atlantic, Indian and Pacific Oceans are joined to form part of a single global thermohaline circulation. During winter, the howling katabatics sometimes scour the ice off patches of the sea's surface leaving large ice locked lagoons, or 'polynyas'. Recent research has shown that as fresh sea ice forms, it is continuously stripped away by the wind and may be blown up to 90km in a single day. Since only fresh water freezes into ice, the water that remains becomes increasingly salty and dense, sinking until it spills over the continental shelf. Cold water carries more oxygen than warm water, so when it rises, well into the northern hemisphere, it reoxygenates and revitalises the ocean. The state of the northern oceans, and their biological productivity, owe much to what happens in the Antarctic.

*Choose the correct letter A, B, C or D.*

**Q1. In paragraph B, the author intends to**

- A. show Antarctica has been a central topic of global warming discussion in Mass media.
- B. illustrate how its huge sea ice brings food to millions of lives in the world.
- C. emphasise the significance of Antarctica to the global climate and ocean currents.
- D. illustrate the geographical location of Antarctica as the central spot on Earth.

**Q2. Why should Australian farmers keep an eye on the Antarctic ocean temperature?**

- A. It can help farmers reduce their economic loss.
- B. It allows for recovery of grassland lost to overgrazing.
- C. It can help to prevent animals from dying
- D. It enables astronauts to have a clear view of the Antarctic continent.

**Q3. The decrease in the number of whales and seabirds is due to**

- A. killer whales' activity around Antarctica.
- B. the correlation between sea birds' migration and the salinity level of the ocean.
- C. the lower productivity of food source resulting from less sea ice.
- D. the failure of seals to produce babies.

**Q4. What is the final effect of the katabatic winds?**

- A. Increasing the moving speed of ocean current
- B. Increasing the salt level near ocean surface
- C. Bringing fresh ice into the oceans
- D. Piling up the mountainous ice cap respected by mariners

**Q5. What factor drives Antarctic water to move beyond the continental shelf?**

- A. The increase of salt and density of the water
- B. The decrease of salt and density of the water
- C. The rising temperature due to global warming
- D. The melting of fresh ice into the ocean

## **TEST 6 – The Significant Role of Mother Tongue in Education**

One consequence of population mobility is an increasing diversity within schools. To illustrate, in the city of Toronto in Canada, 58% of kindergarten pupils come from homes where English is not the usual language of communication. Schools in Europe and North America have experienced this diversity for years, and educational policies and practices vary widely between countries and even within countries. Some political parties and groups search for ways to solve the problem of diverse communities and their integration in schools and society. However, they see few positive consequences for the host society and worry that this diversity threatens the identity of the host society.

Consequently, they promote unfortunate educational policies that will make the “problem” disappear. If students retain their culture and language, they are viewed as less capable of identifying with the mainstream culture and learning the mainstream language of the society.

The challenge for educator and policy-makers is to shape the evolution of national identity in such a way that rights of all citizens (including school children) are respected, and the cultural linguistic, and economic resources of the nation are maximised. To waste the resources of the nation by discouraging children from developing their mother tongues is quite simply unintelligent from the point of view of national self-interest. A first step in providing an appropriate education for culturally and linguistically diverse children is to examine what the existing research says about the role of children's mother tongues in their educational development.

In fact, the research is very clear. When children continue to develop their abilities in two or more languages throughout their primary school, they gain a deeper understanding of language and how to use it effectively. They have more practice in processing language, especially when they develop literacy in both. More than 150 research studies conducted during the past 25 years strongly support what Goethe, the famous eighteenth-century German philosopher, once said: the person who knows only one language does not truly know that language. Research suggests that bilingual children may also develop more flexibility in their thinking as a result of processing information through two different languages.

The level of development of children's mother tongue is a strong predictor of their second language development. Children who come to school with a solid foundation in their mother tongue develop stronger literacy abilities in the school language. When parents and other caregivers (e.g. grandparents) are able to spend time with their children and tell stories or discuss issues with them in a way that develops their mother tongue, children come to school well-prepared to learn the school language and succeed educationally. Children's knowledge and skills transfer across languages from the mother tongue to the school language. Transfer across languages can be two-way: both languages nurture each other when the educational environment permits children access to both languages.

Some educators and parents are suspicious of mother tongue-based teaching programs because they worry that they take time away from the majority language. For example, in a bilingual program when 50% of the time is spent teaching through children's home language and 50% through the majority language, surely children won't progress as far in the latter? One of the most strongly established findings of educational research, however, is that well-implemented bilingual programs can promote literacy and subject-matter knowledge in a minority language without any negative effects on children's development in the majority language. Within Europe, the Foyer program in Belgium, which develops children's speaking and literacy abilities in three languages (their mother tongue, Dutch and French), most clearly illustrates the benefits of bilingual and trilingual education (see Cummins, 2000).

It is easy to understand how this happens. When children are learning through a minority language, they are learning concepts and intellectual skills too. Pupils who know how to tell the time in their mother tongue understand the concept of telling time. In order to tell time in the majority language, they do not need to re-learn the concept. Similarly, at more advanced stages, there is transfer across languages in other skills such as knowing how to distinguish the main idea from the supporting details of a written passage or story,

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and distinguishing fact from opinion. Studies of secondary school pupils are providing interesting findings in this area, and it would be worth extending this research.

Many people marvel at how quickly bilingual children seem to “pick up” conversational skills in the majority language at school (although it takes much longer for them to catch up with native speakers in academic language skills). However, educators are often much less aware of how quickly children can lose their ability to use their mother tongue, even in the home context. The extent and rapidity of language loss will vary according to the concentration of families from a particular linguistic group in the neighborhood. Where the mother tongue is used extensively in the community, then language loss among young children will be less. However, where language communities are not concentrated in particular neighborhoods, children can lose their ability to communicate in their mother tongue within 2-3 years of starting school. They may retain receptive skills in the language but they will use the majority language, in speaking with their peers and siblings and in responding to their parents. By the time children become adolescents, the linguistic division between parents and children has become an emotional chasm. Pupils frequently become alienated from the cultures of both home and school with predictable results.

*Choose the correct letter A, B, C or D.*

**Q1. What point did the writer make in the second paragraph?**

- A. Some present studies on children's mother tongues are misleading
- B. A culturally rich education programme benefits some children more than others.
- C. Bilingual children can make a valuable contribution to the wealth of a country.
- D. The law on mother tongue use at school should be strengthened

**Q2. Why does the writer refer to something that Goethe said?**

- A. to lend weight to his argument
- B. to contradict some research
- C. to introduce a new concept
- D. to update current thinking

**Q3. The writer believes that when young children have a firm grasp of their mother tongue**

- A. they can teach older family members what they learnt at school
- B. they go on to do much better throughout their time at school.
- C. they can read stories about their cultural background.
- D. they develop stronger relationships with their family than with their peers

**Q4. Why are some people suspicious about mother tongue-based teaching programmes?**

- A. They worry that children will be slow to learn to read in either language.
- B. They think that children will confuse words in the two languages.
- C. They believe that the programmes will make children less interested in their lessons.
- D. They fear that the programmes will use up valuable time in the school day.

## TEST 7 – Global Warming in New Zealand

For many environmentalists, the world seems to be getting warmer. As the nearest country of South Polar Region, New Zealand has maintained an upward trend in its average temperature in the past few years. However, the temperature in New Zealand will go up 4°C in the next century while the polar region will go up more than 6°C. The different pictures of temperature stem from its surrounding ocean which acts like the air conditioner. Thus New Zealand is comparatively fortunate.

Scientifically speaking, this temperature phenomenon in New Zealand originated from what researchers call “SAM” (Southern Annular Mode), which refers to the wind belt that circles the Southern Oceans including New Zealand and Antarctica. Yet recent work has revealed that changes in SAM in New Zealand have resulted in a weakening of moisture during the summer, and more rainfall in other seasons. A bigger problem may turn out to be heavier droughts for agricultural activities because of more water loss from soil, resulting in poorer harvest before winter when the rainfall arrive too late to rescue.

Among all the calamities posed by drought, moisture deficit ranks the first. Moisture deficit is the gap between the water plants need during the growing season and the water the earth can offer. Measures of moisture deficit were at their highest since the 1970s in New Zealand. Meanwhile, ecological analyses clearly show moisture deficit is imposed at different growth stage of crops. If moisture deficit occurs around a crucial growth stage, it will cause about 22% reduction in grain yield as opposed to moisture deficit at vegetative phase.

Global warming is not only affecting agriculture production. When scientists say the country's snow pack and glaciers are melting at an alarming rate due to global warming, the climate is putting another strain on the local places. For example, when the development of global warming is accompanied by the falling snow line, the local skiing industry comes into a crisis. The snow line may move up as the temperature goes up, and then the snow at the bottom will melt earlier. Fortunately, it is going to be favorable for the local skiing industry to tide over tough periods since the quantities of snowfall in some areas are more likely to increase.

What is the reaction of glacier region? The climate change can be reflected in the glacier region in southern New Zealand or land covered by ice and snow. The reaction of a glacier to a climatic change involves a complex chain of processes. Over time periods of years to several decades, cumulative changes in mass balance cause volume and thickness changes, which will affect the flow of ice via altered internal deformation and basal sliding. This dynamic reaction finally leads to glacier length changes, the advance or retreat of glacier tongues. Undoubtedly, glacier mass balance is a more direct signal of annual atmospheric conditions.

The latest research result of National Institute of Water and Atmospheric (NIWA) Research shows that glaciers line keeps moving up because of the impacts of global warming. Further losses of ice can be reflected in Mt. Cook Region. By 1996, a 14 km long sector of the glacier had melted down forming a melt lake (Hooker Lake) with a volume. Melting of the glacier front at a rate of 40 m/yr will cause the glacier to retreat at a rather uniform rate. Therefore, the lake will continue to grow until it reaches the glacier bed.

A direct result of the melting glaciers is the change of high tides the serves the main factor for sea level rise. The trend of sea level rise will bring a threat to the groundwater system for its hyper-saline groundwater and then pose a possibility to decrease the agricultural production. Many experts believe that the best way to counter this trend is to give a longer-term view of sea level change in New Zealand. Indeed, the coastal boundaries need to be upgraded and redefined.

There is no doubt that global warming has affected New Zealand in many aspects. The emphasis on the global warming should be based on the joints efforts of local people and experts who conquer the tough period. For instance, farmers are taking a long term, multi-generational approach to adjust the breeds and

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species according to the temperature. Agriculturists also find ways to tackle the problems that may bring to the soil. In broad terms, going forward, the systemic resilience that's been going on a long time in the ecosystem will continue.

How about animals' reaction? Experts have surprisingly realized that animals have unconventional adaptation to global warming. A study has looked at sea turtles on a few northern beaches in New Zealand and it is very interesting to find that sea turtles can become male or female according to the temperature. Further researches will try to find out how rising temperatures would affect the ratio of sex reversal in their growth. Clearly, the temperature of the nest plays a vital role in the sexes of the baby turtles.

Tackling the problems of global warming is never easy in New Zealand, because records show the slow process of global warming may have a different impact on various regions. For New Zealand, the emission of carbon dioxide only accounts for 0.5% of the world's total, which has met the governmental standard. However, New Zealand's effort counts only a tip of the iceberg. So far, global warming has been a world issue that still hangs in an ambiguous future.

*Choose the correct letter A, B, C or D.*

### **Q1. What is the main idea of the first paragraph?**

- A. The temperature in the polar region will increase less than that in New Zealand in the next century.
- B. The weather and climate of New Zealand is very important to its people because of its close location to the polar region.
- C. The air condition in New Zealand will maintain a high quality because of the ocean.
- D. The temperature of New Zealand will increase less than that of other region in the next 100 years because it is surrounded by sea.

### **Q2. What is one effect of the wind belt that circles the Southern Oceans?**

- A. New Zealand will have more moisture in winds in summer.
- B. New Zealand needs to face droughts more often in hotter months in a year.
- C. Soil water will increase as a result of weakening moisture in the winds.
- D. Agricultural production will be reduced as a result of more rainfall in other seasons.

### **Q3. What does "moisture deficit" mean to the grain and crops?**

- A. The growing condition will be very tough for crops.
- B. The growing season of some plants can hardly be determined.
- C. There will be a huge gap between the water plants needed and the water the earth can offer.
- D. The soil of the grain and crops in New Zealand reached its lowest production since 1970s.

### **Q4. Cumulative changes over a long period of time in mass balance will lead to**

- A. Alterations in the volume and thickness of glaciers.
- B. Faster changes in internal deformation and basal sliding.
- C. Larger length of glaciers.
- D. Retreat of glacier tongues as a result of change in annual atmospheric conditions.

### **Q5. Why does the writer mention NIWA in the sixth paragraph?**

- A. To use a particular example to explain the effects brought by glacier melting.
- B. To emphasize the severance of the further loss of ice in Mt. Cook Region.
- C. To alarm the reader of melting speed of glaciers at a uniform rate.
- D. To note the lake in the region will be disappear when it reach the glacier bed.



## TEST 8 - Motivating Drives

Scientists have been researching the way to get employees motivated for many years. This research in a relational study which builds the fundamental and comprehensive model for study. This is especially true when the business goal is to turn unmotivated teams into productive ones. But their researchers have limitations. It is like studying the movements of car without taking out the engine.

Motivation is what drives people to succeed and plays a vital role in enhancing an organizational development. It is important to study the motivation of employees because it is related to the emotion and behavior of employees. Recent studies show there are four drives for motivation. They are the drive to acquire, the drive to bond, the drive to comprehend and the drive to defend.

**The Drive to Acquire.** The drive to acquire must be met to optimize the acquire aspect as well as the achievement element. Thus the way that outstanding performance is recognized, the type of perks that is provided to polish the career path. But sometimes a written letter of appreciation generates more motivation than a thousand dollar check, which can serve as the invisible power to boost business engagement. Successful organizations and leaders not only need to focus on the optimization of physical reward but also on moving other levers within the organization that can drive motivation.

**The Drive to Bond.** The drive to bond is also key to driving motivation. There are many kinds of bonds between people, like friendship, family. In company, employees also want to be an essential part of company. They want to belong to the company. Employees will be motivated if they find personal belonging to the company. In the meantime, the most commitment will be achieved by the employee on condition that the force of motivation within the employee affects the direction, intensity and persistence of decision and behavior in company.

**The Drive to Comprehend.** The drive to comprehend motivates many employees to higher performance. For years, it has been known that setting stretch goals can greatly impact performance. Organizations need to ensure that the various job roles provide employees with simulation that challenges them or allow them to grow. Employees don't want to do meaningless things or monotonous job. If the job didn't provide them with personal meaning and fulfillment, they will leave the company.

**The Drive to Defend.** The drive to defend is often the hardest lever to pull. This drive manifests itself as a quest to create and promote justice, fairness, and the ability to express ourselves freely. The organizational lever for this basic human motivator is resource allocation. This drive is also met through an employee feeling connection to a company. If their companies are merged with another, they will show worries.

Two studies have been done to find the relations between the four drives and motivation. The article based on two studies was finally published in Harvard Business Review. Most authors' arguments have laid emphasis on four-drive theory and actual investigations. Using the results of the surveys which executed with employees from Fortune 500 companies and other two global businesses (P company and H company), the article mentions about how independent drives influence employees' behavior and how organizational levers boost employee motivation.

The studies show that the drive to bond is most related to fulfilling commitment, while the drive to comprehend is most related to how much effort employees spend on works. The drive to acquire can be satisfied by a rewarding system which ties rewards to performances, and gives the best people opportunities for advancement. For drive to defend, a study on the merging of P company and H company shows that employees in former company show an unusual cooperating attitude.

The key to successfully motivate employees is to meet all drives. Each of these drives is important if we are to understand employee motivation. These four drives, while not necessarily the only human drives, are the ones that are central to unified understanding of modern human life.

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Choose the correct letter A, B, C or D.

**Q1. According to the passage, what are we told about the study of motivation?**

- A. The theory of motivating employees is starting to catch attention in organizations in recent years.
- B. It is very important for managers to know how to motivate their subordinates because it is related to the salary of employees.
- C. Researchers have tended to be too theoretical to their study.
- D. The goal of employee motivation is to increase the profit of organizations

**Q2. What can be inferred from the passage about the study of people's drives?**

- A. Satisfying employees' drives can positively lead to the change of behavior.
- B. Satisfying employees' drives will negatively affect their emotions.
- C. Satisfying employees' drives can increase companies' productions.
- D. Satisfying employees' drives will result in employees' outstanding performance.

**Q3. According to paragraph three, in order to optimize employees' performance, are needed.**

- A. Drive to acquire and achievement element
- B. Outstanding performance and recognition
- C. Career fulfillment and a thousand dollar check
- D. Financial incentive and recognition

**Q4. According to paragraph five, how does "the drive to comprehend" help employees perform better?**

- A. It can help employees better understand the development of their organizations.
- B. It can help employees feel their task in meaningful to their companies.
- C. It can help employees set higher goals.
- D. It can provide employees with repetitive tasks.

**Q5. According to paragraph six, which of following is true about "drive to defend"?**

- A. Organizational resource is the most difficult to allocate.
- B. It is as difficult to implement as the drive to comprehend.
- C. Employees think it is very important to voice their own opinions.
- D. Employees think it is very important to connect with a merged corporation.

## TEST 9 – Texting the Television

**A.** Once upon a time, if a television show with any self-respect wanted to target a young audience, it needed to have an e-mail address. However, in Europe's TV shows, such addresses are gradually substituted by telephone numbers so that audiences can text the show from their mobile phones. Therefore, it comes as no shock that according to Gartner's research, texting has recently surpassed Internet usage across Europe. Besides, among the many uses of text messaging, one of the fastest-growing uses is to interact with television. The statistics provided by Gartner can display that 20% of French teenagers, 11% in Britain and 9% in Germany have responded to TV programmes by sending a text message.

**B.** This phenomenon can be largely attributed to the rapid growth of reality TV shows such as 'Big Brother', where viewers get to decide the result through voting. The majority of reality shows are now open to text-message voting, and in some shows like the latest series of Norway's 'Big Brother', most votes are collected in this manner. But TV-texting isn't just about voting. News shows encourage viewers to, comment by texting messages; game shows enable the audience to be part of the competition; music shows answer requests by taking text messages; and broadcasters set up on-screen chatrooms. TV audiences tend to sit on the sofa with their mobile phones right by their sides, and 'it's a supernatural way to interact.' says Adam Daum of Gartner.

**C.** Mobile service providers charge appreciable rates for messages to certain numbers, which is why TV-texting can bring in a lot of cash. Take the latest British series of 'Big Brother' as an example. It brought about 5.4m textmessage votes and £1.35m (\$2,1m) of profit. In Germany, MTV's 'Videoclash' encourages the audience to vote for one of two rival videos, and induces up to 40,000 texts per hour, and each one of those texts costs €0.30 (\$0.29), according to a consultancy based in Amsterdam. The Belgian quiz show '1 Against 100' had an eight-round texting match on the side, which brought in 110,000 participants in one month, and each of them paid €0.50 for each question. In Spain, a cryptic-crossword clue invites the audience to send their answers through text at the expense of €1, so that they can be enrolled in the poll to win a €300 prize. Normally, 6,000 viewers would participate within one day. At the moment, TV-related text messaging takes up a considerable proportion of mobile service providers' data revenues. In July, Mm02 (a British operator) reported an unexpectedly satisfactory result, which could be attributed to the massive text waves created by 'Big Brother'. Providers usually own 40%-50% of the profits from each text, and the rest is divided among the broadcaster, the programme producer and the company which supplies the messageprocessing technology. So far, revenues generated from text messages have been an indispensable part of the business model for various shows. Obviously, there has been grumbling that the providers take too much of the share. Endemol, the Netherlands-based production firm that is responsible for many reality TV, shows including 'Big Brother', has begun constructing its own database for mobile-phone users. It plans to set up a direct billing system with the users and bypass the providers.

**D.** How come the joining forces of television and text message turn out to be this successful? One crucial aspect is the emergence of one-of-a-kind four-, five- or six-digit numbers known as 'short codes'. Every provider has control over its own short codes, but not until recently have they come to realise that it would make much more sense to work together to offer short codes compatible with all networks. The emergence of this universal short codes was a game-changer, because short codes are much easier to remember on the screen, according to Lars Becker of Flytxt, a mobile-marketing company.

**E.** Operators' co-operation on enlarging the market is by a larger trend, observes Katrina Bond of Analysys, a consultancy. When challenged by the dilemma between holding on tight to their margins and permitting the emergence of a new medium, no provider has ever chosen the latter WAP, a technology for

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mobile-phone users to read cut-down web pages on their screens, failed because of service providers' reluctance towards revenue sharing with content providers. Now that they've learnt their lesson, they are altering the way of operating. Orange, a French operator, has come such a long way as to launch a rate card for sharing revenue of text messages, a new level of transparency that used to be unimaginable.

**F.** At a recent conference, Han Weegink of CMG, a company that offers the television market text-message infrastructure, pointed out that the television industry is changing in a subtle yet fundamental way. Instead of the traditional one-way presentation, more and more TV shows are now getting viewers' reactions involved. Certainly, engaging the audiences more has always been the promise of interactive TV. An interactive TV was originally designed to work with exquisite set-top devices, which could be directly plugged into the TV. However, as Mr Daum points out, that method was flawed in many ways. Developing and testing software for multiple and incompatible types of set-top box could be costly, not to mention that the 40% (or lower) market penetration is below that of mobile phones (around 85%). What's more, it's quicker to develop and set up apps for mobile phones. 'You can approach the market quicker, and you don't have to go through as many greedy middlemen,' Mr Daum says. Providers of set-top box technology are now adding texting function to the design of their products.

**G.** The triumph of TV-related texting reminds everyone in the business of how easily a fancy technology can all of a sudden be replaced by a less complicated, lower-tech method. That being said, the old-fashioned approach to interactive TV is not necessarily over; at least it proves that strong demands for interactive services still exist. It appears that the viewers would sincerely like to do more than simply staring at the TV screen. After all, couch potatoes would love some thumb exercises.

*Choose the correct letter A, B, C or D.*

**Q1. In Europe, a research hints that young audiences spend more money on**

- A. thumbing text messages.
- B. writing e-mails.
- C. watching TV programmes.
- D. talking through mobile phones.

**Q2. What would happen when reality TV shows invite the audience to vote?**

- A. Viewers would get attractive bonus.
- B. They would be part of the competition.
- C. Their questions would be replied.
- D. Their participation could change the result.

**Q3. Interactive TV will change from concentrating on set-top devices to**

- A. increasing their share in the market.
- B. setting up a modified set-top box.
- C. building an embedded message platform.
- D. marching into the European market.

## TEST 10 – Designed to Last: Could better Design Cure Our Throwaway Culture?

Jonathan Chapman, a senior lecturer at the University of Brighton, UK, is one of a new breed of 'sustainable designers'. Like many of us, they are concerned about the huge waste associated with Western consumer culture and the damage this does to the environment. Some, like Chapman, aim to create objects we will want to keep rather than discard. Others are working to create more efficient or durable consumer goods, or goods designed with recycling in mind. The waste entailed in our fleeting relationships with consumer durables is colossal.

Domestic power tools, such as electric drills, are a typical example of such waste. However much DIY the purchaser plans to do, the truth is that these things are thrown away having been used, on average, for just ten minutes. Most will serve 'conscience time', gathering dust on a shelf in the garage; people are reluctant to admit that they have wasted their money. However, the end is inevitable: thousands of years in land-fill waste sites. In its design, manufacture, packaging, transportation and disposal, a power tool consumes many times its own weight of resources, all for a shorter active lifespan than that of the average small insect.

To understand why we have become so wasteful, we should look to the underlying motivation of consumers. "People own things to give expression to who they are, and to show what group of people they feel they belong to," Chapman says. In a world of mass production, however, that symbolism has lost much of its potency. For most of human history, people had an intimate relationship with objects they used or treasured. Often they made the objects themselves, or family members passed them on. For more specialised objects, people relied on expert manufacturers living close by, whom they probably knew personally. Chapman points out that all these factors gave objects a history — a narrative — and an emotional connection that today's mass-produced goods cannot possibly match. Without these personal connections, consumerist culture idolizes novelty instead. People know that they cannot buy happiness, but the chance to remake themselves with glossy, box-fresh products seems irresistible. When the novelty fades, they simply renew the excitement by buying more.

Chapman's solution is what he calls 'emotionally durable design'. He says the challenge for designers is to create things we want to keep. This may sound like a tall order but it can be surprisingly straightforward. A favorite pair of old jeans, for example, just do not have the right feel until they have been worn and washed a hundred times. It is as if they are sharing the wearer's life story. The look can be faked, but it is simply not the same. Walter Stahel, visiting professor at the University of Surrey, UK, calls this 'the teddy bear factor'. No matter how ragged and worn a favorite teddy becomes, we don't rush out and buy another one. As adults, our teddy bear connects us to our childhood and this protects it from obsolescence. Stahel argues that this is what sustainable design needs to do with more products. The information age was supposed to lighten our economies and reduce our impact on the environment, but, in fact, the reverse seems to be happening. We have simply added information technology to the industrial era and speeded up the developed world's metabolism. The cure is hardly rocket science: minimise waste, stop moving things around so much and use people more. So what will post-throwaway consumerism look like? It might be as simple as installing energy-saving light bulbs, more efficient washing machines or choosing locally produced groceries with less packaging. In general, we will spend less on goods and more on services. Instead of buying a second car, for example, we might buy into a car-sharing network. Rather than following our current wasteful practices, we will buy less and rent a lot more; why own things such as tools that you use infrequently, especially things are likely to be updated all the time?

Consumer durables will increasingly be sold with plans for their disposal. Electronic goods such as mobile phones will be designed to be recyclable, with the extra cost added into the retail price. Following Chapman's notion of emotionally durable design, there will be a move away from mass production and towards tailor-made articles and products designed and manufactured with greater craftsmanship, products



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which will be repaired rather than replaced, in the same way as was done in our grandparents' time. Companies will replace profit from bulk sales by servicing and repairing products chosen because we want them to last.

Chapman acknowledges that it will be a challenge to persuade people to buy fewer goods, and ones that they intend to keep. At the moment, price competition between retailers makes it cheaper for consumers to replace rather than repair. Products designed to be durable and emotionally satisfying are likely to be more expensive, so how will we be persuaded to choose sustainability? Tim Cooper, from Sheffield Hallam University in the UK, points out that many people are already happy to pay a premium for quality, and that they also tend to value and care more for expensive goods. Chapman is also positive: "People are ready to keep things for longer," he says, "The problem is that a lot of industries don't know how to do that." Chapman believes that sustainable design is here to stay. "The days when large corporations were in a position to choose whether to jump on the sustainability band-wagon or not are coming to an end," he says. Whether this is also the beginning of the end of the throwaway society remains to be seen.

*Choose the correct letter A, B, C or D.*

**Q1. In the second paragraph, the expression 'conscience time' refers to the fact that the owners**

- A. wish they had not bought the power tool.
- B. want to make sure the tool is stored safely.
- C. feel that the tool will increase in value in the future.
- D. would feel guilty if they threw the tool away immediately.

**Q2. Jonathan Chapman uses the word 'narrative' in the third paragraph to refer to the fact that the owner**

- A. told a story about how the item was bought.
- B. was aware of how the item had come into being.
- C. felt that the item became more useful over time.
- D. was told that the item had been used for a long time.

**Q3. In the third paragraph, the writer suggests that mass-produced goods are**

- A. inferior in quality.
- B. less likely to be kept for a long time.
- C. attractive because of their lower prices.
- D. less tempting than goods which are traditionally produced.

**Q4. Lack of personal connection to goods is described as producing**

- A. a belief that older goods are superior.
- B. an attraction to well-designed packaging.
- C. a desire to demonstrate status through belongings.
- D. a desire to purchase a constant stream of new items.

**Q5. Jeans and teddy bears are given as examples of goods which**

- A. have been very well designed.
- B. take a long time to show wear.
- C. are valued more as they grow older.
- D. are used by the majority of the population.

## MATCHING NAMES

### Mini warm-up practice test – Match names

Match each statement with the correct person.

<b>List of People</b> A. Simon Hartwell B. Brian Johnson C. Thomas Cooper D. Rebecca Thompson	1. Opportunities to fund expenses through casual work increase the volume of visitors to a particular destination. 2. Attitude to the tourism industry of the local people has had a positive impact on visitor numbers 3. Diverse attractions mean a destination is able to appeal to a wider range of people 4. Motivations for different approaches to travel by different generations
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#### The world is our oyster

**A.** Independent travel is on the increase and while package holidays which offer an all inclusive price for transport, accommodation and often even food are financially attractive to many, according to tourism analyst Thomas Cooper, an increasing number of people now prefer a less-tailored holiday and the freedom to make spur of the moment decisions and changes to their intended plan.

**B.** Internet based information sites about backpacking destinations are prolific and publications aimed at independent travellers on a budget exist for almost every destination imaginable. Some people, particularly first-time backpackers, may elect to travel with a friend or acquaintance; however, a large percentage of backpackers travel alone, assured by the knowledge that they are likely to meet, with ease, a number of like-minded individuals throughout their journey and staying in their backpacker accommodation. Alan Park, who has travelled extensively through Europe, Australasia and several other parts of the globe, says most accommodation establishments aimed at the backpacker market are designed with communal kitchens, dormitories and entertainment areas which lend themselves to allowing residents to socialize with ease and quickly breakdown barriers with strangers that may usually exist in day to day life.

**C.** Many backpackers of European origin are attracted to the Southern Hemisphere, Australia being a major destination of choice. Cooper attributes this high level of interest to the possibilities of legal working holiday visas for many nationalities and consequent short-term work opportunities making extended travel financially feasible, in addition to the attractive climate and outback appeal. Australia also has the reputation of being a relatively safe destination, with a warm and jovial population and its size and contrast between locations is alluring to many. University student Rebecca Thompson, who has just returned from a twelve month overseas trip, says that the cosmopolitan and modern nature of Australian cities such as Sydney and Melbourne contrasted with the rugged outback appeal of Western Australia and the Northern Territory, or the marine paradise of the Great Barrier Reef offer sufficient variation to attract a wide base of visitors. Sydney based travel consultant Brad Connor advises that it is also possible to obtain bargain deals on internal flights within this massive island when purchasing an international ticket, highly recommended, he says, for those who do not have the luxury of a long length of time, in order to ensure that key spots can be visited.

**D.** Equal in popularity to Australia, for the backpacking market is South East Asia and Rebecca Thompson says that, in her experience, the majority of travellers on extended trips to Australasia also include a visit to one or more South East Asia destinations in their itinerary. Thailand, in particular, has a long tourism history and well-established service industry. It is often considered one of the more accessible

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Asian destinations for the novice European backpacker due to its reasonable prices, large volume of Western visitors and well established backpacker trails. Brian Johnson, who is currently employed by the British Consulate in Bangkok, believes that the welcoming nature and level of English spoken by Thais involved in the tourism industry has also impacted positively on the destination's overseas image. Thai food is delicious and now fairly familiar to those outside the country and while precautions such as drinking bottled water and washing of fruit and vegetables should be practiced, generally standards of accommodation and restaurants are high. Thomas Cooper says Thailand's attractions are wide ranging, encompassing idyllic beaches, an insight into Buddhist culture and impressive ancient temples, mountain trekking, a vibrant nightlife and for bargain hunters bustling night markets and bazaars.

**E.** South East Asia neighbour, Vietnam, alongside its rapidly developing economy has also over recent years established a solid tourism industry, the majority of visitors entering and exiting by plane via its urban centres Ho Chi Minh (formerly Saigon) in the south and Hanoi in the north. Vietnam offers incredible vistas and contrasts of rugged mountain areas, lush green rice paddies, crystal clear waters and dense forest areas. Alan Park, who spent a month travelling independently around the country, says bus and rail networks allow visitors to travel from centre to centre relatively inexpensively, though he does not recommend these forms of transport to visitors on a short time-frame as the pace is unhurried.

**F.** The list of potentially safe and enjoyable backpacking destinations is endless. Technology and transport developments over recent time have resulted in more areas of the world becoming increasingly accessible, it is now possible to keep in regular contact with friends and family back home via email or even mobile phone, providing added reassurance to those concerned about travelling and their worried parents. Brian Johnson says friends, family and acquaintances who have previously travelled to the destination of choice are a useful source of first-hand advice and information and Simon Hartwell of the Backpackers Association adds travellers are advised to ensure that they are aware of visa requirements for their destination and are urged to seek medical advice regarding any necessary vaccinations or medical precautions. It is always wise to be as well informed as possible prior to embarking on a trip.

**G.** The youth of today are undoubtedly becoming more adventurous, which Hartwell ascribes to higher disposable income in the developed world than were available to previous generations and also the fact that we can more easily familiarise ourselves with the unknown via the internet and other communication methods. Many travellers, particularly experienced backpackers, are keen to experience more obscure destinations well off the well-trodden backpacker trail.

## TEST 1 - How did writing begin?

### Many theories few answers?

Match each statement with the correct person.

**NB** You can use any letter **more than once**.

<b>List of People</b>	<b>1.</b> There is no proof that early writing is connected to decorate household objects.
<b>A.</b> Dr Holly Pittman	<b>2.</b> As writing developed, it came to represent speech.
<b>B.</b> Dr Peter Damerow	<b>3.</b> Sumerian writing developed into a means of political control.
<b>C.</b> Dr Denise Schmandt Besserat	<b>4.</b> Early writing did not represent the grammatical features of speech.
<b>D.</b> Dr Piotr Michalowski	<b>5.</b> There is no convincing proof that tokens and signs are connected.
<b>E.</b> Dr Pascal Vernus	<b>6.</b> The uses of cuneiform writing were narrow at first, and later widened.

The Sumerians, an ancient people of the Middle East, had a story explaining the invention of writing more than 5,000 years ago. It seems a messenger of the King of Uruk arrived at the court of a distant ruler so exhausted that he was unable to deliver the oral message. So the king set down the words of his next messages on a clay tablet. A charming story, whose retelling at a recent symposium at the University of Pennsylvania amused scholars. They smiled at the absurdity of a letter which the recipient would not have been able to read. They also doubted that the earliest writing was a direct rendering of speech. Writing more likely began as a separate, symbolic system of communication and only later merged with spoken language.

Yet in the story the Sumerians, who lived in Mesopotamia, in what is now southern Iraq, seemed to understand writing's transforming function. As Dr Holly Pittman, director of the University's Center for Ancient Studies, observed, writing 'arose out of the need to store and transmit information over time and space'.

In exchanging interpretations and information, the scholars acknowledged that they still had no fully satisfying answers to the questions of how and why writing developed. Many favoured an explanation of writings origins in the visual arts, pictures becoming increasingly abstract and eventually representing spoken words. Their views clashed with a widely held theory among archaeologists that writing developed from the pieces of clay that Sumerian accountants used as tokens to keep track of goods. Archaeologists generally concede that they have no definitive answer to the question of whether writing was invented only once, or arose independently in several places, such as Egypt, the Indus Valley, China, Mexico and Central America. The preponderance of archaeological data shows that the urbanizing Sumerians were the first to develop writing, in 3,200 or 3,300 BC. These are the dates for many clay tablets in an early form of cuneiform, a script written by pressing the end of a sharpened stick into wet clay, found at the site of the ancient city of Uruk. The baked clay tablets bore such images as pictorial symbols of the names of people, places and things connected with government and commerce. The Sumerian script gradually evolved from the pictorial to the abstract, but did not at first represent recorded spoken language.

**Cuneiform Writing.** Dr Peter Damerow, a specialist in Sumerian cuneiform at the Max Planck Institute for the History of Science in Berlin, said, 'It is likely that there were mutual influences of writing systems around the world. However, their great variety now shows that the development of writing, once initiated, attains a considerable degree of independence and flexibility to adapt to specific characteristics of the sounds of the language to be represented.' Not that he accepts the conventional view that writing started as a representation of words by pictures. New studies of early Sumerian writing, he said, challenge this interpretation. The structures of this earliest writing did not, for example, match the structure of spoken language, dealing mainly in lists and categories rather than in sentences and narrative. For at least two decades, Dr Denise Schmandt-Besserat, a University of Texas archaeologist, has argued that the first writing grew directly out of a system practised by Sumerian accountants. They used clay tokens, each one shaped to represent a jar of oil, a container of grain or a particular kind of livestock. These tokens were sealed inside clay spheres, and then the number and type of tokens inside was recorded on the outside using impressions

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resembling the tokens. Eventually, the token impressions were replaced with inscribed signs, and writing had been invented.

Though Dr Schmandt-Besserat has won much support, some linguists question her thesis, and others, like Dr Pittman, think it too narrow. They emphasise that pictorial representation and writing evolved together. 'There's no question that the token system is a forerunner of writing' Dr Pittman said, 'but I have an argument with her evidence for a link between tokens and signs, and she doesn't open up the process to include picture making.'

Dr Schmandt Besserat vigorously defended her ideas. 'My colleagues say that pictures were the beginning of writing,' she said, 'but show me a single picture that becomes a sign in writing. They say that designs on pottery were the beginning of writing, but show me a single sign of writing you can trace back to a pot — it doesn't exist'. In its first 500 years, she asserted, cuneiform writing was used almost solely for recording economic information, and after that its uses multiplied and broadened.

Yet other scholars have advanced different ideas Dr Piotr Michalowski, Professor of Near East Civilizations at the University of Michigan, said that the proto—writing of Sumerian Uruk was 'so radically different as to be a complete break with the past'. It no doubt served, he said, to store and communicate information, but also became a new instrument of power.

Some scholars noted that the origins of writing may not always have been in economics. In Egypt, most early writing is high on monuments or deep in tombs. In this case, said Dr Pascal Vernus from a university in Paris, early writing was less administrative than sacred. It seems that the only certainty in this field is that many questions remain to be answered.



## TEST 2 – Storytelling

Match each statement with the correct person.

<b>List of People</b> A. Hernadi B. Mink C. Plotkin D. Mithen E. Edelman F. Holyoak and Thagard G. Carruthers H. Albertus	<ol style="list-style-type: none"><li>1. Early European storytelling came about because of a traditional form of memorising...</li><li>2. Cognitive fluidity allowed early humans to make and change arrangements</li><li>3. Telling stories allows us to relate to our surroundings</li><li>4. The brain changes our recollections of past events to match our current circumstances</li><li>5. Telling stories is a trait which is common to all nations</li><li>6. Early humans became more inventive when they were able to make a connection between different ideas</li><li>7. Your memory of something will be improved if you visualise it rather than just listen to it</li><li>8. Humans adjust to their surroundings as well as changing them</li></ol>
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Dr Tom Sjoblom, University of Helsinki, explores the link between narratives and memories. Storytelling seems to be a fundamental feature of human existence. In a recent article, Paul Hernadi points out that storytelling and narratives are such widespread phenomenon that they could justifiably be included in a list of human universals (Hernadi, 2001). But our craving for narratives or stories, goes deeper than this. It is embedded in our mental images of whatever happens around us (Boyer, 2001). In other words, creating narratives is our way of connecting and interacting with our environment (Mink, 1978).

As a species, we humans appear to have a much more active attitude towards our environment than any other species. Our bodies and minds not only adapt to the surrounding world, but we actually shape and construct our environment to better suit our needs (Plotkin, 1983). From this perspective, culture is nothing more than an environment that we create ourselves. Culture is not something in opposition to nature. Instead it is a part of it; It is - in a way – nature modified to better suit the requirements of the human life form. Thus, culture and all aspects of it are basically products of natural selection and, more specifically, the evolution of the human mind (Boyer, 2001).

Between 60,000 and 20,000 years ago the first sign of art and religion appeared and humans started to build houses and invent more sophisticated tools and weapons, such as bows and arrows. This period has been called the ‘big bang’ of human culture. There is still much controversy on how to explain this period of innovation, but a growing consensus connects the greater cultural energy and innovation of the period to the emergence of individuals as creative beings (Mellars, 1994)

The archaeologist Steven Miller has suggested that this creativity can be explained by the emergence of a ‘cognitively fluid’ mentality. In other words, the ability to link together information from different areas of our life. Cognitive fluidity makes it possible for human beings to emerge from the concrete situational present and to adopt a more general and abstract approach (Mithen, 1996). As Gerald Edelman puts it, ‘With that ability come the abilities to model the world, to make explicit comparisons and to weigh outcomes; through such comparisons comes the ability of reorganising plans.’ (Edelman, 1992) Edelman goes further than this and argues that it is the flexibility of our memory system which is the key to understanding how cognitive fluidity affects our ability to learn new things in general (Edelman, 1992). The basic idea here is that our memory does not really represent the past as it happened. In most of the cases, it does not even represent it as it is stored and coded into our brains. Instead, our memory prefers creating the past from the perspective of how relevant it is to our present situation. Striving for this kind of coherence, our mind combines stored representations and blends information stored in them (Holyoak and Thagard, 1995). Thus, all things being equal, we do not remember the past, we create it. The medieval art of memory, known as *memoria*, has interested historians for a long time, but seldom from a psychological or cognitive perspective.

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Recently, this has been changed by the work of Mary Carruthers. According to Carruthers, memoria was the reason why literature, in its fundamental sense existed in medieval Europe. It was the process by which a work of literature became both institutionalised by the group and learned by its individual members (Carruthers, 1990)

For those medieval experts who were educated in the art of memory there were two principal strategies for achieving their goal. The first and older of these strategies, attributed to Aristotle, relied on the concept of 'mental images'. Supporters of this strategy argued that remembering was to see mental pictures, which are firmly imprinted upon the memory. Thus the best way to memorise narratives is to stimulate the act of memorising by using visual aids such as emotion-provoking representations, or so-called 'word pictures'. Descriptive language can also be used to create a kind of mental painting, although no actual pictures are present (Carruthers, 1990). As Albertus Magnus (1193-1280) puts it: 'something is not secure enough by hearing, but it is made firm by seeing' (Albertus I. 1. II. 6-7)

The second, and more popular, strategy for memorising narratives was rote learning. This was achieved by the frequent repetition of a text until it was accurately memorised. In this case, the process of memorising was aided by the use of rhythmic and/or formulaic expressions, and by breaking longer texts into numbered segments and then memorizing them one by one (Carruthers, 1990).

The followers of this strategy criticised the use of visual imagery because of its inaccuracy. It was argued that the use of visual aids was marginally helpful at best, providing cues for recollection, but could not in itself guarantee the accuracy of the memorising process (Carruthers, 1990). The latter countered the criticism by arguing that, while in ordinary circumstances the accuracy of visual imagery could not be trusted, this problem would disappear if the visual imagery was strong enough to make a person emotionally engaged with the text. Indeed, they argued, it is the creation of strong emotional responses that makes the use of visual images such a powerful tool for memory creation (Carruthers, 1990).

## TEST 3 – Changing Rules of Health Treatment

Match each statement with the correct person.

<b>List of People</b> A. Michael Rawlins B. Steve Webb C. Jonathan Ellis	<ol style="list-style-type: none"><li>1. This person was happy that NICE realised age discrimination needed dealing with.</li><li>2. This person holds a very high position in the NICE agency.</li><li>3. This person is a member of a political party.</li><li>4. This person says their policy regarding age is precise and easy to understand.</li><li>5. This person does not agree with the position taken by NICE.</li><li>6. This person feels the NHS must further improve its relations with the elderly.</li><li>7. This person says that NICE does not discriminate on the grounds of age.</li></ol>
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People who are grossly overweight, who smoke heavily or drink excessively could be denied surgery or drugs. The National Institute for Health and Clinical Excellence (NICE), which advises on the clinical and cost effectiveness of treatments for the National Health Service (NHS) in the UK, said that in some cases the- 'self-inflicted' nature of an illness should be taken into account.

NICE stressed that people should not be discriminated against by doctors simply because they smoke or were overweight. Its ruling should apply only if the treatment was likely to be less effective, or not work because of an unhealthy habit. The agency also insisted that its decision was not an edict for the whole NHS but guidance for its own appraisal committees when reaching judgements on new drugs or procedures. But the effect is likely to be the same.

NICE is a powerful body and the cause of much controversy. It is seen by some as a new way of rationing NHS treatment. Across the UK, primary care trusts (PCTs) regularly wait for many months for a NICE decision before agreeing to fund a new treatment. One group of primary care trusts is ahead of NICE. Three PCTs in east Suffolk have already decided that obese people would not be entitled to have hip or knee replacements unless they lost weight. The group said the risks of operating on them were greater, the surgery may be less successful and the joints would wear out sooner. It was acknowledged that the decision would also save money.

NICE said no priority should be given to patients based on income, social class or social roles at different ages when considering the cost effectiveness of a treatment. Patients should not be discriminated against on the grounds of age either, unless age has a direct relevance to the condition. NICE has already ruled that IVF should be available on the NHS to women aged 23 to 39 as the treatment has less chance of success in older women. It also recommends that flu drugs should be available to over 65s, as older people are more vulnerable.

But NICE also said that if self-inflicted factors meant that drugs or treatment would be less clinically and cost effective, this may need to be considered when producing advice for the NHS. They state that 'if the self inflicted cause of the condition will influence the likely outcome of its particular treatment, then it may be appropriate to take this into account in some circumstances'. They acknowledge that it can be difficult to decide whether an illness such as a heart attack was self-inflicted in a smoker. 'A patient's individual circumstances may only be taken into account when there will be an impact on the clinical and cost effectiveness of the treatment.

Prof Sir Michael Rawlins, the chairman of NICE, said: 'On age we are very clear our advisory groups should not make recommendations that depend on people's ages when they are considering the use of its particular treatment, unless there is clear evidence of a difference in its effectiveness for particular age groups. Even then, age should only be mentioned when it provides the only practical 'market of risk or benefit. NICE values people, equally, at all ages'. But Steve Webb, the Liberal Democrat health spokesman, said there was a danger of primary care trusts following the same course of action. 'There is no excuse for

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cashstrapped hospitals denying treatment to people whose lifestyle they disapprove of, he said. 'Treatment decisions involving people's lifestyle should be based on clinical reasons, not grounds of cost.'

The NHS is there to keep people healthy, not to sit in judgement on individual lifestyles. A spokesman for NICE said: 'We want to reassure people not in producing our guidance we are not going to take into consideration whether or not a particular condition was or is self-inflicted. The only circumstance where that may be taken into account is where that treatment may be less effective because of lifestyle choices'.

Jonathan Ellis, the policy manager at Help the Aged, said it was pleased NICE had finally shown an understanding of the importance of tackling age discrimination. 'While this is a major feat there is still some way to go to banish the evident inherent age discrimination that exists within health care services,' he said. 'The NHS now has much to learn. It will ensure it fairer deal all round for older people using the NHS.'

## TEST 4 – To MBA or not to MBA

Match each statement with the correct person.

<b>List of People</b> A. Anthony Hesketh B. Carol Blackman C. Nunzio Quacquarelli D. Nic Beech	<ol style="list-style-type: none"><li>1. Employees with postgraduate qualifications earn more because they are older and expect more.</li><li>2. It can be difficult to convince an employer that the extra time spent at university was necessary.</li><li>3. One type of course focuses on a particular aspect of business, whereas the other is more general in approach.</li><li>4. Graduates who have neither worked in nor studied business are suited to our programme.</li><li>5. There is evidence that companies may prefer to employ people without a masters degree.</li></ol>
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‘You could be forgiven for thinking just about every man and his dog has an MBA these days,’ says Anthony Hesketh, of Lancaster University management school. We know what he means. Such is the worldwide growth and awareness of the MBA that this icon of career advancement and high salaries has almost become synonymous with postgraduate education in the business sector.

In reality, many postgraduate alternatives to an MBA exist. The total number of MBA programmes worldwide is around 2,400, while other masters and advanced courses in the whole spectrum of business education add up to more than 10,000.

Two key distinctions exist in matching what aspiring students want with what the universities offer: first is generalization versus specialization, and second is pre-experience versus post-experience and the two distinctions are interlinked. Carol Blackman, of the University of Westminster school of business, explains the first distinction. ‘Specialist masters programmes are designed either for career preparation in a clearly defined type of job or profession, or are intended to develop or enhance professional competence in individuals who are already experienced. The aim is to increase the depth of their knowledge in the specialist area. The MBA, on the other hand, is a general management programme which provides practising managers with an opportunity for personal development with a broadly-based introduction to all management subject areas and the theory and practice of management’.

Specialist knowledge, however, is not everything when it comes to finding a job. Surveys by the UK’s Association of Graduate Recruiters (AGR) repeatedly confirm that what employers seek, and continue to find scarce, are the personal skills that will make graduates valuable employees. In fact, when recruiting new graduates most employers considered these skills more important than specialist knowledge. What employers seek most from new graduates are enthusiasm and self-motivation, interpersonal skills, team working and good oral communication.

Of the nineteen skills considered important in AGR’s 2002 survey, just three require specialist education numeracy, computer literacy and foreign languages – and these are low on the list. Nunzio Quacquarelli, chief executive of topcareers.net, takes this further. ‘Clearly, salary differentials for those with a second degree, but no significant work experience, do not match those of a good MBA and a number of years in the workplace. According to the AGR research, about 14% of employers offered a better salary to those new graduates with a masters or even a doctorate. In my view, the salary improvement of 10% to 15% largely reflects the recruit’s age and earning expectancy rather than the increase in human capital perceived by the employer. Contrast this with our latest topmba.com MBA Recruiters Survey results which shows that the average salary paid to an MBA with good work experience in the US and Europe is US\$80,000 – around two and a half times the average starting salary for a young postgraduate.’

Anthony Hesketh poses the question whether holding a second degree may even be a disadvantage. ‘I have seen many reports over the years suggesting that employers view postgraduates as eminently less employable than those with a first degree. Drive, motivation and career focus, not to mention ability, are



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what employers value and are prepared to pay for. A postgraduate immediately has an uphill task explaining an additional year; or three years, of study.'

This view may seem cynical, but, if you are about to graduate and are considering a further degree, you should take the realities into account and ask yourself some hard questions:

- Is the qualification I am considering going to impress employers?
- Is it going to give me the edge over less qualified candidates?
- Is my consideration of a second degree because I am not sure of my career direction?
- Will employers consider that I lack drive and ambition because I have deferred my attempts to find

a worthwhile job?

Many postgraduate options exist that can help you to acquire the personal skills that employers in the world of business are seeking. Consider, for example, the offerings of Strathclyde and Durham universities. According to Dr Nic Beech, of the University of Strathclyde graduate school of business: 'The MSc in business management (MBM), offered at USGSB is suitable for students with a good first degree particularly a non-business first degree — but little or no business experience. Our MBM offers these graduates the opportunity to combine the specialization of their first degree with a general management qualification — something employers recognize produces a well-rounded individual.

Graduates tell us that the MBM allows them to access sectors previously out of reach. It is designed to develop the business knowledge, practical experience and personal skills which employers are seeking.' At the University of Durham business school, Sheena Maberly is careers development officer; she too sees high value in qualifications such as the Durham MA in management (DMAM).

She says: 'Whatever your first degree, from anthropology to zoology, a postgraduate business degree can help you gain a competitive edge in an over-crowded job market. If you're just starting out in your career, a business master's degree like the DMAM will enable you to develop skills directly relevant to employers' needs. So, extending your studies into management can make you better equipped to 'hit the ground running' — and that's what employers expect. Recruiters are highly selective and a vocational qualification is additional evidence of motivation.

Before committing yourself to postgraduate study, weigh up the options. Perhaps the best route might be to take a job now and plan to do an MBA a few years down the line? Try to get sponsorship from a company. Or go for a well-researched and thoroughly thought through masters that will help you land a good job. Ultimately the choice is yours, but focus on the future, and on your target employer's expectations.

## TEST 5 – The Origins of Laughter

Match each statement with the correct person.

**NB** You can use any letter **more than once**.

<b>List of People</b> A. Provine B. Zimmerman C. Panksepp D. Flamson	<ol style="list-style-type: none"><li>1. Babies and some animals produce laughter which sounds similar.</li><li>2. Primates are not the only animals who produce laughter.</li><li>3. Laughter can be used to show that we feel safe and secure with others.</li><li>4. Most human laughter is not a response to a humorous situation.</li><li>5. Animal laughter evolved before human laughter.</li><li>6. Laughter is a social activity.</li></ol>
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*While joking and wit are uniquely human inventions, laughter certainly is not. Other creatures, including chimpanzees, gorillas and even rats, laugh. The fact that they laugh suggests that laughter has been around for a lot longer than we have.*

There is no doubt that laughing typically involves groups of people. "Laughter evolved as a signal to others — it almost disappears when we are alone," says Robert Provine, a neuroscientist at the University of Maryland. Provine found that most laughter comes as a polite reaction to everyday remarks such as "see you later", rather than anything particularly funny. And the way we laugh depends on the company we're keeping. Men tend to laugh longer and harder when they are with other men, perhaps as a way of bonding. Women tend to laugh more and at a higher pitch when men are present, possibly indicating flirtation or even submission.

To find the origins of laughter, Provine believes we need to look at play. He points out that the masters of laughing are children, and nowhere is their talent more obvious than in the boisterous antics, and the original context is play. Well-known primate watchers, including Dian Fossey and Jane Goodall, have long argued that chimps laugh while at play. The sound they produce is known as a pant laugh. It seems obvious when you watch their behavior — they even have the same ticklish spots as we do. But after removing the context, the parallel between human laughter and a chimp's characteristic pant laugh is not so clear. When Provine played a tape of the pant laughs to 119 of his students, for example, only two guessed correctly what it was.

These findings underline how chimp and human laughter vary- When we laugh the sound is usually produced by chopping up a single exhalation into a series of shorter with one sound produced on each inward and outward breath. The question is: does this pant laughter have the same source as our own laughter? New research lends weight to the idea that it does. The findings come from Elke Zimmerman, head of the Institute for Zoology in Germany, who compared the sounds made by babies and chimpanzees in response to tickling during the first year of; their life. Using sound spectrographs to reveal the pitch and intensity of vocalizations, she discovered that chimp and human baby laughter follow broadly the same pattern.

Zimmerman believes the closeness of baby laughter to chimp laughter supports the idea that laughter was around long before humans arrived on the scene. What started simply as a modification of breathing associated with enjoyable and playful interactions has acquired a symbolic meaning as an indicator of pleasure.

Pinpointing when laughter developed is another matter. Humans and chimps share a common ancestor that lived perhaps 8 million years ago, but animals might have been laughing long before that. More distantly related primates, including gorillas, laugh, and anecdotal evidence suggests that other social mammals can do too.

Scientists are currently testing such stories with a comparative analysis of just how common laughter is among animals. So far, though, the most compelling evidence for laughter beyond primates comes from

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research done by Jaak Panksepp from Bowling Green State University, Ohio, into the ultrasonic chirps produced by rats during play and in response to tickling.

All this still doesn't answer the question of why we laugh at all. One idea is that laughter and tickling originated as a way of sealing the relationship between mother and child. Another is that the reflex response to tickling is protective, alerting us to the presence of crawling creatures that might harm us or compelling us to defend the parts of our bodies that are most vulnerable in hand-to-hand combat. But the idea that has gained the most popularity in recent years is that laughter in response to tickling is a way for two individuals to signal and test their trust in one another.

This hypothesis starts from the observation that although a little tickle can be enjoyable, if it goes on too long it can be torture. By engaging in a bout of tickling, we put ourselves at the mercy of another individual, and laughing is what makes it a reliable signal of trust, according to Tom Flamson, a laughter researcher at the University of California, Los Angeles. "Even in rats, laughter, tickle, play and trust are linked. Rats chirp a lot when they play," says Flamson. "These chirps can be aroused by tickling. And they get bonded to us as a result, which certainly seems like a show of trust."

We'll never know which animal laughed the first laugh, or why. But we can be sure it wasn't in response to a prehistoric joke. The funny thing is that while the origins of laughter are probably quite serious, we owe human laughter and our language based humor to the same unique skill. While other animals pant, we alone can control our breath well enough to produce the sound of laughter. Without that control there would also be no speech — and no jokes to endure.

## TEST 6 – Sunset for the Oil Business

Match each statement with the correct person.

<b>List of People</b>	<b>1.</b> has found fault in geological research procedure.
<b>A.</b> Colin Campbell	<b>2.</b> has provided the longest-range forecast regarding oil supply.
<b>B.</b> M. King Hubbert	<b>3.</b> has convinced others that oil production will follow a particular model.
<b>C.</b> Kenneth Deffeyes	<b>4.</b> has accused fellow scientists of refusing to see the truth.
<b>D.</b> Rene Dahan	<b>5.</b> has expressed doubt over whether improved methods of extracting oil are possible.
<b>E.</b> Michael Lynch	

*The world is about to run out of oil. Or perhaps not. It depends whom you believe.*

Members of Oil Depletion Analysis Centre (ODAC) recently met in London and presented technical data that support their grim forecast that the world is perilously close to running out of oil. Leading lights of this movement, including Colin Campbell, rejected rival views presented by American Geological Survey and the International Energy Agency (IEA) that contradicted their views. Dr Campbell even decried the "amazing display of ignorance, deliberate ignorance, denial and obfuscation" by governments, industry and academics on this topic.

So is the oil really running out? The answer is easy: Yes. Nobody seriously disputes the notion that oil is, for all practical purposes, a non-renewable resource that will run out some day, be that years or decades away. The harder question is determining when precisely oil will begin to get scarce. And answering that question involves scaling Hubbert's peak.

M. King Hubbert, a Shell geologist of legendary status among depletion experts, forecast in 1956 that oil production in the United States would peak in the early 1970s and then slowly decline, in something resembling a bell-shaped curve. At the time, his forecast was controversial, and many rubbished it. After 1970, however, empirical evidence proved him correct: oil production in America did indeed peak and has been in decline ever since.

Dr Hubbert's analysis drew on the observation that oil production in a new area typically rises quickly at first, as the easiest and cheapest reserves are tapped. Over time, reservoirs age and go into decline, and so lifting oil becomes more expensive. Oil from that area then becomes less competitive in relation to other sources of fuel. As a result, production slows down and usually tapers off and declines. That, he argued, made for a bell-shaped curve.

His successful prediction has emboldened a new generation of geologists to apply his methodology on a global scale. Chief among them are the experts at ODAC, who worry that the global peak in production will come in the next decade. Dr Campbell used to argue that the peak should have come already; he now thinks it is just round the corner. A heavyweight has now joined this gloomy chorus. Kenneth Deffeyes of Princeton University argues in a lively new book that global oil production could peak within the next few years.

That sharply contradicts mainstream thinking. America's Geological Survey prepared an exhaustive study of oil depletion last year that put the peak of production some decades off. The IEA has just weighed in with its new "World Energy Outlook" which foresees enough oil to comfortably meet demand to 2020 from remaining reserves. Rene Dahan, one of ExxonMobil's top managers, goes further: with an assurance characteristic of the world's largest energy company, he insists: that the world will be awash in oil for another 70 years. Who is right?

In making sense of these wildly opposing views, it is useful to look back at the pitiful history of oil forecasting. Doomsters have been predicting dry wells since the 1970s, but so far the oil is still gushing. Nearly all the predictions for 2000 made after the 1970s oil shocks were far too pessimistic. Michael Lynch of DRI-WEFA, an economic consultancy, is one of the few oil forecasters who has got things generally right. In a new paper, Dr Lynch analyses those historical forecasts. He finds evidence of both bias and

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recurring errors, which suggests that methodological mistakes (rather than just poor data) were the problem. In particular, he criticized forecasters who used Hubbert-style analysis for relying on fixed estimates of how much "ultimately recoverable" oil there really is below ground. That figure, he insists, is actually a dynamic one, as improvements in infrastructure, knowledge and technology raise the amount of oil which is recoverable.

That points to what will probably determine whether the pessimists or the optimists are right: technological innovation. The first camp tends to be dismissive of claims of forthcoming technological revolutions in such areas as deep-water drilling and enhanced recovery. Dr Deffeyes captures this end-of-technology mindset well. He argues that because the industry has already spent billions on technology development, it makes it difficult to ask today for new technology, as most of the wheels have already been invented.

Yet techno-optimists argue that the technological revolution in oil has only just begun. Average recovery rates (how much of the known oil in a reservoir can actually be brought to the surface) are still only around 30-35%. Industry optimists believe that new techniques on the drawing board today could lift that figure to 50-60% within a decade.

Given the industry's astonishing track record of innovation, it may be foolish to bet against it. That is the result of adversity: the oil crisis of the 1970s forced Big Oil to develop reserves in expensive, inaccessible places such as the North Sea and Alaska, undermining Dr Hubbert's assumption that cheap reserves are developed first. The resulting upstream investments have driven down the cost of finding and developing wells over the last two decades from over \$20 a barrel to around \$6 a barrel. The cost of producing oil has fallen by half, to under \$4 a barrel.

Such miracles will not come cheap, however, since much of the world's oil is now produced in ageing fields that are rapidly declining. The IEA concludes that global oil production need not peak in the next two decades if the necessary investments are made. So how much is necessary? If oil companies are to replace the output lost at those ageing fields and meet the world's ever-rising demand for oil, the agency reckons they must invest \$1 trillion in 1 non-OPEC countries over the next decade alone. Ouch.



## TEST 7 – History of Refrigeration

Match each statement with the correct person.

<b>List of People</b> A. Thomas Moore B. Frederick Tudor C. Carl Von Linde D. Nathaniel Wyeth E. J.B. Sutherland F. Fred Jones G. Parker Earle	<ol style="list-style-type: none"><li>1. patented the idea that refrigerating system can be installed on tramcars</li><li>2. invented an ice-cutting technical method that could save money and time</li><li>3. enabled the cold storage technology to be applied in fruit</li><li>4. invented a cooling device applied into the trucking industry</li><li>5. created a new technique to liquefy the air</li></ol>
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Refrigeration is a process of removing heat, which means cooling an area or a substance below the environmental temperature. Mechanical refrigeration makes use of (the evaporation of a liquid refrigerant, which goes through a cycle so that it can be reused. The main cycles include vapour-compression, absorption steam-jet or steam-ejector, and airing. The term 'refrigerator' was first introduced by a Maryland farmer Thomas Moore in 1803, but it is in the 20th century that the appliance we know today first appeared.

People used to find various ways to preserve their food before the advent of mechanical refrigeration systems. Some preferred using cooling systems of ice or snow, which meant that diets would have consisted of very little fresh food or fruits and vegetables, but mostly of bread, cheese and salted meals. For milk and cheeses, it was very difficult to keep them fresh, so such foods were usually stored in a cellar or window box. In spite of those measures, they could not survive rapid spoilage. Later on, people discovered that adding such chemical as sodium nitrate or potassium nitrate to water could lead to a lower temperature. In 1550 when this technique was first recorded, people used it to cool wine, as was the term 'to refrigerate'. Cooling drinks grew very popular in Europe by 1600, particularly in Spain, France, and Italy. Instead of cooling water at night, people used a new technique: rotating long-necked bottles of water which held dissolved saltpeter. The solution was intended to create very low temperatures and even to make ice. By the end of the 17th century, iced drink including frozen juices and liquors had become extremely fashionable in France.

People's demand for ice soon became strong. Consumers' soaring requirement for fresh food, especially for green vegetables, resulted in reform in people's dieting habits between 1830 and the American Civil War, accelerated by a drastic expansion of the urban areas and the rapid amelioration in an economy of the populace. With the growth of the cities and towns, the distance between the consumer and the source of food was enlarged. In 1799 as a commercial product, ice was first transported out of Canal Street in New York City to Charleston, South Carolina. Unfortunately, this transportation was not successful because when the ship reached the destination, little ice left. Frederick Tudor and Nathaniel Wyeth, two New England businessmen, grasped the great potential opportunities for ice business and managed to improve the storage method of ice in the process of shipment. The acknowledged 'Ice King' in that time, Tudor concentrated his efforts on bringing the ice to the tropical areas. In order to achieve his goal and guarantee the ice to arrive at the destination safely he tried many insulating materials in an experiment and successfully constructed the ice containers, which reduce the ice loss from 66 per cent to less than 8 per cent drastically. Wyeth invented an economical and speedy method to cut the ice into uniform blocks, which had a tremendous positive influence on the ice industry. Also, he improved the processing techniques for storing, transporting and distributing ice with less waste.

When people realised that the ice transported from the distance was not as clean as previously thought and gradually caused many health problems, it was more demanding to seek the clean natural sources of ice. To make it worse, by the 1890s water pollution and sewage dumping made clean ice even more unavailable. The adverse effect first appeared in the brewing industry, and then seriously spread to such sectors as meat packing and dairy industries. As a result, the clean, mechanical refrigeration was considerably in need.

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Many inventors with creative ideas took part in the process of inventing refrigeration, and each version was built on the previous discoveries. Dr William Cullen initiated to study the evaporation of liquid under the vacuum conditions in 1720. He soon invented the first man-made refrigerator at the University of Glasgow in 1748 with the employment of ethyl ether boiling into a partial vacuum. American inventor Oliver Evans designed the refrigerator firstly using vapour rather than liquid in 1805. Although his conception was not put into practice in the end the mechanism was adopted by an American physician John Gorrie, who made one cooling machine similar to Evans' in 1842 with the purpose of reducing the temperature of the patient with yellow fever in a Florida hospital. Until 1851, Evans obtained the first patent for mechanical refrigeration in the USA. In 1820, Michael Faraday, a Londoner, first liquefied ammonia to cause cooling. In 1859, Ferdinand Carre from France invented the first version of the ammonia water cooling machine. In 1873, Carl von Linde designed the first practical and portable compressor refrigerator in Munich, and in 1876 he abandoned the methyl ether system and began using ammonia cycle. Linde later created a new method ('Linde technique') for liquefying large amounts of air in 1894. Nearly a decade later, this mechanical refrigerating method was adopted subsequently by the meat packing industry in Chicago.

Since 1840, cars with the refrigerating system had been utilised to deliver and distribute milk and butter. Until 1860, most seafood and dairy products were transported with cold-chain logistics. In 1867, refrigerated, railroad cars are patented to J.B, Sutherland from Detroit, Michigan, who invented insulated cars by installing the ice bunkers at the end of the cars: air came in from the top, passed through the bunkers, circulated through the cars by gravity and controlled by different quantities of hanging flaps which caused different air temperatures. Depending on the cargo (such as meat, fruits etc.) transported by the cars, different car designs came into existence. In 1867, the first refrigerated car to carry fresh fruit was manufactured by Parker Earle of Illinois, who shipped strawberries on the Illinois Central Railroad. Each chest was freighted with 100 pounds of ice and 200 quarts of strawberries. Until 1949, the trucking industry began to be equipped with the refrigeration system with a roof-mounted cooling device, invented by Fred Jones.

From the late 1800s to 1929, the refrigerators employed toxic gases – methyl chloride, ammonia, and sulfur dioxide - as refrigerants. But in the 1920s, a great number of lethal accidents took place due to the leakage of methyl chloride out of refrigerators. Therefore, some American companies started to seek some secure methods of refrigeration. Frigidaire detected a new class of synthetic, refrigerants called halocarbons or CFCs (chlorofluorocarbons) in 1928. this research led to the discovery of chlorofluorocarbons (Freon), which quickly became the prevailing material in compressor refrigerators. Freon was safer for the people in the vicinity, but in 1973 it was discovered to have detrimental effects on the ozone layer. After that, new improvements were made, and Hydrofluorocarbons, with no known harmful effects, was used in the cooling system. Simultaneously, nowadays, Chlorofluorocarbons (CFS) are no longer used; they are announced illegal in several places, making the refrigeration far safer than before.

## TEST 8 – Education Philosophy

Match each statement with the correct person.

**NB** You can use any letter **more than once**.

<b>List of People</b> A. Jean Jacques Rousseau B. Johan Heinrich Pestalozzi C. Jean Marc Gaspard Itard D. Friedrich Froebel	1. was not successful to prove the theory 2. observed a child's record 3. requested a study setting with emotional comfort firstly 4. proposed that corruption was not a characteristic in people's nature 5. was responsible for an increase in the number of a type of school
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**A.** Although we lack accurate statistics about child mortality in the pre-industrial period, we do have evidence that in the 1660s, the mortality rate for children who died within 14 days of birth was as much as 30 per cent. Nearly all families suffered some premature death. Since all parents expected to bury some of their children, they found it difficult to invest in their newborn children. Moreover, to protect themselves from the emotional consequences of children's death, parents avoided making any emotional commitment to an infant. It is no wonder that we find mothers leave their babies in gutters or refer to the death in the same paragraph with reference to pickles.

**B.** The 18th century witnessed the transformation from an agrarian economy to an industrial one, one of the vital social changes taking place in the Western world. An increasing number of people moved from their villages and small towns to big cities where life was quite different. Social supports which had previously existed in smaller communities were replaced by ruthless problems such as poverty, crime, substandard housing and disease. Due to the need for additional income to support the family, young children from the poorest families were forced into early employment and thus their childhood became painfully short. Children as young as 7 might be required to work full-time, subjected to unpleasant and unhealthy circumstances, from factories to prostitution. Although such a role has disappeared in most wealthy countries, the practice of childhood employment still remains a staple in underdeveloped countries and rarely disappeared entirely.

**C.** The lives of children underwent a drastic change during the 1800s in the United States. Previously, children from both rural and urban families were expected to participate in everyday labour due to the bulk of manual hard working. Nevertheless, thanks to the technological advances of the mid-1800s, coupled with the rise of the middle class and redefinition of roles of family members, work and home became less synonymous over time. People began to purchase toys and books for their children. When the country depended more upon machines, children in rural and urban areas, were less likely to be required to work at home. Beginning from the Industrial Revolution and rising slowly over the course of the 19th century, this trend increased exponentially after civil war. John Locke, one of the most influential writers of his period, created the first clear and comprehensive statement of the 'environmental position' that family education determines a child's life, and via this, he became the father of modern learning theory. During the colonial period, his teachings about child care gained a lot of recognition in America.

**D.** According to Jean Jacques Rousseau, who lived in an era of the American and French Revolution, people were 'noble savages' in the original state of nature, meaning they are innocent, free and uncorrupted. In 1762, Rousseau wrote a famous novel Emile to convey his educational philosophy through a story of a boy's education from infancy to adult-hood. This work was based on his extensive observation of children and adolescents, their individuality, his developmental theory and on the memories of his own childhood. He contrasts children with adults and describes their age-specific characteristics in terms of historical perspective and developmental psychology. Johan Heinrich Pestalozzi, living during the early stages of the

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Industrial Revolution, sought to develop schools to nurture children's all-round development. He agreed with Rousseau that humans are naturally good but were spoiled by a corrupt society. His approach to teaching consists of the general and special methods, and his theory was based upon establishing an emotionally healthy homelike learning environment, which had to be in place before more specific instructions occurred.

**E.** One of the best-documented cases of Pestalozzi's theory concerned a so-called feral child named Victor, who was captured in a small town in the south of France in 1800. Prepubescent, mute, naked, and perhaps 11 or 12 years old, Victor had been seen foraging for food in the gardens of the locals in the area and sometimes accepted people's direct offers of food before his final capture. Eventually, he was brought to Paris and expected to answer some profound questions about the nature of human, but that goal was quashed very soon. A young physician Jean Marc Gaspard Itard was optimistic about the future of Victor and initiated a five-year education plan to civilise him and teach him to speak. With a subsidy from the government, Itard recruited a local woman Madame Guerin to assist him to provide a semblance of a home for Victor, and he spent an enormous amount of time and effort working with Victor. Itard's goal to teach Victor the basics of speech could never be fully achieved, but Victor had learnt some elementary forms of communication.

**F.** Although other educators were beginning to recognise the simple truth embedded in Rousseau's philosophy, it is not enough to identify the stages of children's development alone. There must be certain education which had to be geared towards those stages. One of the early examples was the invention of kindergarten, which was a word and a movement created by a German-born educator, Friedrich Froebel in 1840. Froebel placed a high value on the importance of play in children's learning. His invention would spread around the world eventually in a variety of forms. Froebel's ideas were inspired through his cooperation with Johann Heinrich Pestalozzi. Froebel didn't introduce the notion of kindergarten until 58 years old, and he had been a teacher for four decades. The notion was a haven and a preparation for children who were about to enter the regimented educational system. The use of guided or structured play was a cornerstone of his kindergarten education because he believed that play was the most significant aspect of development at this time of life. Play served as a mechanism for a child to grow emotionally and to achieve a sense of self-worth. Meanwhile, teachers served to organise materials and a structured environment in which each child, as an individual, could achieve these goals. When Froebel died in 1852, dozens of kindergartens had been created in Germany. Kindergartens began to increase in Europe, and the movement eventually reached and flourished in the United States in the 20th century.

## TEST 9 – The “Extinct” Grass in Britain

Match each statement with the correct person.

<b>List of People</b> A. A. M. Barnard B. Philip Smith C. George Claridge Druce D. Joan Thirsk E. Professor Hackel F. Nathaniel Fiennes	1. identified interrupted brome as another species of brome. 2. convinced others about the status of interrupted brome in the botanic world. 3. said that sainfoin was first found more than 300 years ago. 4. helped farmers know that sainfoin is useful for enriching the soil. 5. collected the first sample of interrupted brome.
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**A.** The British grass interrupted brome was said to be extinct, just like the Dodo. Called interrupted brome because of its gappy seed-head, this unprepossessing grass was found nowhere else in the world, Gardening experts from the Victorian era were first to record it. In the early 20th century, it grew far and wide across southern England. But it quickly vanished and by 1972 was nowhere to be found. Even the seeds stored at the Cambridge University Botanic Garden as an insurance policy were dead, having been mistakenly kept at room temperature. Fans of the grass were devastated.

**B.** However, reports of its decline were not entirely correct. Interrupted brome has enjoyed a revival, one that's not due to science. Because of the work of one gardening enthusiast, interrupted brome is thriving as a pot plant. The relaunching into the wild of Britain's almost extinct plant has excited conservationists everywhere.

**C.** Originally, Philip Smith didn't know that he had the very unusual grass at his own home. When he heard about the grass becoming extinct, he wanted to do something surprising. He attended a meeting of the British Botanical Society in Manchester in 1979, and seized his opportunity. He said that it was so disappointing to hear about the demise of the interrupted brome. "What a pity we didn't research it further!" he added. Then, all of a sudden he displayed his pots with so called "extinct grass" lot all to see.

**D.** Smith had kept the seeds from the last stronghold of the grass, Pamisford in 1963. It was then when the grass stalled to disappear from the wild. Smith cultivated the grass, year after year. Ultimately, it was his curiosity in the plant that saved it. not scientific or technological projects.

**E.** For now, the brome's future is guaranteed. The seeds from Smith's plants have been, securely stored in the cutting edge facilities of Millennium Seed Bank at Wakehurst Place in Sussex. And living plants thrive at the botanic gardens at Kew, Edinburgh and Cambridge. This year, seeds are also saved at sites all across the country and the grass now nourishes at several public gardens too.

**F.** The grass will now be reintroduced to the British countryside. As a part of the Species Recovery Project, the organisation English Nature will re-introduce interrupted brome into the agricultural landscape, provided willing farmers are found. Alas, the grass is neither beautiful nor practical. it is undoubtedly a weed, a weed that nobody cares for these days. The brome was probably never widespread enough to annoy farmers and today, no one would appreciate its productivity or nutritious qualities. As a grass, it leaves a lot to be desired by agriculturalists.

**G.** Smith's research has attempted to answer the question of where the grass came from. His research points to mutations from other weedy grasses as the most likely source. So close is the relationship that interrupted brome was originally deemed to be a mere variety of soil brome by the great Victorian



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taxonomist Professor Hackel. A botanist from the 19th century, Druce. Had taken notes on the grass and convinced his peers that the grass deserved its own status as a species. Despite Druce growing up in poverty and his self-taught profession, he became the leading botanist of his time.

**H.** Where the grass came from may be clear, but the timing of its birth may be tougher to find out. A clue lies in its penchant for growing as a weed in fields shared with a fodder crop, in particular nitrogen-fixing legumes such as sainfoin, lucerne or clover. According to agricultural historian Joan Thirsk, the humble sainfoin and its company were first noticed in Britain in the early 17th century. Seeds brought in from the Continent were sown in pastures to feed horses and other livestock. However, back then, only a few enthusiastic gentlemen were willing to use the new crops for their prized horses.

**I.** Not before too long though, the need to feed the parliamentary armies in Scotland, England and behind was more pressing than ever. Farmers were forced to produce more bread, cheese and beer. And by 1650 the legumes were increasingly introduced into arable rotations, to serve as green nature to boost grain yields. A bestseller of its day, Nathaniel Fiennes's *Sainfoin Improved*, published in 1671, helped to spread the word. With the advent of sainfoin, clover and lucerne, Britain's very own rogue grass had suddenly at rivet.

**J.** Although the credit for the discovery of interrupted brome goes to a Miss A. M. Barnard, who collected the first specimens at Odsey, Bedfordshire, in 1849, the grass had probably lurked undetected in the English countryside for at least a hundred years. Smith thinks the plant—the world's version of the Dodo probably evolved in the late 17th or early 18th century, once sainfoin became established. Due mainly to the development of the motor car and subsequent decline of fodder crops for horses, the brome declined rapidly over the 20<sup>th</sup> century. Today, sainfoin has almost disappeared from the countryside, though occasionally its colourful flowers are spotted in lowland nature reserves. More recently artificial fertilizers have made legume rotations unnecessary.

**K.** The close relationship with out-of-fashion crops spells trouble for those seeking to re-establish interrupted brome in today's countryside. Much like the once common arable weeds, such as the corncockle, its seeds cannot survive long in the soil. Each spring, the brome relied on farmers to resow its seeds; in the days before weed killers and advanced seed sieves, an ample supply would have contaminated supplies of crop seed. However fragile seeds are not the brome's only problem: this species is also unwilling to release its seeds as they ripen. According to Smith, the grass will struggle to survive even in optimal conditions. It would be very difficult to thrive amongst its more resilient competitors found in today's improved agricultural landscape.

**L.** Nonetheless, interrupted brome's reluctance to thrive independently may have some benefits. Any farmer willing to foster this unique contribution to the world's flora can rest assured that the grass will never become an invasive pest. Restoring interrupted brome to its rightful home could bring other benefits too, particularly if this strange species is granted recognition as a national treasure. Thanks to British farmers, interrupted brome was given the chance to evolve in the first place. Conservationists would like to see the grass grow once again in its natural habitat and perhaps, one day, seeing the grass become a badge of honour for a new generation of environmentally conscious farmers.

## TEST 10 – Stress of Workplace

Match each statement with the correct person.

**NB** You can use any letter **more than once**.

<b>List of People</b> A. Jan Eisner B. Vanessa Stoykov C. Gal Zauberman D. Neil Plumridge	1. Work stress usually happens in the high level of a business. 2. More people involved would be beneficial for stress relief. 3. Temporary holiday sometimes doesn't mean less work. 4. Stress leads to a wrong direction when trying to satisfy customers. 5. It is commonly accepted that stress at present is more severe than in the future.
-------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**A.** How busy is too busy? For some it means having to miss the occasional long lunch; for others it means missing lunch altogether. For a few, it is not being able to take a “sickie” once a month. Then there is a group of people for whom working every evening and weekend is normal, and franticness is the tempo of their lives. For most senior executives, workloads swing between extremely busy and frenzied. The vice-president of the management consultancy AT Kearney and its head of telecommunications for the Asia-Pacific region, Neil Plumridge, says his work weeks vary from a “manageable” 45 hours to 80 hours, but average 60 hours.

**B.** Three warning signs alert Plumridge about his workload: sleep, scheduling and family. He knows he has too much on when he gets less than six hours of sleep for three consecutive nights; when he is constantly having to reschedule appointments; “and the third one is on the family side”, says Plumridge, the father of a three-year-old daughter, and expecting a second child in October. “If I happen to miss a birthday or anniversary, I know things are out of control.” Being “too busy” is highly subjective. But for any individual, the perception of being too busy over a prolonged period can start showing up as stress: disturbed sleep, and declining mental and physical health. National workers’ compensation figures show stress causes the most lost time of any workplace injury. Employees suffering stress are off work an average of 16.6 weeks. The effects of stress are also expensive. Comcare, the Federal Government insurer, reports that in 2003-04, claims for psychological injury accounted for 7% of claims but almost 27% of claim costs. Experts say the key to dealing with stress is not to focus on relief—a game of golf or a massage but to reassess workloads. Neil Plumridge says he makes it a priority to work out what has to change; that might mean allocating extra resources to a job, allowing more time or changing expectations. The decision may take several days. He also relies on the advice of colleagues, saying his peers coach each other with business problems. “Just a fresh pair of eyes over an issue can help,” he says.

**C.** Executive stress is not confined to big organisations. Vanessa Stoykov has been running her own advertising and public relations business for seven years, specialising in work for financial and professional services firms. Evolution Media has grown so fast that it debuted on the BRW Fast 100 list of fastest-growing small enterprises last year—just after Stoykov had her first child. Stoykov thrives on the mental stimulation of running her own business. “Like everyone, I have the occasional day when I think my head’s going to blow off,” she says. Because of the growth phase the business is in, Stoykov has to concentrate on short-term stress relief—weekends in the mountains, the occasional “mental health” day—rather than delegating more work. She says: “We’re hiring more people, but you need to train them, teach them about the culture and the clients, so it’s actually more work rather than less.”

**D.** Identify the causes: Jan Eisner, Melbourne psychologist who specialises in executive coaching, says thriving on a demanding workload is typical of senior executives and other high-potential business adrenalin periods followed by quieter patches, while others thrive under sustained pressure. “We could take

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urine and blood hormonal measures and pass a judgement of whether someone's physiologically stressed or not," she says. "But that's not going to give us an indicator of what their experience of stress is, and what the emotional and cognitive impacts of stress are going to be."

**E.** Eisner's practice is informed by a movement known as positive psychology, a school of thought that argues "positive" experiences feeling engaged, challenged, and that one is making a contribution to something meaningful do not balance out negative ones such as stress; instead, they help people increase their resilience over time. Good stress, or positive experiences of being challenged and rewarded, is thus cumulative in the same way as bad stress. Eisner says many of the senior business people she coaches are relying more on regulating bad stress through methods such as meditation and yoga. She points to research showing that meditation can alter the biochemistry of the brain and actually help people "retrain" the way their brains and bodies react to stress. "Meditation and yoga enable you to shift the way that your brain reacts, so if you get proficient at it you're in control."

**F.** Recent research, such as last year's study of public servants by the British epidemiologist Sir Michael Marmot, shows the most important predictor of stress is the level of job control a person has. This debunks the theory that stress is the prerogative of high-achieving executives with type A personalities and crazy working hours. Instead, Marmot's and other research reveals they have the best kind of job: one that combines high demands (challenging work) with high control (autonomy). "The worst jobs are those that combine high demands and low control. People with demanding jobs but little autonomy have up to four times the probability of depression and more than double the risk of heart disease," LaMontagne says. "Those two alone count for an enormous part of chronic diseases, and they represent a potentially preventable part." Overseas, particularly in Europe, such research is leading companies to redesign organisational practices to increase employees' autonomy, cutting absenteeism and lifting productivity.

**G.** The Australian vice-president of AT Kearney, Neil Plumridge says, "Often stress is caused by our setting unrealistic expectations of ourselves. I'll promise a client I'll do something tomorrow, and then [promise] another client the same thing, when I really know it's not going to happen. I've put stress on myself when I could have said to the clients: Why don't I give that to you in 48 hours? The client doesn't care." Overcommitting is something people experience as an individual problem. We explain it as the result of procrastination or Parkinson's law: that work expands to fill the time available. New research indicates that people may be hard-wired to do it.

**H.** A study in the February issue of the Journal of Experimental Psychology shows that people always believe they will be less busy in the future than now. This is a misapprehension, according to the authors of the report, Professor Gal Zauberman, of the University of North Carolina, and Professor John Lynch, of Duke University. "On average, an individual will be just as busy two weeks or a month from now as he or she is today. But that is not how it appears to be in everyday life," they wrote. "People often make commitments long in advance that they would never make if the same commitments required immediate action. That is, they discount future time investments relatively steeply." Why do we perceive a greater "surplus" of time in the future than in the present? The researchers suggest that people underestimate completion times for tasks stretching into the future, and that they are bad at imagining future competition for their time.

## SUMMARY COMPLETION

### Mini warm-up practice test – Complete the summary

#### California's Age of Megafires

*Drought, housing expansion, and oversupply of tinder make for bigger, hotter fires.*

There's a reason fire squads now battling more than a dozen blazes in southern California are having such difficulty containing the flames, despite better preparedness than ever and decades of experience fighting fires fanned by the notorious Santa Ana winds. The wildfires themselves, experts say, generally are hotter, move faster, and spread more erratically than in the past.

Megafires, also called "siege fires," are the increasingly frequent blazes that burn 500,000 acres or more 10 times the size of the average forest fire of 20 years ago. One of the current wildfires is the sixth biggest in California ever, in terms of acreage burned, according to state figures and news reports.

The short-term explanation is that the region, which usually has dry summers, has had nine inches less rainfall than normal this year. Longer term, climate change across the West is leading to hotter days on average and longer fire seasons. The trend to more superhot fires, experts say, has been driven by a century-long policy of the US Forest Service to stop wildfires as quickly as possible. The unintentional consequence was to halt the natural eradication of underbrush, now the primary fuel for megafires.

Three other factors contribute to the trend, they add. First is climate change marked by a 1-degree F rise in average yearly temperature across the West. Second is a fire season that on average is 78 days longer than in the late 1980s. Third is increased building of homes and other structures in wooded areas. "We are increasingly building our homes ... in fireprone ecosystems," says Dominik Kulakowski, adjunct professor of biology at Clark University Graduate School of Geography in Worcester, Mass. Doing that "in many of the forests of the Western US ... is like building homes on the side of an active volcano."

In California, where population growth has averaged more than 600,000 a year for at least a decade, housing has pushed into such areas. "What once was open space is now residential homes providing fuel to make fires burn with greater intensity," says Terry McHale of the California Department of Forestry firefighters union. "With so much dryness, so many communities to catch fire, so many fronts to fight, it becomes an almost incredible job."

That said, many experts give California high marks for making progress on preparedness since 2003, when the largest fires in state history scorched 750,000 acres, burned 3,640 homes, and killed 22 people. Stung then by criticism of bungling that allowed fires to spread when they might have been contained, personnel are meeting the peculiar challenges of neighborhood and canyon-hopping fires better than in recent years, observers say.

State promises to provide newer engines, planes, and helicopters have been fulfilled. Firefighters unions that then complained of dilapidated equipment, old fire engines, and insufficient blueprints for fire safety are now praising the state's commitment, noting that funding for firefighting has increased despite huge cuts in many other programs.

We are pleased that the Schwarzenegger administration has been very proactive in its support of us and come through with budgetary support of the infrastructure needs we have long sought," says Mr. McHale with the firefighters union.

Besides providing money to upgrade the fire engines that must traverse the mammoth state and wind along serpentine canyon roads, the state has invested in better command-and-control facilities as well as the strategies to run them. "In the fire sieges of earlier years, we found out that we had the willingness of mutual-aid help from other jurisdictions and states, but we were not able to communicate adequately with them," says Kim Zagaris, chief of the state's Office of Emergency Services, fire and rescue branch. After a 2004 blue-ribbon commission examined and revamped those procedures, the statewide response "has become far more professional and responsive," he says.



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Besides ordering the California National Guard on Monday to make 1,500 guardsmen available for firefighting efforts, Gov. Arnold Schwarzenegger asked the Pentagon to send all available Modular Airborne Fighting Systems to the area. The military Lockheed C-130 cargo/utility aircraft carry a pressurized 3,000-gallon tank that can eject fire retardant or water in fewer than five seconds through two tubes at the rear of the plane. This load can cover an area 1/4-mile long and 60 feet wide to create a fire barrier. Governor Schwarzenegger also directed 2,300 inmate firefighters and 170 custody staff from the California Department of Corrections and Rehabilitation to work hand in hand with state and local firefighters.

Residents and government officials alike are noting the improvements with gratitude, even amid the loss of homes, churches, businesses, and farms. Despite such losses, there is a sense that the speed, dedication, and coordination of firefighters from several states and jurisdictions are resulting in greater efficiency than in past "siege fire" situations.

"I am extraordinarily impressed by the improvements we have witnessed between the last big fire and this," says Ross Simmons, a San Diego-based lawyer who had to evacuate both his home and business on Monday, taking up residence at a Hampton Inn 30 miles south of his home in Rancho Bernardo. After fires consumed 172,000 acres there in 2003, the San Diego region turned communitywide soul-searching into improved building codes, evacuation procedures, and procurement of new technology. Mr. Simmons and neighbors began receiving automated phone calls at 3:30 a.m. Monday morning telling them to evacuate. "Notwithstanding all the damage that will be caused by this, we will not come close to the loss of life because of what we have ... put in place since then," he says.

### *Questions 1-5*

*Complete the summary below using **NO MORE THAN TWO WORDS** from the passage.*

Fighting Californian wildfires is still not an easy task because the fires the firefighters now face **1** ..... in more unpredictable manner in addition to the raging heat and faster speed than ever. Megafires, as they are called, are often **2** ..... bigger than average forest fire. The reasons for this include **3** ..... below the average and the extended **4** ..... due to climate change. And according to experts, the government policy has also contributed to this by accidentally making the underbrush the **5** ..... for megafires.



## TEST 1 - Man or Machine

*MIT's humanoid robots showcase both human creativity and contemporary pessimism.*

Humanoid robots were once the stuff of political and science fiction. Today, scientists working in Japan and the USA have been turning fiction into a physical reality.

**A.** During July 2003, the Museum of Science in Cambridge, Massachusetts exhibited what Honda calls 'the world's most advanced humanoid robot', ASIMO (the Advanced Step in Innovative Mobility). Honda's brainchild is on tour in North America and delighting audiences wherever it goes. After 17 years in the making, ASIMO stands at four feet tall, weighs around 115 pounds and bob like a child in an astronaut's suit. Though it is difficult to see ASIMO's face at a distance, on closer inspection it has a smile and two large 'eyes' that conceal cameras. The robot cannot work autonomously — its actions are 'remote controlled' by scientists through the computer in its backpack. Yet watching ASIMO perform at a show in Massachusetts it seemed uncannily human. The audience cheered as ASIMO walked forwards and backwards, side to side and up and downstairs. It can even dance to the Hawaiian Hula.

**B.** While the Japanese have made huge strides in solving some of the engineering problems of human kinetics and bipedal movements, for the past 10 years scientists at MIT's former Artificial Intelligence (AI) lab (recently renamed the Computer Science and Artificial Intelligence Laboratory, CSAIL) have been making robots that can behave like humans and interact with humans. One of MIT's robots, Kismet, is an anthropomorphic head and has two eyes (complete with eyelids), ears, a mouth, and eyebrows. It has several facial expressions, including happy, sad, frightened and disgusted. Human interlocutors are able to read some of the robot's facial expressions, and often change their behaviour towards the machine as a result - for example, playing with it when it appears 'sad'. Kismet is now in MIT's museum, but the ideas developed here continue to be explored in new robots.

**C.** Cog (short for Cognition) is another pioneering project from MIT's former AI lab. Cog has a head, eyes, two arms, hands and a torso — and its proportions were originally measured from the body of a researcher in the lab. The work on Cog has been used to test theories of embodiment and developmental robotics, particularly getting a robot to develop intelligence by responding to its environment via sensors, and to learn through these types of interactions. This approach to AI was thought up and developed by a team of students and researchers led by the head of MIT's former AI lab, Rodney Brooks (now head of CSAIL), and represented a completely new development.

**D.** This work at MIT is getting furthest down the road to creating human-like and interactive robots. Some scientists argue that ASIMO is a great engineering feat but not an intelligent machine — because it is unable to interact autonomously with unpredictabilities in its environment in meaningful ways, and learn from experience. Robots like Cog and Kismet and new robots at MIT's CSAIL and media lab, however, are beginning to do this.

**E.** These are exciting developments. Creating a machine that can walk, make gestures and learn from its environment is an amazing achievement. And watch this space: these achievements are likely rapidly to be improved upon. Humanoid robots could have a plethora of uses in society, helping to free people from everyday tasks. In Japan, for example, there is an aim to create robots that can do the tasks similar to an average human, and also act in more sophisticated situations as firefighters, astronauts or medical assistants to the elderly in the workplace and in homes — partly in order to counterbalance the effects of an ageing population.

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**F.** So in addition to these potentially creative plans there lies a certain dehumanisation. The idea that companions can be replaced with machines, for example, suggests a mechanical and degraded notion of human relationships. On one hand, these developments express human creativity — our ability to invent, experiment, and to extend our control over the world. On the other hand, the aim to create a robot like a human being is spurred on by dehumanised ideas — by the sense that human companionship can be substituted by machines; that humans lose their humanity when they interact with technology; or that we are little more than surface and ritual behaviours, that can be simulated with metal and electrical circuits.

**G.** The tension between the dehumanised and creative aspects of robots has long been explored in culture. In Karel Capek's *Rossum's Universal Robots*, a 1921 play in which the term 'robot' was first coined, although Capek's robots had human-like appearance and behaviour, the dramatist never thought these robots were human. For Capek, being human was about much more than appearing to be human. In part, it was about challenging a dehumanising system, and struggling to become recognised and given the dignity of more than a machine. A similar spirit would guide us well through twenty-first century experiments in robotics.

### *Questions 1-6*

*Complete the summary below using NO MORE THAN TWO WORDS from the passage.*

It took Honda **1** ..... years to make ASIMO, a human-looking robot that attracted broad interests from audiences. Unlike ASIMO, which has to be controlled through a computer installed in the **2** ....., MIT's scientists aimed to make a robot that can imitate human behavior and **3**..... with humans. One of such particular inventions can express its own feelings through **4** ....., Another innovative project is a robot called **5** ....., which is expected to learn from its environment to gain some **6** .....

## TEST 2 - Assessing the Risk

*How do we judge whether it is right to go ahead with a new technology? Apply the precautionary principle properly and you won't go far wrong, says Colin Tudge.*

**Section 1.** As a title for a supposedly unprejudiced debate on scientific progress, "Panic attack: interrogating our obsession with risk" did not bode well. Held last week at the Royal Institution in London, the event brought together scientists from across the world to ask why society is so obsessed with risk and to call for a "more rational" approach. "We seem to be organising society around the grandmotherly maxim of 'better safe than sorry'," exclaimed *Spiked*, the online publication that organised the event. "What are the consequences of this overbearing concern with risks?"

The debate was preceded by a survey of 40 scientists who were invited to describe how awful our lives would be if the "precautionary principle" had been allowed to prevail in the past. Their response was: no heart surgery or antibiotics, and hardly any drugs at all; no aeroplanes, bicycles or high-voltage power grids; no pasteurisation, pesticides or bio-technology; no quantum mechanics; no wheel; no "discovery" of America. In short, their message was: no risk, no gain.

They have absolutely missed the point. The precautionary principle is a subtle idea. It has various forms, but all of them generally include some notion of cost-effectiveness. Thus the point is not simply to ban things that are not known to be absolutely safe. Rather, it says: "Of course you can make no progress without risk.

But if there is no obvious gain from taking the risk, then don't take it." Clearly, all the technologies listed by the 40 well-chosen savants were innately risky at their inception, as all technologies are. But all of them would have received the green light under the precautionary principle because they all had the potential to offer tremendous benefits — the solutions to very big problems if only the snags could be overcome.

If the precautionary principle had been in place, the scientists tell us, we would not have antibiotics. But of course we would — if the version of the principle that sensible people now understand had been applied. When penicillin was discovered in the 1920s, infective bacteria were laying waste to the world. Children died from diphtheria and whooping cough, every open drain brought the threat of typhoid, and any wound could lead to septicaemia and even gangrene.

Penicillin was turned into a practical drug during the Second World War, when the many pestilences that result from war threatened to kill more people than the bombs. Of course antibiotics were a priority. Of course the risks, such as they could be perceived, were worth taking.

And so with the other items on the scientists' list: electric light bulbs, blood transfusions, CAT scans, knives, the measles vaccine — the precautionary principle would have prevented all of them, they tell us. But this is just plain wrong. If the precautionary principle had been applied properly, all these creations would have passed muster, because all offered incomparable advantages compared to the risks perceived at the time.

**Section 2.** Another issue is at stake here. Statistics are not the only concept people use when weighing up risk. Human beings, subtle and evolved creatures that we are, do not survive to threescore years and ten simply by thinking like pocket calculators. A crucial issue is consumer's choice. In deciding whether to pursue the development of a new technology, the consumer's right to choose should be considered alongside considerations of risk and benefit. Clearly, skiing is more dangerous than genetically modified tomatoes. But people who ski choose to do so; they do not have skiing thrust upon them by portentous experts of the kind who now feel they have the right to reconstruct our crops. Even with skiing, there is the matter of cost effectiveness to consider: skiing, I am told, is exhilarating. Where is the exhilaration in GM soya?

Indeed, in contrast to all the other items on *Spiked's* list, GM crops stand out as an example of a technology whose benefits are far from clear. Some of the risks can at least be defined. But in the present

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economic climate, the benefits that might accrue from them seem dubious. Promoters of GM crops believe that the future population of the world cannot be fed without them. That is untrue. The crops that really matter are wheat and rice, and there is no GM research in the pipeline that will seriously affect the yield of either. GM is used to make production cheaper and hence more profitable, which is an extremely questionable ambition.

The precautionary principle provides the world with a very important safeguard. If it had been in place in the past, it might, for example, have prevented insouciant miners from polluting major rivers with mercury. We have come to a sorry pass when scientists, who should above all be dispassionate scholars, feel they should misrepresent such a principle for the purposes of commercial and political propaganda. People at large continue to mistrust science and the high technologies it produces, partly because they doubt the wisdom of scientists. On such evidence as this, these doubts are fully justified.

### *Questions 1-7*

*Complete the summary below using **NO MORE THAN THREE WORDS** from the passage.*

When applying precautionary principle to decide whether to invent a new technology, people should also take into consideration of the **1** ....., along with the usual consideration of **2** ....., For example, though risky and dangerous enough, people still enjoy **3** ..... for the excitement it provides. On the other hand, experts believe the future population desperately needs **4** ..... in spite of their undefined risks. However, the researches conducted so far have not been directed towards increasing the yield of **5** ....., but to reduce the cost of **6** ..... and to bring more profit out of it. In the end, such selfish use of precautionary principle for business and political gain has often led people to **7**..... science for they believe scientists are not to be trusted.

## TEST 3 - The Lost City

Thanks to modern remote-sensing techniques, a ruined city in Turkey is slowly revealing itself as one of the greatest and most mysterious cities of the ancient world. Sally Palmer uncovers more.

**A.** The low granite mountain, known as Kerkenes Dag, juts from the northern edge of the Cappadocian plain in Turkey. Sprawled over the mountainside are the ruins of an enormous city, contained by crumbling defensive walls seven kilometers long. Many respected archaeologists believe these are the remains of the fabled city of Pteria, the sixth-century BC stronghold of the Medes that the Greek historian Herodotus described in his famous work *The Histories*. The short-lived city came under Median control and only fifty years later was sacked, burned and its strong stone walls destroyed.

**B.** British archaeologist Dr Geoffrey Summers has spent ten years studying the site. Excavating the ruins is a challenge because of the vast area they cover. The 7 km perimeter walls run around a site covering 271 hectares. Dr Summers quickly realised it would take far too long to excavate the site using traditional techniques alone. So he decided to use modern technology as well to map the entire site, both above and beneath the surface, to locate the most interesting areas and priorities to start digging.

**C.** In 1993, Dr Summers hired a special hand-held balloon with a remote-controlled camera attached. He walked over the entire site holding the balloon and taking photos. Then one afternoon, he rented a hot-air balloon and floated over the site, taking yet more pictures. By the end of the 1994 season, Dr Summers and his team had a jigsaw of aerial photographs of the whole site. The next stage was to use remote sensing, which would let them work out what lay below the intriguing outlines and ruined walls. "Archaeology is a discipline that lends itself very well to remote sensing because it revolves around space," says Scott Branting, an associated director of the project. He started working with Dr Summers in 1995.

**D.** The project used two main remote-sensing techniques. The first is magnetometry, which works on the principle that magnetic fields at the surface of the Earth are influenced by what is buried beneath. It measures localised variations in the direction and intensity of this magnetic field. "The Earth's magnetic field can vary from place to place, depending on what happened there in the past says Branting. "If something containing iron oxide was heavily burnt, by natural or human actions, the iron particles in it can be permanently reoriented, like a compass needle, to align with the Earth's magnetic field present at that point in time and space." The magnetometer detects differences in the orientations and intensities of these iron particles from the present-day magnetic field and uses them to produce an image of what lies below ground.

**E.** Kerkenes Dag lends itself particularly well to magnetometry because it was all burnt once in a savage fire. In places the heat was sufficient to turn sandstone to glass and to melt granite. The fire was so hot that there were strong magnetic signatures set to the Earth's magnetic field from the time - around 547 BC - resulting in extremely clear pictures. Furthermore, the city was never rebuilt. "If you have multiple layers, it can confuse pictures, because you have different walls from different periods giving signatures that all go in different directions," says Branting. "We only have one going down about 1.5 meters, so we can get a good picture of this fairly short-lived city."

**F.** The other main sub-surface mapping technique, which is still being used at the site, is resistivity. This technique measures the way electrical pulses are conducted through subsurface soil. It's done by shooting pulses into the ground through a thin metal probe. Different materials have different electrical conductivity. For example, stone and mudbrick are poor conductors, but looser, damp soil conducts very well. By walking around the site and taking about four readings per metre, it is possible to get a detailed idea



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of what is where beneath the surface. The teams then build up pictures of walls, hearths and other remains. "It helps a lot if it has rained, because the electrical pulse can get through more easily," says Branting. "Then if something is more resistant, it really shows up." This is one of the reasons that the project has a spring season, when most of the resistivity work is done. Unfortunately, testing resistivity is a lot slower than magnetometry. "If we did resistivity over the whole site it would take about 100 years," says Branting. Consequently, the team is concentrating on areas where they want to clarify pictures from the magnetometry.

**G.** Remote sensing does not reveal everything about Kerkenes Dag, but it shows the most interesting sub-surface areas of the site. The archaeologists can then excavate these using traditional techniques. One surprise came when they dug out one of the gates in the defensive walls. "Our observations in early seasons led us to assume that we were looking at a stone base from a mudbrick city wall, such as would be found at most other cities in the Ancient Near East," says Dr Summers. "When we started to excavate we were staggered to discover that the walls were made entirely from stone and that the gate would have stood at least ten metres high. After ten years of study, Pteria is gradually giving up its secrets."

### Questions 1-8

*Complete the summary below. Choose **NO MORE THAN THREE WORDS** from the passage for each answer.*

#### Exploring the ancient city of Pteria

Archaeologists began working ten years ago. They started by taking photographs of the site from the ground and then from a distance in a **1** ..... They focused on what lay below the surface using a magnetometer, which identifies variations in the magnetic field. These variations occur when the **2** .....in buried structures have changed direction as a result of great heat. They line up with the surrounding magnetic field just as a **3** ..... would do.

The other remote-sensing technique employed was resistivity. This uses a **4** ..... to fire electrical pulses into the earth. The principle is that building materials like **5** ..... and stone do not conduct electricity well, while **6** ..... does this much more effectively. This technique is mainly employed during the **7** ....., when conditions are more favourable. Resistivity is mainly being used to **8** ..... some images generated by the magnetometer.

## TEST 4 - The Pearl

**A.** The pearl has always had a special status in the rich and powerful all through the history. For instance, women from ancient Rome went to bed with pearls on them, so that they could remind themselves how wealthy they were after waking up. Pearls used to have more commercial value than diamonds until jewellers learnt to cut gems. In the eastern countries like Persia, ground pearl powders could be used as a medicine to cure anything including heart diseases and epilepsy.

**B.** Pearls can generally be divided into three categories: natural, cultured and imitation. When an irritant (such as a grain of sand) gets inside a certain type of oyster, mussel, or clam, the mollusc will secrete a fluid as a means of defence to coat the irritant. Gradually, layers are accumulated around the irritant until a lustrous natural pearl is formed.

**C.** A cultured pearl undergoes the same process. There is only one difference between cultured pearls and natural ones: in cultured pearls, the irritant is a head called 'mother of pearl' and is placed in the oyster through surgical implantation. This results in much larger cores in cultivated pearls than those in natural pearls. As long as there are enough layers of nacre (the secreted fluid covering the irritant) to create a gorgeous, gem-quality pearl; the size of the nucleus wouldn't make a difference to beauty or durability.

**D.** Pearls can come from both salt and freshwater sources. Typically, pearls from salt water usually have high quality, although several freshwater pearls are considered high in quality, too. In addition, freshwater pearls often have irregular shapes, with a puffed rice appearance. Nevertheless, it is the individual merits that determine the pearl's value more than the sources of pearls. Saltwater pearl oysters are usually cultivated in protected lagoons or volcanic atolls, while most freshwater cultured pearls sold today come from China. There are a number of options for producing cultured pearls: use fresh water or sea water shells, transplant the graft into the mantle or into the gonad, add a spherical bead or do it nonbeaded.

**E.** No matter which method is used to get pearls, the process usually takes several years. Mussels must reach a mature age, which may take up almost three years, and then be transplanted an irritant. When the irritant is put in place, it takes approximately another three years for a pearl to reach its full size. Sometimes, the irritant may be rejected. As a result, the pearl may be seriously deformed, or the oyster may directly die from such numerous complications as diseases. At the end of a 5- to 10-year cycle, only half of the oysters may have made it through. Among the pearls that are actually produced in the end, only about 5% of them will be high-quality enough for the jewellery makers.

**F.** Imitation pearls are of another different story. The Island of Mallorca in Spain is renowned for its imitation pearl industry. In most cases, a bead is dipped into a solution made from fish scales. But this coating is quite thin and often wears off. One way to distinguish the imitation pearls is to have a bite on it. Fake pearls glide through your teeth, while the layers of nacre on the real pearls feel gritty.

**G.** Several factors are taken into account to evaluate a pearl: size, shape, Colour, the quality of surface and luster. Generally, the three types of pearls come in such order (with the value decreasing): natural pearls, cultured pearls and imitation pearls (which basically are worthless). For jewellers, one way to tell whether a pearl is natural or cultured is to send it to a gem lab and perform an X-ray on it. High-quality natural pearls are extremely rare. Japan's Akoya pearls are one of the glossiest pearls out there, while the south sea water of Australia is a cradle to bigger pearls.

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**H.** Historically, the pearls with the highest quality around the globe are found in the Persian Gulf, particularly around Bahrain. These pearls have to be handharvested by divers with no advanced equipment. Unfortunately, when the large reserve of oil was discovered in the early 1930s, Persian Gulf's natural pearl industry came to a sudden end because the contaminated water destroyed the once pristine pearls. In the present days, India probably has the largest stock of natural pearls. However, it is quite an irony that a large part of India's stock of natural pearls are originally from Bahrain.

### Questions 1-6

Complete the summary below. Choose **NO MORE THAN TWO WORDS** from the passage for each answer.

In history, pearls have had great importance within the men of wealth and power, which were treated as gems for women in **1** ..... . Also, pearls were even used as a medicine for people in **2** ..... . There are essentially three types of pearls: natural, cultured and imitation. Most freshwater cultured pearls sold today come from China while **3** ..... Island is famous for its imitation pearl industry. Good-quality natural pearls are exceedingly unusual.

**4** ..... often manufactures some of the glitteriest pearls while **5** ..... produces larger size ones due to the favourable environment along the coastline. In the past, **6** ..... in Persian Gulf produced the world's best pearls. Nowadays, the major remaining suppliers of natural pearls belong to India.

## **TEST 5 – The Evolutionary Mystery: Crocodile Survives**

**A.** Even though crocodiles have existed for 200 million years, they're anything but primitive. As crocodiles' ancestors, crocodilia came to adapt to an aquatic lifestyle. When most of the other contemporary reptiles went extinct, crocodiles were able to make it because their bodies changed and they adapted better to the climate. They witnessed the rise and fall of the dinosaurs, which once ruled the planet, and even the 65 million years of alleged mammalian dominance didn't wipe them off. Nowadays, the crocodiles and alligators are not that different from their prehistoric ancestors, which proves that they were (and still are) incredibly adaptive.

**B.** The first crocodile-like ancestors came into existence approximately 230 million years ago, and they had many of the features which make crocodiles natural and perfect stealth hunters: streamlined body, long tail, protective armour and long jaws. They are born with four short, webbed legs, but this does not mean that their capacity to move on the ground shall ever be underestimated. When they move, they are so fast that you won't even have any chance to try making the same mistake again by getting too close, especially when they're hunting.

**C.** Like other reptiles, crocodiles are poikilothermal animals (commonly known as coldblooded, whose body temperature changes with that of the surroundings) and consequently, require exposure to sunlight regularly to raise body temperature. When it is too hot, they would rather stay in water or shade. Compared with mammals and birds, crocodiles have a slower metabolism, which makes them less vulnerable to food shortage. In the most extreme case, a crocodile can slow its metabolism down even further, to the point that it would survive without food for a whole year, enabling them to outlive mammals in relatively volatile environments.

**D.** Crocodiles have a highly efficient way to prey catching. The prey rarely realises there might be a crocodile under the water because the crocodile makes a move without any noise or great vibration when spotting its prey. It only keeps its eyes above the water level. As soon as it feels close enough to the victim, it jerks out of the water with its wide open jaws. Crocodiles are successful because they are capable of switching feeding methods. It chases after fish and snatches birds at the water surface, hides in the waterside bushes in anticipation of a gazelle, and when the chance to ambush presents itself, the crocodile dashes forward, knocks the animal out with its powerful tail and then drags the prey into the water to drown.

**E.** In many crocodylian habitats, the hot season brings drought that dries up their hunting grounds, leaving it harder for them to regulate body temperatures. This actually allowed reptiles to rule. For instance, many crocodiles can protect themselves by digging holes and covering themselves in mud, waiting for months without consuming any food or water until the rains finally return. They transform into a quiescent state called aestivation.

**F.** The majority of crocodylian is considered to go into aestivation during the dry season. In a six-year study by Kennett and Christian, the King Crocodiles, a species of Australian freshwater crocodiles, spent nearly four months a year underground without access to water resources. Doubly labelled water was applied to detect field metabolic rates and water flux, and during some years, plasma fluid samples were taken once a month to keep track of the effects of aestivation regarding the accumulation of nitrogenous wastes and electrolyte concentrations.

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G. The study discovered that the crocodiles' metabolic engines function slowly, creating waste and exhausting water and fat reserves. Waste is stored in the urine, becoming more and more concentrated. Nevertheless, the concentration of waste products in blood doesn't fluctuate much, allowing the crocodiles to carry on their normal functions. Besides, even though the crocodiles lost water reserves and body weight when underground, the losses were proportional; upon emerging, the aestivating animals had no dehydration and displayed no other harmful effects such as a slowed-down growth rate. The two researchers reckon that this capacity of crocodiles to get themselves through the harsh times and the long starvation periods is sure to be the answer to the crocodilian line's survival throughout history.

### Questions 1-6

Complete the summary below. Choose **NO MORE THAN TWO WORDS** from the passage for each answer.

In many places inhabited by crocodilians, most types of crocodiles have evolved a successful scheme to survive in the drought brought by a **1** ..... According to Kennett and Christian's six-year study of Australian freshwater crocodiles' aestivation, they found aestivating crocodiles spent around **2** ..... of the year and had no access to **3** ..... The amount of water in the body declined proportionately with **4** .....; thus there is no sign of **5** ..... and other health-damaging impact on the crocodiles even after an aestivation period. This super capacity helps crocodiles endure the tough drought without slowing their speed of **6** .....



## TEST 6 – Stress of Workplace

**A.** How busy is too busy? For some it means having to miss the occasional long lunch; for others it means missing lunch altogether. For a few, it is not being able to take a “sickie” once a month. Then there is a group of people for whom working every evening and weekend is normal, and franticness is the tempo of their lives. For most senior executives, workloads swing between extremely busy and frenzied. The vice-president of the management consultancy AT Kearney and its head of telecommunications for the Asia-Pacific region, Neil Plumridge, says his work weeks vary from a “manageable” 45 hours to 80 hours, but average 60 hours.

**B.** Three warning signs alert Plumridge about his workload: sleep, scheduling and family. He knows he has too much on when he gets less than six hours of sleep for three consecutive nights; when he is constantly having to reschedule appointments; “and the third one is on the family side”, says Plumridge, the father of a three-year-old daughter, and expecting a second child in October. “If I happen to miss a birthday or anniversary, I know things are out of control.” Being “too busy” is highly subjective. But for any individual, the perception of being too busy over a prolonged period can start showing up as stress: disturbed sleep, and declining mental and physical health. National workers’ compensation figures show stress causes the most lost time of any workplace injury. Employees suffering stress are off work an average of 16.6 weeks. The effects of stress are also expensive. Comcare, the Federal Government insurer, reports that in 2003-04, claims for psychological injury accounted for 7% of claims but almost 27% of claim costs. Experts say the key to dealing with stress is not to focus on relief—a game of golf or a massage but to reassess workloads. Neil Plumridge says he makes it a priority to work out what has to change; that might mean allocating extra resources to a job, allowing more time or changing expectations. The decision may take several days. He also relies on the advice of colleagues, saying his peers coach each other with business problems. “Just a fresh pair of eyes over an issue can help,” he says.

**C.** Executive stress is not confined to big organisations. Vanessa Stoykov has been running her own advertising and public relations business for seven years, specialising in work for financial and professional services firms. Evolution Media has grown so fast that it debuted on the BRW Fast 100 list of fastest-growing small enterprises last year—just after Stoykov had her first child. Stoykov thrives on the mental stimulation of running her own business. “Like everyone, I have the occasional day when I think my head’s going to blow off,” she says. Because of the growth phase the business is in, Stoykov has to concentrate on short-term stress relief—weekends in the mountains, the occasional “mental health” day—rather than delegating more work. She says: “We’re hiring more people, but you need to train them, teach them about the culture and the clients, so it’s actually more work rather than less.”

**D.** Identify the causes: Jan Eisner, Melbourne psychologist who specialises in executive coaching, says thriving on a demanding workload is typical of senior executives and other high-potential business adrenalin periods followed by quieter patches, while others thrive under sustained pressure. “We could take urine and blood hormonal measures and pass a judgement of whether someone’s physiologically stressed or not,” she says. “But that’s not going to give us an indicator of what their experience of stress is, and what the emotional and cognitive impacts of stress are going to be.”

**E.** Eisner’s practice is informed by a movement known as positive psychology, a school of thought that argues “positive” experiences feeling engaged, challenged, and that one is making a contribution to something meaningful do not balance out negative ones such as stress; instead, they help people increase their resilience over time. Good stress, or positive experiences of being challenged and rewarded, is thus cumulative in the same way as bad stress. Eisner says many of the senior business people she coaches are

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relying more on regulating bad stress through methods such as meditation and yoga. She points to research showing that meditation can alter the biochemistry of the brain and actually help people “retrain” the way their brains and bodies react to stress. “Meditation and yoga enable you to shift the way that your brain reacts, so if you get proficient at it you’re in control.”

**F.** Recent research, such as last year’s study of public servants by the British epidemiologist Sir Michael Marmot, shows the most important predictor of stress is the level of job control a person has. This debunks the theory that stress is the prerogative of high-achieving executives with type A personalities and crazy working hours. Instead, Marmot’s and other research reveals they have the best kind of job: one that combines high demands (challenging work) with high control (autonomy). “The worst jobs are those that combine high demands and low control. People with demanding jobs but little autonomy have up to four times the probability of depression and more than double the risk of heart disease,” LaMontagne says. “Those two alone count for an enormous part of chronic diseases, and they represent a potentially preventable part.” Overseas, particularly in Europe, such research is leading companies to redesign organisational practices to increase employees’ autonomy, cutting absenteeism and lifting productivity.

**G.** The Australian vice-president of AT Kearney, Neil Plumridge says, “Often stress is caused by our setting unrealistic expectations of ourselves. I’ll promise a client I’ll do something tomorrow, and then [promise] another client the same thing, when I really know it’s not going to happen. I’ve put stress on myself when I could have said to the clients: Why don’t I give that to you in 48 hours? The client doesn’t care.” Overcommitting is something people experience as an individual problem. We explain it as the result of procrastination or Parkinson’s law: that work expands to fill the time available. New research indicates that people may be hard-wired to do it.

**H.** A study in the February issue of the Journal of Experimental Psychology shows that people always believe they will be less busy in the future than now. This is a misapprehension, according to the authors of the report, Professor Gal Zauberman, of the University of North Carolina, and Professor John Lynch, of Duke University. “On average, an individual will be just as busy two weeks or a month from now as he or she is today. But that is not how it appears to be in everyday life,” they wrote. “People often make commitments long in advance that they would never make if the same commitments required immediate action. That is, they discount future time investments relatively steeply.” Why do we perceive a greater “surplus” of time in the future than in the present? The researchers suggest that people underestimate completion times for tasks stretching into the future, and that they are bad at imagining future competition for their time.

### Questions 1-5

*Complete the summary below. Choose **NO MORE THAN TWO WORDS AND / OR A NUMBER** from the passage for each answer.*

Statistics from National worker’s compensation indicate stress plays the most important role in 1 ..... . Staffs take about 2 ..... for absence from work caused by stress. Not just time is our main concern but great expenses generated consequently. An official insurer wrote sometime that about 3 ..... of all claims were mental issues whereas nearly 27% costs in all claims. Sports such as 4 ..... , as well as 5 ..... could be a treatment to release stress; However, specialists recommended another practical way out, analyse workloads once again.

## **TEST 7 – Eco-Resort Management Practices**

Ecotourism is often regarded as a form of nature-based tourism and has become an important alternative source of tourists. In addition to providing the traditional resort-leisure product, it has been argued that ecotourism resort management should have a particular focus on best-practice environmental management, an educational and interpretive component, and direct indirect contributions to the conservation of the natural and cultural environment (Ayala, 1996).

Conran Cove Island Resort is a large integrated ecotourism-based resort located south of Brisbane on the Gold Coast, Queensland, Australia. As the world's population becomes increasingly urbanised, the demand for tourist attractions which are environmentally friendly, serene and offer amenities of a unique nature has grown rapidly. Couran Cove Resort, which is one such tourist attractions, is located on South Stradbroke Island, occupying approximately 150 hectares of the island. South Stradbroke Island is separated from the mainland by the Broadwater, a stretch of sea's kilometres wide. More than a century ago, there was only one Stradbroke Island, and there were at least four Aboriginal tribes living and limiting on the island. Regrettably, most of the original island dwellers were eventually killed by diseases such as tuberculosis, smallpox and influenza by the end of the 19th century. The second ship wrecked on the island in 1894, and the subsequent destruction of the ship (the Cambus Wallace) because it contained dynamite, caused a large crater in the sand hills on Stradbroke Island. Eventually, the ocean broke through the weakened land form and Stradbroke became two islands. Conran Cove Island Resort is built on one of the world's few naturally occurring sand lands, which is home to a wide range of plant communities and one of the largest remaining remnants of the rare *Livistona* rainforest left on the Gold Coast. Many mangrove and rainforest areas, and Malaleuca Wetlands on South Stradbroke Island (and in Queensland), have been cleared, drained or filled for residential, industrial, agricultural or urban development in the first half of the 20th century. Farmers and graziers finally abandoned South Stradbroke Island in 1959 because the vegetation and the soil conditions there were not suitable for agricultural activities.

### **SUSTAINABLE PRACTICES OF COUKAN COVE RESORT**

Being located on an offshore island, the resort is only accessible by means of water transport. The resort provides hourly ferry service from the marina on the mainland to and from the island. Within the resort, transport modes include walking trails, bicycle tracks and the beach train. The reception area is the counter of the shop which has not changed for 8 years at least. The accommodation is an octagonal "Bure". These are large rooms that are clean but the equipment is tiled and in some cases just working. Our ceiling fan only worked on high speed for example. Beds are hard but clean. There is a television, a radio, an old air conditioner and a small fridge. These "Bures" are right on top of each other and night noises do carry, so be careful what you say and do. The only tiling is the mosquitoes, but if you forget to bring mosquito repellent they sell some oil on the island. As an ecotourism-based resort most of the planning and development of the attraction has been concentrated on the need to co-exist with the fragile natural environment of South Stradbroke Island to achieve sustainable development.

### **WATER AND ENERGY MANAGEMENT**

South Stradbroke Island has groundwater at the centre of the island, which has a maximum height of 3 metres above sea level. The water supply is recharged by rainfall and is commonly known as an unconfined freshwater aquifer. Couran Cove Island Resort obtains its water supply by tapping into this aquifer and extracting it via a bore system. Some of the problems which have threatened the island's freshwater supply include pollution, contamination and over-consumption. In order to minimise some of these problems, all laundry activities are carried out on the mainland. The resort considers washing

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machines as onerous to the island's freshwater supply, and that the detergents contain a high level of phosphates which are a major source of water pollution. The resort uses LPG-power generation rather than a diesel-powered plant for its energy supply, supplemented by wind turbine, which has reduced greenhouse emissions by 70% of diesel-equivalent generation methods. Excess heat recovered from the generator is used to heat the swimming pool. Hot water in the eco-cabins and for some of the resort's vehicles are solar-powered. Water efficient fittings are also installed in showers and toilets. However, not all the appliances used by the resort are energy efficient, such as refrigerators. Visitors who stay at the resort are encouraged to monitor their water and energy usage via the in-house television systems, and are rewarded with prizes (such as a free return trip to the resort) accordingly if their usage level is low.

### CONCLUDING REMARKS

We examined a case study of good management practice and a pro-active sustainable tourism stance of an eco-resort. In three years of operation, Couran Cove Island Resort has won 23 international and national awards, including the 2001 Australian Tourism Award in the 4-Star Accommodation category. The resort has embraced and has effectively implemented contemporary environmental management practices. It has been argued that the successful implementation of the principles of sustainability should promote long-term social, economic and environmental benefits, while ensuring and enhancing the prospects of continued viability for the tourism enterprise. Couran Cove Island Resort does not conform to the characteristics of the Resort Development Spectrum, as proposed by Pridcaux (2000). According to Pridcaux, the resort should be at least at Phase 3 of the model (the National tourism phase), which describes an integrated resort providing 3-4 star hotel type accommodation. The primary tourist market in Phase 3 of the model consists mainly of interstate visitors. However, the number of interstate and international tourists visiting the resort is small, with the principal visitor markets comprising locals and residents from nearby towns and the Gold Coast region. The carrying capacity of Couran Cove does not seem to be of any concern to the Resort management. Given that it is a private commercial ecotourist enterprise, regulating the number of visitors to the resort to minimise damage done to the natural environment on South Stradbroke Island is not a binding constraint. However, the Resort's growth will eventually be constrained by its carrying capacity, and quantity control should be incorporated in the management strategy of the resort.

### Questions 1-5

Complete the summary below. Choose **NO MORE THAN TWO WORDS** from the passage for each answer.

Being located away from the mainland, tourists can attain the resort only by **1** ..... in a regular service provided by the resort itself. Within the resort, transports include trails for walking or tracks for both **2** ..... and the beach train. The on-island equipment is old-fashioned which is barely working such as the **3** ..... overhead. There is television, radio, an old **4** ..... and a small fridge. And you can buy the repellent for **5** ..... if you forget to bring some.



## TEST 8 - Implication of False Belief Experiments

**A.** A considerable amount of research since the mid 1980s has been concerned with what has been termed children's theory of mind. This involves children's ability to understand that people can have different beliefs and representations of the world— a capacity that is shown by four years of age. Furthermore, this ability appears to be absent in children with autism. The ability to work out that another person is thinking is clearly an important aspect of both cognitive and social development. Furthermore, one important explanation for autism is that children suffering from this condition do not have a theory of mind(TOM). Consequently, the development of children's TOM has attracted considerable attention.

**B.** Wimmer and Perner devised a 'false belief task' to address this question. They used some toys to act out the following story. Maxi left some chocolate in a blue cupboard before he went out. When he was away his mother moved the chocolate to a green cupboard. Children were asked to predict where Maxi will look for his chocolate when he returns. Most children under four years gave the incorrect answer, that Maxi will look in the green cupboard. Those over four years tended to give the correct answer, that Maxi will look in the blue cupboard. The incorrect answers indicated that the younger children did not understand that Maxi's beliefs and representations no longer matched the actual state of the world, and they failed to appreciate that Maxi will act on the basis of his beliefs rather than the way that the world is actually organised.

**C.** A simpler version of the Maxi task was devised by Baron-Cohen to take account of criticisms that younger children may have been affected by the complexity and too much information of the story in the task described above. For example, the child is shown two dolls, Sally and Anne, who have a basket and a box respectively. Sally also has a marble, which she places in her basket and then leaves to take a walk. While she is out of the room, Anne takes the marble from the basket, eventually putting it in the box. Sally returns and child is then asked where Sally will look for the marble. The child passes the task if she answers that Sally will look in the basket, where she put the marble; the child fails the task if she answers that Sally will look in the box where the child knows the marble is hidden even though Sally cannot know, since she did not see it hidden there. In order to pass the task, the child must be able to understand that another's mental representation of the situation is different from their own, and the child must be able to predict behavior based on that understanding. The results of research using false-belief tasks have been fairly consistent: most normally-developing children are unable to pass the tasks until around age four.

**D.** Leslie argues that, before 18 months, children treat the world in a literal way and rarely demonstrate pretence. He also argues that it is necessary for the cognitive system to distinguish between what is pretend and what is real. If children were not able to do this, they would not be able to distinguish between imagination and reality. Leslie suggested that this pretend play becomes possible because of the presence of a de-coupler that copies primary representations to secondary representations. For example, children, when pretending a banana is a telephone, would make a secondary representation of a banana. They would manipulate this representation and they would use their stored knowledge of 'telephone' to build on this pretence.

**E.** There is also evidence that social processes play a part in the development of TOM. Meins and her colleagues have found that what they term mind mindedness in maternal speech to six-month old infants is related to both security of attachment and to TOM abilities. Mind Mindedness involves speech that discusses infants' feelings and explains their behaviour in terms of mental stages (e.g\_ 'you' re feeling hungry')



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**F.** Lewis investigated older children living in extended families in Crete and Cyprus. They found that children who socially interact with more adults who have more friends. And who have more older siblings tend to pass TOM tasks at a slightly earlier age than other children. Furthermore, because young children are more likely to talk about their thoughts and feelings with peers than with their mothers, peer interaction may provide a special impetus to the development of a TOM. A similar point has been made by Dunn, who argues that peer interaction is more likely to contain pretend play and that it is likely to be more challenging because other children, unlike adults, do not make large adaptations to the communicative needs of other children.

**G.** In addition, there has been concern that some aspects of the TOM approach underestimate children's understanding of other people. After all infants will point to objects apparently in an effort to change a person's direction of gaze and interest; they can interact quite effectively with other people; they will express their ideas in opposition to the wishes of others; and they will show empathy for the feeling of others. Schatz studied the spontaneous speech of three-year-olds and found that these children used mental terms and used them in circumstances where there was a contrast between, for example, not being sure where an object was located and finding it, or between pretending and reality. Thus the social abilities of children indicate that they are aware of the difference between mental states and external reality at ages younger than four.

**H.** A different explanation has been put forward by Harris. He proposed that children use 'simulation'. This involves putting yourself in the other person's position, and then trying to predict what the other person would do. Thus success on false belief tasks can be explained by children trying to imagine what they would do if they were a character in the stories, rather than children being able to appreciate the beliefs of other people. Such thinking about situations that do not exist involves what is termed counterfactual reasoning.

**I.** A different explanation has been put forward by Harris. He proposed that children use "simulation". This involves putting yourself in the other person's position, and then trying to predict what the other person would do. Thus, success on false belief tasks can be explained by children trying to imagine what they would do if they were a character in the stories, rather than children being able to appreciate the beliefs of other people. Such thinking about situations that do not exist involves what is termed counterfactual reasoning.

### Questions 1-6

*Complete the summary below. Choose **NO MORE THAN ONE WORD** from the passage for each answer.*

In 1980s, research studies were designed to test the subject called Theory of Mind that if children have the ability to represent the reality. First experiments were carried out on this subject on a boy. And questions had been made on where the boy can find the location of the **1** ..... But it was accused that it had excessive **2** ..... So second modified experiment was conducted involving two dolls, and most children passed the test at the age of **3** ..... Then Lewis and Dunn researched **4** ..... children in a certain place, and found children who have more interaction such as more conversation with **5** ..... have better performance in the test, and peer interaction is **6** ..... because of consisting pretending elements.

## TEST 9 – T-Rex: Hunter or Scavenger?

Jack Horner is an unlikely academic: his dyslexia is so bad that he has trouble reading a book. But he can read the imprint of life in sandstone or muddy shale across a distance of 100 years, and it is this gift that has made him curator of palaeontology at Montana State University's Museum of the Rockies, the leader of a multi-million dollar scientific project to expose a complete slice of life 68 million years ago, and a consultant to Steven Spielberg and other Hollywood figures.

His father had a sand and gravel quarry in Montana, and the young Horner was a collector of stones and bones, complete with notes about when and where he found them. "My father had owned a ranch when he was younger, in Montana," he says. "He was enough of a geologist, being a sand and gravel man, to have a pretty good notion that they were dinosaur bones. So when I was eight years old he took me back to the area that had been his ranch, to where he had seen these big old bones. I picked up one. I am pretty sure it was the upper arm bone of a duckbilled dinosaur: it probably wasn't a duckbilled dinosaur but closely related to that. I catalogued it, and took good care of it, and then later when I was in high school; excavated my first dinosaur skeleton. It obviously started earlier than eight and I literally have been driven ever since. I feel like I was born this way."

Horner spent seven years at university, but never graduated. "I have a learning disability, I would call it a learning difference - dyslexia, they call it - and I just had a terrible time with English and foreign languages and things like that. For a degree in geology or biology they required two years of a foreign language. There was no way in the world I could do that. In fact, I didn't really pass English. So I couldn't get a degree, I just wasn't capable of it. But I took all of the courses required and I wrote a thesis and I did all sorts of things. So I have the education, I just don't have the piece of paper," he says.

"We definitely know we are working on a very broad coastal plain with the streams and rivers bordered by conifers and hardwood plants, and the areas in between these rivers were probably fern-covered. There were no grasses at all: just ferns and bushes -an unusual landscape, kind of taking the south-eastern United States - Georgia, Florida - and mixing it with the moors of England and flattening it out," he says. "Triceratops is very common: they are the cows of the Cretaceous, they are everywhere. Duckbilled dinosaurs are relatively common but not as common as triceratops and T-rex, for a meat-eating dinosaur, is very common. What we would consider the predator-prey ratio seems really off the scale. What is interesting is the little dromaeosaurs, the ones we know for sure were good predators, are haven't been found."

That is why he sees T-rex not as the lion of the Cretaceous savannah but its vulture. "Look at the wildebeest that migrate in the Serengeti of Africa, a million individuals lose about 200,000 individuals in that annual migration. There is a tremendous carrion base there. And so you have hyenas, you have tremendous numbers of vultures that are scavenging, you don't have all that many animals that are good predators. If T-rex was a top predator, especially considering how big it is, you'd expect it to be extremely rare, much rarer than the little dromaeosaurs, and yet they are everywhere, they are a dime a dozen," he says. A 12-tonne T-rex is a lot of vulture, but he doesn't see the monster as clumsy. He insisted his theory and finding, dedicated to further research upon it, of course, he would like to reevaluate if there is any case that additional evidence found or explanation raised by others in the future.

He examined the leg bones of the T-rex, and compared the length of the thigh bone (upper leg), to the shin bone (lower leg). He found that the thigh bone was equal in length or slightly longer than the shin bone, and much thicker and heavier, which proves that the animal was built to be a slow walker rather than fast running. On the other hand, the fossils of fast hunting dinosaurs always showed that the shin bone was longer than the thigh bone. This same truth can be observed in many animals of today which are designed to run fast: the ostrich, cheetah, etc.

## Welcome to Mr Aslanov's Lessons QUESTION-TYPE BASED TESTS

He also studied the fossil teeth of the T-rex, and compared them with the teeth of the Velociraptor, and put the nail in the coffin of the "hunter T-rex theory". The Velociraptor's teeth which like stake knives: sharp, razor-edged, and capable of tearing through flesh with ease. The T-rex's teeth were huge, sharp at their tip, but blunt, propelled by enormous jaw muscles, which enabled them to only crush bones.

With the evidence presented in his documentary, Horner was able to prove that the idea of the T-rex as being a hunting and ruthless killing machine is probably just a myth. In light of the scientific clues he was able to unearth, the T-rex was a slow, sluggish animal which had poor vision, an extraordinary sense of smell, that often reached its "prey" after the real hunters were done feeding, and sometimes it had to scare the hunters away from a corpse. In order to do that, the T-rex had to have been ugly, nasty-looking, and stinky. This is actually true of nearly all scavenger animals. They are usually vile and nasty looking.

### Questions 1-6

Complete the summary below. Choose **NO MORE THAN TWO WORDS** from the passage for each answer.

Jack Horner found that T-rex's **1** ..... is shorter than the thigh bone, which demonstrated that it was actually a **2** ....., unlike other swift animals such as ostrich or **3** ..... that was built to **4** ..... . Another explanation support his idea is that T-rex's teeth were rather **5** ....., which only allowed T-rex to **6** ..... hard bones instead of tearing flesh like Velociraptor.

## TEST 10 – The Bridge that swayed

When the London Millennium footbridge was opened in June 2000, it swayed alarmingly. This generated huge public interest and the bridge became known as London's "wobbly bridge." The Millennium Bridge is the first new bridge across the river Thames in London since Tower Bridge opened in 1894, and it is the first ever designed for pedestrians only. The bridge links the City of London near St Paul's Cathedral with the Tate Modern art gallery on Bankside.

The bridge opened initially on Saturday 10th June 2000. For the opening ceremony, a crowd of over 1,000 people had assembled on the south half of the bridge with a band in front. When they started to walk across with the band playing, there was immediately an unexpectedly pronounced lateral movement of the bridge deck. "It was a fine day and the bridge was on the route of a major charity walk," one of the pedestrians recounted what he saw that day.

"At first, it was still. Then it began to sway sideways, just slightly. Then, almost from one moment to the next, when large groups of people were crossing, the wobble intensified. Everyone had to stop walking to retain balance and sometimes to hold onto the hand rails for support." Immediately it was decided to limit the number of people on the bridge, and the bridge was dubbed the 'wobbly' bridge by the media who declared it another high-profile British Millennium Project failure. In order to fully investigate and resolve the issue the decision was taken to close the bridge on 12th June 2000.

Arup, the leading member of the committee in charge of the construction of the bridge, decided to tackle the issue head on. They immediately undertook a fast-track research project to seek the cause and the cure. The embarrassed engineers found the videotape that day which showed the center span swaying about 3 inches sideways every second and the south span 2 inches every 1.25 seconds. Because there was a significant wind blowing on the opening days (force 3-4) and the bridge had been decorated with large flags, the engineers first thought that winds might be exerting excessive force on the many large flags and banners, but it was rapidly concluded that wind buffeting had not contributed significantly to vibration of the bridge. But after measurements were made in university laboratories of the effects of people walking on swaying platforms and after large-scale experiments with crowds of pedestrians were conducted on the bridge itself, a new understanding and a new theory were developed.

The unexpected motion was the result of a natural human reaction to small lateral movements. It is well known that a suspension bridge has tendency to sway when troops march over it in lockstep, which is why troops are required to break step when crossing such a bridge. "If we walk on a swaying surface we tend to compensate and stabilise ourselves by spreading our legs further apart but this increases the lateral push". Pat Dallard, the engineer at Arup, says that you change the way you walk to match what the bridge is doing. It is an unconscious tendency for pedestrians to match their footsteps to the sway, thereby exacerbating it even more. "It's rather like walking on a rolling ship deck you move one way and then the other to compensate for the roll." The way people walk doesn't have to match exactly the natural frequency of the bridge as in resonance the interaction is more subtle. As the bridge moves, people adjust the way they walk in their own manner. The problem is that when there are enough people on the bridge the total sideways push can overcome the bridge's ability to absorb it. The movement becomes excessive and continues to increase until people begin to have difficulty in walking they may even have to hold on to the rails.

Professor Fujino Yozo of Tokyo University, who studied the earth-resistant Toda Bridge in Japan, believes the horizontal forces caused by walking, running or jumping could also in turn cause excessive dynamic vibration in the lateral direction in the bridge. He explains that as the structure began moving, pedestrians adjusted their gait to the same lateral rhythm as the bridge; the adjusted footsteps magnified the motion just like when four people all stand up in small boat at the same time. As more pedestrians locked into the same rhythm, the increasing oscillation led to the dramatic swaying captured on film until people stopped walking altogether, because they could not even keep upright.

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In order to design a method of reducing the movements, an immediate research program was launched by the bridge's engineering designer Arup. It was decided that the force exerted by the pedestrians had to be quantified and related to the motion of the bridge. Although there are some descriptions of this phenomenon in existing literature, none of these actually quantifies the force. So there was no quantitative analytical way to design the bridge against this effect. The efforts to solve the problem quickly got supported by a number of universities and research organisations.

The tests at the University of Southampton involved a person walking on the spot on a small shake table. The tests at Imperial College involved persons walking along a specially built, 7.2m-long platform, which could be driven laterally at different frequencies and amplitudes. These tests have their own limitations. While the Imperial College test platform was too short that only seven or eight steps could be measured at one time, the "walking on the spot" test did not accurately replicate forward walking, although many footsteps could be observed using this method. Neither test could investigate any influence of other people in a crowd on the behavior of the individual tested.

The results of the laboratory tests provided information which enabled the initial design of a retrofit to be progressed. However, unless the usage of the bridge was to be greatly restricted, only two generic options to improve its performance were considered feasible. The first was to increase the stiffness of the bridge to move all its lateral natural frequencies out of the range that could be excited by the lateral footfall forces, and the second was to increase the damping of the bridge to reduce the resonant response.

### Questions 1-6

*Complete the summary below. Choose **NO MORE THAN TWO WORDS** from the passage for each answer.*

To understand why the Millennium Bridge swayed, engineers of Arup studied the videotape taken on the day of the opening ceremony. In the beginning they thought the forces of **1** ..... might have caused the movement because there were many flags and banners on the bridge that day. But quickly new understandings arose after series of tests were conducted on how people walk on **2** ..... floors. The tests showed people would place their leg **3** ..... to keep balance when the floor is shaking. Pat Dallard even believes pedestrians may unknowingly adjust their **4** ..... to match the sway of the bridge. Professor Fujino Yozo's study found that the vibration of a bridge could be caused by the **5** ..... of people walking, running and jumping on it because the lateral rhythm of the sway could make pedestrians adjust their walk and reach the same step until it is impossible to stand **6** .....



# SHORT-ANSWER QUESTIONS

## Mini warm-up practice test – Short-answer Questions

### The 2003 Heatwave

It was the summer, scientists now realise, when global warming at last made itself unmistakably felt. We knew that summer 2003 was remarkable: Britain experienced its record high temperature and continental Europe saw forest fires raging out of control, great rivers drying to a trickle and thousands of heat-related deaths. But just how remarkable is only now becoming clear.

The three months of June, July and August were the warmest ever recorded in western and central Europe, with record national highs in Portugal, Germany and Switzerland as well as in Britain. And they were the warmest by a very long way. Over a great rectangular block of the earth stretching from west of Paris to northern Italy, taking in Switzerland and southern Germany, the average temperature for the summer months was 3.78°C above the long-term norm, said the Climatic Research Unit (CRU) of the University of East Anglia in Norwich, which is one of the world's leading institutions for the monitoring and analysis of temperature records.

That excess might not seem a lot until you are aware of the context - but then you realise it is enormous. There is nothing like this in previous data, anywhere. It is considered so exceptional that Professor Phil Jones, the CRU's director, is prepared to say openly - in a way few scientists have done before that the 2003 extreme may be directly attributed, not to natural climate variability, but to global warming caused by human actions.

Meteorologists have hitherto contented themselves with the formula that recent high temperatures are “consistent with predictions” of climate change. For the great block of the map - that stretching between 35-50N and 0-20E - the CRU has reliable temperature records dating back to 1781. Using as a baseline the average summer temperature recorded between 1961 and 1990, departures from the temperature norm, or “anomalies”, over the area as a whole can easily be plotted. As the graph shows, such is the variability of our climate that over the past 200 years, there have been at least half a dozen anomalies, in terms of excess temperature - the peaks on the graph denoting very hot years - approaching, or even exceeding, 2°C. But there has been nothing remotely like 2003, when the anomaly is nearly four degrees.

“This is quite remarkable,” Professor Jones told The Independent. “It’s very unusual in a statistical sense. If this series had a normal statistical distribution, you wouldn’t get this number. The return period [how often it could be expected to recur] would be something like one in a thousand years. If we look at an excess above the average of nearly four degrees, then perhaps nearly three degrees of that is natural variability, because we’ve seen that in past summers. But the final degree of it is likely to be due to global warming, caused by human actions.”

The summer of 2003 has, in a sense, been one that climate scientists have long been expecting. Until now, the warming has been manifesting itself mainly in winters that have been less cold than in summers that have been much hotter. Last week, the United Nations predicted that winters were warming so quickly that winter sports would die out in Europe’s lower-level ski resorts. But sooner or later, the unprecedented hot summer was bound to come, and this year it did.

One of the most dramatic features of the summer was the hot nights, especially in the first half of August. In Paris, the temperature never dropped below 23°C (73.4°F) at all between 7 and 14 August, and the city recorded its warmest-ever night on 11-12 August, when the mercury did not drop below 25.5°C (77.9°F). Germany recorded its warmest-ever night at Weinbiet in the Rhine Valley with a lowest figure of 27.6°C (80.6°F) on 13 August, and similar record-breaking nighttime temperatures were recorded in Switzerland and Italy.

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The 15,000 excess deaths in France during August, compared with previous years, have been related to the high night-time temperatures. The number gradually increased during the first 12 days of the month, peaking at about 2,000 per day on the night of 12-13 August, then fell off dramatically after 14 August when the minimum temperatures fell by about 5°C. The elderly were most affected, with a 70 per cent increase in mortality rate in those aged 75-94.

For Britain, the year as a whole is likely to be the warmest ever recorded, but despite the high temperature record on 10 August, the summer itself – defined as the June, July and August period - still comes behind 1976 and 1995, when there were longer periods of intense heat. "At the moment, the year is on course to be the third hottest ever in the global temperature record, which goes back to 1856, behind 1998 and 2002, but when all the records for October, November and December are collated, it might move into second place/" Professor Jones said. The ten hottest years in the record have all now occurred since 1990. Professor Jones is in no doubt about the astonishing nature of European summer of 2003. "The temperatures recorded were out of all proportion to the previous record," he said.

"It was the warmest summer in the past 500 years and probably way beyond that. It was enormously exceptional." His colleagues at the University of East Anglia's Tyndall Centre for Climate Change Research are now planning a special study of it. "It was a summer that has not been experienced before, either in terms of the temperature extremes that were reached, or the range and diversity of the impacts of the extreme heat," said the centre's executive director, Professor Mike Hulme. "It will certainly have left its mark on a number of countries, as to how they think and plan for climate change in the future, much as the 2000 floods have revolutionised the way the Government is thinking about flooding in the UK. The 2003 heatwave will have similar repercussions across Europe."

### Questions 1-2

Answer the questions below using **NO MORE THAN TWO WORDS AND/OR NUMBERS** from the passage for each answer.

**Q1. What are the other two hottest years in Britain besides 2003?**

---

**Q2. What has also influenced government policies like the hot summer in 2003?**

---

## TEST 1 – Spices

**A.** Spice plants, such as coriander, cardamom or ginger, contain compounds which, when added to food, give it a distinctive flavour. Spices have been used for centuries in the preparation of both meat dishes for consumption and meat dishes for long-term storage. However, an initial analysis of traditional meat-based recipes indicated that spices are not used equally in different countries and regions, so we set about investigating global patterns of spice use.

**B.** We hypothesized initially that the benefit of spices might lie in their anti-microbial properties. Those compounds in spice plants which give them their distinctive flavours probably first evolved to fight enemies such as plant-eating insects, fungi, and bacteria. Many of the organisms which afflict spice plants attack humans too, in particular the bacteria and fungi that live on and in dead plant and animal matter. So if spices kill these organisms, or inhibit their production of toxins, spice use in food might reduce our own chances of contracting food poisoning.

**C.** The results of our investigation supported this hypothesis. In common with other researchers, we found that all spices for which we could locate appropriate information have some antibacterial effects: half inhibit more than 75% of bacteria, and four (garlic, onion, allspice and oregano) inhibit 100% of those bacteria tested. In addition, many spices are powerful fungicides.

**D.** Studies also show that when combined, spices exhibit even greater anti-bacterial properties than when each is used alone. This is interesting because the food recipes we used in our sample specify an average of four different spices. Some spices are so frequently combined that the blends have acquired special names, such as 'chilli powder' (typically a mixture of red pepper, onion, paprika, garlic, cumin and oregano) and 'oriental five spice' (pepper, cinnamon, anise, fennel and cloves). One intriguing example is the French 'quatre épices' (pepper, cloves, ginger and nutmeg) which is often used in making sausages. Sausages are a rich medium for bacterial growth, and have frequently been implicated as the source of death from the botulism toxin, so the value of the antibacterial compounds in spices used for sausage preparation is obvious.

**E.** A second hypothesis we made was that spice use would be heaviest in areas where foods spoil quickly. Studies indicate that rates of bacterial growth increase dramatically with air temperature. Meat dishes that are prepared in advance and stored at room temperatures for more than a few hours, especially in tropical climates, typically show massive increases in bacterial counts. Of course temperatures within houses, particularly in areas where food is prepared and stored, may differ from those of the outside air, but usually it is even hotter in the kitchen.

**F.** Our survey of recipes from around the world confirmed this hypothesis: we found that countries with higher than average temperatures used more spices. Indeed, in hot countries nearly every meat-based recipe calls for at least one spice, and most include many spices, whereas in cooler ones, substantial proportions of dishes are prepared without spices, or with just a few. In other words, there is a significant positive correlation between mean temperature and the average quantity of spices used in cooking.

**G.** But if the main function of spices is to make food safer to eat, how did our ancestors know which ones to use in the first place? It seems likely that people who happened to add spice plants to meat during preparation, especially in hot climates, would have been less likely to suffer from food poisoning than those who did not. Spice users may also have been able to store foods for longer before they spoiled, enabling them to tolerate longer periods of scarcity. Observation and imitation of the eating habits of these

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healthier individuals by others could spread spice use rapidly through a society. Also, families that used appropriate spices would rear a greater number of more healthy offspring, to whom spice-use traditions had been demonstrated, and who possessed appropriate taste receptors.

**H.** Another question which arises is why did people develop a taste for spicy foods? One possibility involves learned taste aversions. It is known that when people eat something that makes them ill, they tend to avoid that taste subsequently. The adaptive value of such learning is obvious. Adding a spice to a food that caused sickness might alter its taste enough to make it palatable again (i.e. it tastes like a different food), as well as kill the micro-organisms that caused the illness, thus rendering it safe for consumption. By this process, food aversions would more often be associated with un-spiced (and therefore unsafe) foods, and food likings would be associated with spicy foods, especially in places where foods spoil rapidly. Over time people would have developed a natural preference for spicy food.

**I.** Of course, spice use is not the only way to avoid food poisoning. Cooking, and completely consuming wild game immediately after slaughter reduces opportunities for the growth of micro-organisms. However, this is practical only where fresh meat is abundant year-round. In areas where fresh meat is not consistently available, preservation may be accomplished by thoroughly cooking, salting, smoking, drying, and spicing meats. Indeed, salt has been used worldwide for centuries to preserve food. We suggest that all these practices have been adopted for essentially the same reason: to minimize the effects of harmful, food-borne organisms.

### Questions 1-6

Answer the questions below using **NO MORE THAN TWO WORDS AND / OR NUMBERS** from the passage for each answer.

**Q1. According to the writers, what might the use of spices in cooking help people to avoid?**

---

**Q2. What proportion of bacteria in food do four of the spices tested destroy?**

---

**Q3. Which food often contains a spice known as 'quatre epices'?**

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**Q4. Which types of country use the fewest number of spices in cooking?**

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**Q5. What might food aversions often be associated with?**

---

**Q6. Apart from spices, which substance is used in all countries to preserve food?**

---

## TEST 2 – Tower of Strength

**A.** Of all the Stories of art influencing science, tensegrity is one of the most far-reaching. On one level, tensegrity is a system of creating architecture or sculptures involving rods in compression and wires in tension. It was invented by sculptor Kenneth Snelson at Black Mountain College, the hotbed of international modernism, in 1948. At the time, Snelson was taking part in a summer school with the engineer Buckminster Fuller, who pioneered the idea of applying geometric forms to architectural and engineering innovation.

**B.** Using an abstract sculpture as a starting point, Snelson then added tension wires to the free-floating members. Fuller encouraged him and when they met up again in 1949, Snelson had perfected a concept in which stiff rods can be supported without touching by a network of wires. Although “tensegrity” (from ‘tensional integrity’) was coined by Fuller, the idea was entirely Snelson’s, and he went on to make many more tensegrity sculptures, the most famous of which is the sixty-foot high Needle Tower (1968), now at the Hirshhorn Museum and Sculpture Garden, Washington DC.

**C.** Basic tensegrity structures can be made from three drinking straws, six paper clips, and nine rubber bands. When the structure is wired up, you can see that none of the rods actually touch; they’re held in equilibrium by the rubber bands. Even this simplest model has very interesting properties. Although drinking straws are weak, with a tendency to buckle, the tension bands hold them in such a way that the compressive force is always directed straight down the tube and buckling doesn’t happen. The first thing you notice if you make one is that it is immensely fiddly to assemble pieces keep falling apart — but once the last band is secured, you can fling the object around, squash it, and it seems indestructible. The structure isn’t symmetrical in its properties. In one direction, it squashes flat and bounces back. In the other direction, it resists the pressure. If you wanted to create versatile 3D structures out of nothing much, tensegrity would take some beating.

**D.** It is strange that architects and engineers didn’t discover the principle before 1948, since the benefits of structures held in tension over traditional building techniques had been known since the invention of the suspension bridge in 1796. And the great maverick biologist D`Arcy Thompson in *On Growth and Form* (191?) had extensively analyzed the principles of tension and compression both in nature and engineering. Kenneth Snelson believed that tensegrity was a pure art and that it would never be really useful architecturally. It took some time to prove him wrong, but in the 1980s, tensegrity architecture began to appear. The key protagonist was David Geiger and the first important structure was his Gymnastics Hall at the Korean Olympics in 1988.

**E.** Five years later, its significance in quite a different field became apparent when scientists described the tensegrity model of cell structure, and this is where the principle is now making waves. What is it that prevents living things from collapsing to a blob of jelly on the floor? Unsurprisingly, it is likely to be tensegrity. For a long time, biologists ignored the mechanical properties of cells: they were just ‘elastic bags’ full of interesting chemicals. But there has to be an architecture; tissue is tough, resilient stuff that keeps its shape.

**F.** The human body is certainly a tensegrity structure; it consists of 206 bones tensegrity rods that do not touch, held together by tendons and muscles. And the tension of living cells seems to be maintained by tensegrity structures within the cell; microfilaments play the role of the rubber bands and stiff microtubules are the rods. Donald Ingber, at the Harvard Medical School, researches how cells move and stick to each other, and he believes that tensegrity offers ‘the most unified model of cell mechanics’. It explains some basic properties of cells very well.



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**G.** If cells are placed on a microscope slide, they flatten under gravity. When cells are surrounded by other cells, proteins called integrins attach one cell to another at specific locations. These act as tensegrity wires, pulling the cells taut in all directions. When the integrin network is disrupted, the cells sag. Whether or not the cell is a tensegrity structure is still controversial, but in a series of recent papers, Ingber and his team have been gradually picking off the objections with detailed studies of cell structure. For the lay observer, pictures of a cell showing triangular structures resembling a geodesic dome are highly suggestive of tensegrity.

**H.** It has been a long road since Black Mountain College in 1948, but it all comes back to Kenneth Snelson and his sculpture. Once asked what he would save from a fire in his office, Donald Ingber replied: 'The tensegrity model made by Kenneth Snelson, a gift from the artist himself.'

### Questions 1-4

Answer the questions below using **NO MORE THAN THREE WORDS** from the passage for each answer.

**Q1. Who first used the word 'tensegrity'?**

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**Q2. Which parts of the tensegrity model prevent the straws losing their shape?**

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**Q3. Which parts of a cell hold its microtubules in place?**

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**Q4. What substances join cells to each other?**

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## TEST 3 – Ocean Acidification

*Caspar Henderson reports on some new concerns.*

A. few years ago, biologist Victoria Fabry, saw the future of the world's oceans in a jar. She was aboard a research ship in the North Pacific, carrying out experiments on a species of pteropod - small molluscs with shells up to a centimetre long, which swim in a way that resembles butterfly flight, propelled by small flaps. Something strange was happening in Fabry's jars. 'The pteropods were still swimming, but their shells were visibly dissolving,' says Fabry. She realised that the animals' respiration had increased the carbon dioxide (CO<sub>2</sub>) in the jars, which had been sealed for 48 hours, changing the water's chemistry to a point where the calcium carbonate in the pteropods' shells had started to dissolve. What Fabry had stumbled on was a hint of 'the other CO<sub>2</sub> problem'.

It has taken several decades for climate change to be recognised as a serious threat. But another result of our fossil-fuel habit - ocean acidification - has only begun to be researched in the last few years. Its impact could be momentous, says Joanie Kleypas of the National Centre for Atmospheric Research in Boulder Colorado.

CO<sub>2</sub> forms carbonic acid when it dissolves in water, and the oceans are soaking up more and more of it. Recent studies show that the seas have absorbed about a third of all the fossil-fuel carbon released into the atmosphere since the beginning of the industrial revolution in the mid eighteenth century, and they will soak up much more over the next century. Yet until quite recently many people dismissed the idea that humanity could alter the acidity of the oceans, which cover 71 % of the planet's surface to an average depth of about four kilometres. The ocean's natural buffering capacity was assumed to be capable of preventing any changes in acidity even with a massive increase in CO<sub>2</sub> levels.

And it is - but only if the increase happens slowly, over hundreds of thousands of years. Over this timescale, the release of carbonates from rocks on land and from ocean sediments can neutralise the dissolved CO<sub>2</sub>, just like dropping chalk in an acid. Levels of CO<sub>2</sub> are now rising so fast that they are overwhelming the oceans' buffering capacity.

In 2003 Ken Caldeira of the Carnegie Institution in Stanford, and Michael Wickett at the Lawrence Livermore National Laboratory, calculated that the absorption of fossil CO<sub>2</sub> could make the oceans more acidic over the next few centuries than they have been for 300 million years, with the possible exception of rare catastrophic events. The potential seriousness of the effect was underlined in 2005 by the work of James Zachos of the University of California and his colleagues, who studied one of those rare catastrophic events. They showed that the mass extinction of huge numbers of deep-sea creatures around 55 million years ago was caused by ocean acidification after the release of around 4500 giga-tonnes of carbon. It took over 100,000 years for the oceans to return to their normal state.

Around the same time as the Zachos paper, the UK's Royal Society published the first comprehensive report on ocean acidification. It makes grim reading, concluding that ocean acidification is inevitable without drastic cuts in emissions. Marine ecosystems, especially coral reefs, are likely to be affected, with fishing and tourism based around reefs losing billions of dollars each year. Yet the report also stressed that there is huge uncertainty about the effects on marine life.

The sea creatures most likely to be affected are those that make their shells or skeletons from calcium carbonate, including tiny plankton and huge corals. Their shells and skeletons do not dissolve only because the upper layers of the oceans are supersaturated with calcium carbonate. Acidification reduces carbonate ion concentrations, making it harder for organisms to build their shells or skeletons. When the water drops below the saturation point, these structures will start to dissolve. Calcium carbonate comes in two different forms, aragonite and calcite, aragonite being more soluble. So organisms with aragonite structures such as corals will be hardest hit.

So far the picture looks relentlessly gloomy, but could there actually be some positive results from adding so much CO<sub>2</sub> to the seas? One intriguing finding, says Ulf Riebesell of the Leibniz institute of Marine Sciences in Kiel Germany, concerns gases that influence climate. A few experiments suggest that in

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more acidic conditions, microbes will produce more volatile organic compounds such as di-methyl sulphide, some of which escapes to the atmosphere and causes clouds to develop. More clouds would mean cooler conditions, which could potentially slow global warming.

Calculating the effect of ocean acidification on people and economies is virtually impossible, but it could be enormous. Take the impact on tropical corals, assuming that warming and other pressures such as pollution do not decimate them first. Reefs protect the shorelines of many countries. Acidification could start eating away at reefs just when they are needed more than ever because of rising sea levels.

'No serious scientist believes the oceans will be devoid of life,' says Caldeira. 'Wherever there is light and nutrients, something will live. A likely outcome will be a radical simplification of the ecosystem. Taking this and other scientists' views into account, it seems clear that acidification will mean the loss of many species so our children will not see the amazingly beautiful things that we can. It is important to tell them to go and see the corals now before it is too late.'

Answer the questions below using **NO MORE THAN THREE WORDS AND / OR NUMBERS** from the passage for each answer.

### Questions 1-7

**Q1. What does the pteropod use to move itself through the water?**

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**Q2. Which part of the pteropods was being damaged by increased acidification?**

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**Q3. What proportion of the carbon released over the last 200 years has been taken in by the oceans?**

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**Q4. Where do carbonates enter the oceans from?**

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**Q5. How long did the oceans need to recover after the destruction of marine life by acidification 55 million years ago?**

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**Q6. Which businesses will suffer if reefs are damaged?**

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**Q7. What type of creatures make their skeleton out of aragonite?**

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## **TEST 4 - How Mobile Telephony Turned into a Health Scare**

The technology which enabled mobile phones was previously used in the kind of two-way radio which could be found in taxis and emergency vehicles. Although this was a great development, it was not really considered mobile telephony because it could not be used to dial into existing phone networks. It was known as simplex technology, operating on the same principles as a walkie-talkie, which required that a user press a button, meaning that only one person at a time could talk. Simplex meant that there was only one communication frequency in use at any one time.

The first mobile phones to connect to telephone networks were often installed in cars before the hand-held version came on the market and the revolution in mobile technology began. The first generation of mobile phones (called 1G) were large, heavy and analogue and it was not until the invention of the second generation (2G) in the 1990s that digital networks could be used the digital element enabled faster signaling. At the same time, developments in battery design and energy-saving electronics allowed the phones themselves to become smaller and therefore more truly mobile. The second generation allowed for text messaging too, and this began with the first person-to-person text message in Finland in 1993, although a machine-generated text message had been successfully sent two years earlier.

None of this would have been possible without the development of duplex technology to replace the relatively primitive simplex technology of the first phase of mobile communication. In duplex technology, there are two frequencies available simultaneously. These two frequencies can be obtained by the principle of Frequency Division Duplex (FDD). To send two signals wirelessly; it is necessary to create a paired spectrum, where one band carries the uplink (from phone to antenna) and the other carries the downlink (from antenna to phone). Time Division Duplex (TDD) can achieve the same thing, but instead of splitting the frequency, the uplink and downlink are switched very rapidly, giving the impression that one frequency is used.

For mobile telephony to work to its fullest potential, it needs to have a network through which it can relay signals. This network depends on base stations which send and receive the signals. The base stations tend to be simple constructions, or masts, on top of which are mounted the antennas, with the rapid increase in demand for mobile services. The infrastructure of antennas in the United Kingdom is now huge.

Many thousands of reports have appeared claiming that the signals relayed by these antennas are harmful to human and animal health. The claims focus on the fact that the antennas are transmitting radio waves in microwave form. In some ways, public demand is responsible for the increase in the alleged threat to health. Until quite recently, voice and text messages were transmitted using 2G technology. A 2G mast can send a low-frequency microwave signal approximately 35 kilometres. Third generation (3G) technology allows users to wirelessly download information from the internet and is extremely popular. The difference is that 3G technology uses a higher frequency to carry the signals, allowing masts to emit more radiation. This problem is intensified by the need to have masts in closer proximity to each other and to the handsets themselves. Whatever danger there was in 2G signals is greatly multiplied by the fact that the 3G masts are physically much closer to people. Government authorities have so far refused to accept that there is a danger to public health, and tests carried out by governments and telecommunications companies have been restricted to testing to see if heat is being produced from these microwaves. According to many, however the problem is not heat, but electromagnetic waves which are found near the masts.

It is believed that some people, though not all, have a condition known as electro-sensitivity or electro-hypersensitivity (EHS), meaning that the electromagnetism makes them ill in some way. The actual health threat from these pulsed microwave signals is an area which greatly needs more research. It has been claimed that the signals affect all living organisms, including plants, at a cellular level and cause symptoms in people ranging from tiredness and headaches to cancer. Of particular concern is the effect that increased electromagnetic fields may have on children and the fear is that the negative effects on their health may not manifest themselves until they have had many years of continued exposure to high levels. Tests carried out

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on animals living close to this form of radiation are particularly useful because scientists can rule out the psychological effect that humans might be exhibiting due to their fear of possible contamination. Of course, the danger of exposure exists when using a mobile phone but since we do this for limited periods, between which it is believed our bodies can recover, it is not considered as serious as the effect of living or working near a mast (sometimes mounted on the very building we occupy) which is transmitting electromagnetic waves 24 hours a day.

Answer the questions below using **NO MORE THAN THREE WORDS** from the passage for each answer.

### Questions 1-6

**Q1. What were early two-way radios unable to use?**

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**Q2. What did you have to do in order to talk on a radio using simplex technology?**

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**Q3. Where were early mobile phones generally used?**

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**Q4. What development introduced digital technology into mobile telephony?**

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**Q5. Apart from the area of electronics, in which area did developments help make phones more mobile?**

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**Q6. What type of text message was the first one ever sent?**

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## TEST 5 – Automobile's History

The start of the automobile's history went all the way back to 1769 when automobiles running on the steam engine were invented as carriers for human transport. In 1806, the first batch of cars powered by an internal combustion engine came into being, which pioneered the introduction of the widespread modern petrol-fueled internal combustion engine in 1885.

It is generally acknowledged that the first practical automobiles equipped with petrol / gasoline-powered internal combustion engines were invented almost at the same time by different German inventors who were working on their own.

Karl Benz first built the automobile in 1885 in Mannheim. Benz attained a patent for his invention on 29 January 1886, and in 1888, he started to produce automobiles in a company that later became the renowned Mercedes-Benz.

As this century began, the automobile industry marched into the transportation market for the wealthy. Drivers at that time were an adventurous bunch; they would go out regardless of the weather condition even if they weren't even protected by an enclosed body or a convertible top. Everybody in the community knew who owned what car, and cars immediately became a symbol of identity and status. Later, cars became more popular among the public since it allowed people to travel whenever and wherever they wanted. Thus, the price of automobiles in Europe and North America kept dropping, and more people from the middle class could afford them. This was especially attributed to Henry Ford who did two crucial things. First, he set the price as reasonable as possible for his cars; second, he paid his employees enough salaries so that they could afford the cars made by their very own hands.

The trend of interchangeable parts and mass production in an assembly line style had been led by America, and from 1914, this concept was significantly reinforced by Henry Ford. This large-scale, production-line manufacture of affordable automobiles was debuted. A Ford car would come off all assembled from the line every 15 minutes, an interval shorter than any of the former methods. Not only did it raise productivity, but also cut down on the requirement for manpower. Ford significantly lowered the chance of injury by carrying out complicated safety procedures in production particularly assigning workers to specific locations rather than giving them the freedom to wander around. This mixture of high wages and high efficiency was known as Fordism, which provided a valuable lesson for most major industries.

The first Jeep automobile that came out as the prototype Bantam BRC was the primary light 4-wheel-drive automobile of the U.S. Army and Allies, and during World War II and the postwar period, its sale skyrocketed. Since then, plenty of Jeep derivatives with similar military and civilian functions have been created and kept upgraded in terms of overall performance in other nations.

Through all the 1950s, engine power and automobile rates grew higher, designs evolved into a more integrated and artful form, and cars were spreading globally. In the 1960s, the landscape changed as Detroit was confronted with foreign competition. The European manufacturers, used the latest technology, and Japan came into the picture as a dedicated car-making country. General Motors, Chrysler, and Ford dabbled with radical tiny cars such as the GM A-bodies with little success. As joint ventures such as the British Motor Corporation unified the market, captive imports and badge imports swept all over the US and the UK. BMC first launched a revolutionary space-friendly Mini in 1959, which turned out to harvest large global sales.

Previously remaining under the Austin and Morris names, Mini later became an individual marque in 1969. The trend of corporate consolidation landed in Italy when niche makers such as Maserati, Ferrari, and Lancia were bought by larger enterprises. By the end of the 20th century, there had been a sharp fall in the number of automobile marques.

In the US, car performance dominated marketing, justified by the typical cases of pony cars and muscle cars. However, in the 1970s, everything changed as the American automobile industry suffered from the 1973 oil crisis, competition with Japanese and European imports, automobile emission-control

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regulations and moribund innovation. The irony in all this was that full-size sedans such as Cadillac and Lincoln scored a huge comeback between the years of economic crisis.

In terms of technology, the most mentionable developments that postwar era had seen were the widespread use of independent suspensions, broader application of fuel injection, and a growing emphasis on safety in automobile design. Mazda achieved many triumphs with its engine firstly installed in the fore-wheel, though it gained itself a reputation as a gas-guzzler.

The modern era also has witnessed a sharp elevation of fuel power in the modern engine management system with the help of the computer. Nowadays, most automobiles in use are powered by an internal combustion engine, fueled by gasoline or diesel. Toxic gas from both fuels is known to pollute the air and is responsible for climate change as well as global warming.

Answer the questions below using **NO MORE THAN THREE WORDS AND / OR NUMBERS** from the passage for each answer.

### Questions 1-7

**Q1. What is the important feature owned by the modern engine since the 19th century?**

---

**Q2. What did a car symbolise to the rich at the very beginning of this century?**

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**Q3. How long did Ford assembly line take to produce a car?**

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**Q4. What is the major historical event that led American cars to suffer when competing with Japanese imported cars?**

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**Q5. What do people call the Mazda car which was designed under the frontwheel engine?**

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**Q6. What has greatly increased with the computerised engine management systems in modern society?**

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**Q7. What factor is blamed for contributing to pollution, climate change and global warming?**

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## TEST 6 - The Extraordinary Watkin Tench

At the end of 18th century, life for the average British citizen was changing. The population grew as health and industrialisation took hold of the country. However, land and resources were limited. Families could not guarantee jobs for all of their children. People who were poor or destitute had little option. To make things worse, the rate of people who turned to crime to make a living increased. In Britain, the prisons were no longer large enough to hold the convicted people of this growing criminal class. Many towns and governments were at a loss as to what to do. However, another phenomenon that was happening in the 18th century was exploration of other continents. There were many ships looking for crew members who would risk a month-long voyage across a vast ocean. This job was risky and dangerous, so few would willingly choose it. However, with so many citizens without jobs or with criminal convictions, they had little choice. One such member of this new lower class of British citizens was Watkin Tench. Between 1788 and 1868, approximately 161,700 convicts were transported to the Australian colonies of New South Wales, Van Diemen's land and Western Australia. Tench was one of these unlucky convicts to sign onto a dangerous journey. When his ship set out in 1788, he signed a three years' service to the First Fleet.

Apart from his years in Australia, people knew little about his life back in Britain. It was said he was born on 6 October 1758 at Chester in the county of Cheshire in England. He came from a decent background. Tench was a son of Fisher Tench, a dancing master who ran a boarding school in the town and Margaritta Tarleton of the Liverpool Tarletons. He grew up around a finer class of British citizens, and his family helped instruct the children of the wealthy in formal dance lessons. Though we don't know for sure how Tench was educated in this small British town, we do know that he was well educated. His diaries from his travels to Australia are written in excellent English, a skill that not everyone was lucky to possess in the 18th century. Aside from this, we know little of Tench's beginnings. We don't know how he ended up convicted of a crime. But after he started his voyage, his life changed dramatically.

During the voyage, which was harsh and took many months, Tench described landscape of different places. While sailing to Australia, Tench saw landscapes that were unfamiliar and new to him. Arriving in Australia, the entire crew was uncertain of what was to come in their new life. When they arrived in Australia, they established a British colony. Governor Philip was vested with complete authority over the inhabitants of the colony. Though still a young man, Philip was enlightened for his age. From stories of other British colonies, Philip learnt that conflict with the original peoples of the land was often a source of strife and difficulties. To avoid this, Philip's personal intent was to establish harmonious relations with local Aboriginal people. But Philip's job was even more difficult considering his crew. Other colonies were established with middle-class merchants and craftsmen. His crew were convicts, who had few other skills outside of their criminal histories. Along with making peace with the Aboriginal people, Philip also had to try to reform as well as discipline the convicts of the colony.

From the beginning, Tench stood out as different from the other convicts. During his initial time in Australia, he quickly rose in his rank, and was given extra power and responsibility over the convicted crew members. However, he was also still very different from the upper-class rulers who came to rule over the crew. He showed humanity towards the convicted workers. He didn't want to treat them as common criminals, but as trained military men. Under Tench's authority, he released the convicts' chains which were used to control them during the voyage. Tench also showed mercy towards the Aboriginal people. Governor Philip often pursued violent solutions to conflicts with the Aboriginal peoples. Tench disagreed strongly with this method. At one point, he was unable to follow the order given by the Governor Philip to punish the ten Aboriginals.

When they first arrived, Tench was fearful and contemptuous towards the Aboriginals, because the two cultures did not understand each other. However, gradually he got to know them individually and became close friends with them. Tench knew that the Aboriginal people would not cause them conflict if they looked for a peaceful solution. Though there continued to be conflict and violence, Tench's efforts helped establish a more peaceful negotiation between the two groups when they settled territory and land-

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use issues. Meanwhile, many changes were made to the new colony. The Hawkesbury River was named by Governor Philip in June 1789. Many native bird species to the river were hunted by travelling colonists. The colonists were having a great impact on the land and natural resources. Though the colonists had made a lot of progress in the untamed lands of Australia, there were still limits. The convicts were notoriously ill-informed about Australian geography, as was evident in the attempt by twenty absconders to walk from Sydney to China in 1791, believing: "China might be easily reached, being not more than a hundred miles distant, and separated only by a river." In reality, miles of ocean separated the two.

Much of Australia was unexplored by the convicts. Even Tench had little understanding of what existed beyond the established lines of their colony. Slowly, but surely, the colonists expanded into the surrounding area. A few days after arrival at Botany Bay, their original location, the fleet moved to the more suitable Port Jackson where a settlement was established at Sydney Cove on 26 January 1788. This second location was strange and unfamiliar, and the fleet was on alert for any kind of suspicious behaviors. Though Tench had made friends in Botany Bay with Aboriginal peoples, he could not be sure this new land would be uninhabited. He recalled the first time he stepped into this unfamiliar ground with a boy who helped Tench navigate. In these new lands, he met an old Aboriginal.

Answer the questions below using **NO MORE THAN TWO WORDS AND / OR NUMBERS** from the passage for each answer.

### Questions 1-7

**Q1. What could be a concrete proof of Tench's good education?**

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**Q2. How many years did Tench sign the contract to the First Fleet?**

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**Q3. What was used to control convicts during the voyage?**

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**Q4. Who gave the order to punish the Aboriginals?**

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**Q5. When did the name of Hawkesbury River come into being?**

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**Q6. Where did the escaped convicts plan to go?**

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**Q7. In which place did Tench feel unaccustomed?**

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## TEST 7 - Saving the British Bitterns

**A.** Breeding bitterns became extinct in the UK by 1886 but, following recolonization early last century, numbers rose to a peak of about 70 booming (singing) males in the 1950s, falling to fewer than 20 by the 1990s. In the late 1980s it was clear that the bittern was in trouble, but there was little information on which to base recovery actions.

**B.** Bitterns have cryptic plumage and a shy nature, usually remaining hidden within the cover of reed bed vegetation. Our first challenge was to develop standard methods to monitor their numbers. The boom of the male bittern is its most distinctive feature during the breeding season, and we developed a method to count them using the sound patterns unique to each individual. This not only allows us to be much more certain of the number of booming males in the UK, but also enables us to estimate local survival of males from one year to the next

**C.** Our first direct understanding of the habitat needs of breeding bitterns came from comparisons of reed bed sites that had lost their booming birds with those that retained them. This research showed that bitterns had been retained in reed beds where the natural process of succession, or drying out, had been slowed through management. Based on this work, broad recommendations on how to manage and rehabilitate reed beds for bitterns were made, and funding was provided through the EU LIFE Fund to manage 13 sites within the core breeding range. This project, though led by the RSPB, involved many other organisations.

**D.** To refine these recommendations and provide fine-scale, quantitative habitat prescriptions on the bitterns preferred feeding habitat, we radiotracked male bitterns on the RSPB's Minsmere and Leighton Moss reserves. This showed clear preferences for feeding in the wetter reed bed margins, particularly within the reed bed next to larger open pools. The average home range sizes of the male bitterns we followed (about 20 hectares) provided a good indication of the area of reed bed needed when managing or creating habitat for this species. Female bitterns undertake all the incubation and care of the young, so it was important to understand their needs as well. Over the course of our research, we located 87 bittern nests and found that female bitterns preferred to nest in areas of continuous vegetation, well into the reed bed, but where water was still present during the driest part of the breeding season.

**E.** The success of the habitat prescriptions developed from this research has been spectacular. For instance, at Minsmere, booming bittern numbers gradually increased from one to 10 following reed bed lowering, a management technique designed to halt the drying out process. After a low point of 11 booming males in 1997, bittern numbers in Britain responded to all the habitat management work and started to increase for the first time since the 1950s.

**F.** The final phase of research involved understanding the diet, survival and dispersal of bittern chicks. To do this we fitted small radio tags to young bittern chicks in the nest, to determine their fate through to fledging and beyond. Many chicks did not survive to fledging and starvation was found to be the most likely reason for their demise. The fish prey fed to chicks was dominated by those species penetrating into the reed edge. So, an important element of recent studies (including a PhD with the University of Hull) has been the development of recommendations on habitat and water conditions to promote healthy native fish populations

**G.** Once independent, radio-tagged young bitterns were found to seek out new sites during their first winter; a proportion of these would remain on new sites to breed if the conditions were suitable. A second EU LIFE funded project aims to provide these suitable sites in new areas. A network of 19 sites developed



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through this partnership project will secure a more sustainable UK bittern population with successful breeding outside of the core area, less vulnerable to chance events and sea level rise.

**H.** By 2004, the number of booming male bitterns in the UK had increased to 55, with almost all of the increase being on those sites undertaking management based on advice derived from our research. Although science has been at the core of the bittern story, success has only been achieved through the trust, hard work and dedication of all the managers, owners and wardens of sites that have implemented, in some cases very drastic, management to secure the future of this wetland species in the UK. The constructed bunds and five major sluices now control the water level over 82 ha, with a further 50 ha coming under control in the winter of 2005/06. Reed establishment has principally used natural regeneration or planted seedlings to provide small core areas that will in time expand to create a bigger reed area. To date nearly 275,000 seedlings have been planted and reed cover is extensive. Over 3 km of new ditches have been formed, 3.7 km of existing ditch have been reprofiled and 2.2 km of old meander (former estuarine features) has been cleaned out.

**I.** Bitterns now regularly winter on the site some indication that they are staying longer into the spring. No breeding has yet occurred but a booming male was present in the spring of 2004. A range of wildfowl breed, as well as a good number of reed bed passerines including reed bunting, reed, sedge and grasshopper warblers. Numbers of wintering shoveler have increased so that the site now holds a UK important wintering population. Malltraeth Reserve now forms part of the UK network of key sites for water vole (a UK priority species) and 12 monitoring transects has been established. Otter and brown-hare occur on the site as does the rare plant. Pillwort.

Answer the questions below using **NO MORE THAN THREE WORDS AND / OR NUMBERS** from the passage for each answer.

### Questions 1-6

**Q1. When did the birth of bitten reach its peak of number?**

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**Q2. What does the author describe the bittern's character?**

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**Q3. What is the main cause for the chick bittern's death?**

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**Q4. What is the main food for chick bittern?**

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**Q5. What system does it secure the stability for bittern's population?**

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**Q6. Besides bittern and rare vegetation, what mammals does the plan benefit?**

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## TEST 8 – Classifying Societies

Although humans have established many types of societies throughout history, sociologists and anthropologists tend to classify different societies according to the degree to which different groups within a society have unequal access to advantages such as resources, prestige or power, and usually refer to four basic types of societies. From least to most socially Complex they are clans, tribes, chiefdoms and states.

**Clan.** These are small-scale societies of hunters and gatherers, generally of fewer than 100 people, who move seasonally to exploit wild (undomesticated) food resources. Most surviving hunter-gatherer groups are of this kind, such as the Hadza of Tanzania or the San of southern Africa. Clan members are generally kinsfolk, related by descent or marriage. Clans lack formal leaders, so there are no marked economic differences or disparities in status among their members. Because clans are composed of mobile groups of hunter-gatherers, their sites consist mainly of seasonally occupied camps, and other smaller and more specialised sites. Among the latter are kill or butchery sites—locations where large mammals are killed and sometimes butchered—and work sites, where tools are made or other specific activities carried out. The base camp of such a group may give evidence of rather insubstantial dwellings or temporary shelters, along with the debris of residential occupation.

**Tribe.** These are generally larger than mobile hunter-gatherer groups, but rarely number more than a few thousand, and their diet or subsistence is based largely on cultivated plants and domesticated animals. Typically, they are settled farmers, but they may be nomadic with a very different, mobile economy based on the intensive exploitation of livestock. These are generally multi-community societies, with the individual communities integrated into the larger society through kinship ties. Although some tribes have officials and even a "capital" or seat of government, such officials lack the economic base necessary for effective use of.

The typical settlement pattern for tribes is one of settled agricultural homesteads or villages. Characteristically, no one settlement dominates any of the others in the region. Instead, the archaeologist finds evidence for isolated, permanently occupied houses or for permanent villages. Such villages may be made up of a collection of free-standing houses, like those of the first farms of the Danube valley in Europe. Or they may be clusters of buildings grouped together, for example, the pueblos of the American Southwest, and the early farming village or small town of (catalhoyuk in modern Turkey).

**Chiefdom.** These operate on the principle of ranking differences in social status between people. Different lineages (a lineage is a group claiming descent from a common ancestor) are graded on a scale of prestige, and the senior lineage, and hence the society as a whole, is governed by a chief. Prestige and rank are determined by how closely related one is to the chief, and there is no true stratification into classes. The role of the chief is crucial.

Often, there is local specialisation in craft products, and surpluses of these and of foodstuffs are periodically paid as obligation to the chief. He uses these to maintain his retainers, and may use them for redistribution to his subjects. The chiefdom generally has a center of power, often with temples, residences of the chief and his retainers, and craft specialists. Chiefdoms vary greatly in size, but the range is generally between about 5000 and 20,000 persons.

**Early State.** These preserve many of the features of chiefdoms, but the ruler (perhaps a king or sometimes a queen) has explicit authority to establish laws and also to enforce them by the use of a standing army. Society no longer depends totally upon kin relationships: it is now stratified into different classes. Agricultural workers and the poorer urban dwellers form the lowest classes, with the craft specialists above, and the priests and kinsfolk of the ruler higher still. The functions of the ruler are often separated from those

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of the priest: palace is distinguished from temple. The society is viewed as a territory owned by the ruling lineage and populated by tenants who have an obligation to pay taxes. The central capital houses a bureaucratic administration of officials; one of their principal purposes is to collect revenue (often in the form of taxes and tolls) and distribute it to government, army and craft specialists. Many early states developed complex redistribution systems to support these essential services.

This rather simple social typology, set out by Elman Service and elaborated by William Sanders and Joseph Marino, can be criticised, and it should not be used unthinkingly. Never-theless, if we are seeking to talk about early societies, we must use words and hence concepts to do so. Service's categories provide a good framework to help organise our thoughts.

Answer the questions below using **NO MORE THAN TWO WORDS AND / OR NUMBERS** from the passage for each answer.

## Questions 1-6

**Q1. What are made at the clan work sites?**

---

**Q2. What is the other way of life for tribes besides settled farming?**

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**Q3. How are Catalhoyuk's housing units arranged?**

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**Q4. What does a chief give to his subjects as rewards besides crafted goods?**

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**Q5. What is the largest possible population of a chiefdom?**

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**Q6. Which group of people is at the bottom of an early state but higher than the farmers?**

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## TEST 9 – Thomas Young The Last Know-It-All

Thomas Young (1773-1829) contributed 63 articles to the Encyclopedia Britannica, including 46 biographical entries (mostly on scientists and classicists) and substantial essays on "Bridge," "Chromatics," "Egypt," "Languages" and "Tides". Was someone who could write authoritatively about so many subjects a polymath, a genius or a dilettante? In an ambitious new biography, Andrew Robinson argues that Young is a good contender for the epitaph "the last man who knew everything." Young has competition, however: The phrase, which Robinson takes for his title, also serves as the subtitle of two other recent biographies: Leonard Warren's 1998 life of paleontologist Joseph Leidy (1823-1891) and Paula Findlen's 2004 book on Athanasius Kircher (1602-1680), another polymath.

Young, of course, did more than write encyclopedia entries. He presented his first paper to the Royal Society of London at the age of 20 and was elected a Fellow a week after his 21st birthday. In the paper, Young explained the process of accommodation in the human eye —on how the eye focuses properly on objects at varying distances. Young hypothesised that this was achieved by changes in the shape of the lens. Young also theorised that light traveled in waves and he believed that, to account for the ability to see in color, there must be three receptors in the eye corresponding to the three "principal colors" to which the retina could respond: red, green, violet. All these hypotheses were subsequently proved to be correct.

Later in his life, when he was in his forties, Young was instrumental in cracking the code that unlocked the unknown script on the Rosetta Stone, a tablet that was "found" in Egypt by the Napoleonic army in 1799. The stone contains text in three alphabets: Greek, something unrecognisable and Egyptian hieroglyphs. The unrecognisable script is now known as demotic and, as Young deduced, is related directly to hieroglyphic. His initial work on this appeared in his Britannica entry on Egypt. In another entry, he coined the term Indo-European to describe the family of languages spoken throughout most of Europe and northern India. These are the landmark achievements of a man who was a child prodigy and who, unlike many remarkable children, did not disappear into oblivion as an adult.

Born in 1773 in Somerset in England, Young lived from an early age with his maternal grandfather, eventually leaving to attend boarding school. He had devoured books from the age of two, and through his own initiative he excelled at Latin, Greek, mathematics and natural philosophy. After leaving school, he was greatly encouraged by his mother's uncle, Richard Brocklesby, a physician and Fellow of the Royal Society. Following Brocklesby's lead, Young decided to pursue a career in medicine. He studied in London, following the medical circuit, and then moved on to more formal education in Edinburgh, Göttingen and Cambridge. After completing his medical training at the University of Cambridge in 1808, Young set up practice as a physician in London. He soon became a Fellow of the Royal College of Physicians and a few years later was appointed physician at St. George's Hospital.

Young's skill as a physician, however, did not equal his skill as a scholar of natural philosophy or linguistics. Earlier, in 1801, he had been appointed to a professorship of natural philosophy at the Royal Institution, where he delivered as many as 60 lectures in a year. These were published in two volumes in 1807. In 1804 Young had become secretary to the Royal Society, a post he would hold until his death. His opinions were sought on civic and national matters, such as the introduction of gas lighting to London and methods of ship construction. From 1819 he was superintendent of the Nautical Almanac and secretary to the Board of Longitude. From 1824 to 1829 he was physician to and inspector of calculations for the Palladian Insurance Company. Between 1816 and 1825 he contributed his many and various entries to the Encyclopedia Britannica, and throughout his career he authored numerous books, essays and papers. Young is a perfect subject for a biography perfect, but daunting. Few men contributed so much to so many technical fields. Robinson's aim is to introduce non-scientists to Young's work and life. He succeeds, providing clear expositions of the technical material (especially that on optics and Egyptian hieroglyphs). Some readers of this book will, like Robinson, find Young's accomplishments impressive; others will see him as some historians have as a dilettante. Yet despite the rich material presented in this book, readers will

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not end up knowing Young personally. We catch glimpses of a playful Young, doodling Greek and Latin phrases in his notes on medical lectures and translating the verses that a young lady had written on the walls of a summerhouse into Greek elegiacs. Young was introduced into elite society, attended the theatre and learned to dance and play the flute. In addition, he was an accomplished horseman. However, his personal life looks pale next to his vibrant career and studies.

Young married Eliza Maxwell in 1804, and according to Robinson, "their marriage was a happy one and she appreciated his work," Almost all we know about her is that she sustained her husband through some rancorous disputes about optics and that she worried about money when his medical career was slow to take off. Very little evidence survives about the complexities of Young's relationships with his mother and father. Robinson does not credit them, or anyone else, with shaping Young's extraordinary mind. Despite the lack of details concerning Young's relationships, however, anyone interested in what it means to be a genius should read this book.

Answer the questions below using **NO MORE THAN THREE WORDS AND / OR NUMBERS** from the passage for each answer.

### Questions 1-6

**Q1. How many life stories did Young write for the Encyclopedia Britannica?**

---

**Q2. What aspect of scientific research did Young focus on in his first academic paper?**

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**Q3. What name did Young introduce to refer to a group of languages?**

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**Q4. Who inspired Young to start his medical studies?**

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**Q5. Where did Young get a teaching position?**

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**Q6. What contribution did Young make to London?**

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## TEST 10 - Seaweed for Human Consumption

Seaweeds are algae that live in the sea or in brackish water. Scientists often call them 'benthic marine algae', which just means 'attached algae that live in the sea'. Seaweeds come in three basic colours: red, green, and brown: dulse is the red seaweed; sea lettuce is amongst the green algae; and the brown is a wrack. Red and brown algae are almost exclusively marine, whilst green algae are also common in freshwater and in terrestrial situations. Many of these algae are very ancient organisms, and although lumped together as 'algae' are not actually closely related, having representatives in four of the five kingdoms of organisms. There are about 10,500 species of seaweeds, of which 6,500 are red algae (Rhodophyta).

The trend today is to refer to marine algae used as food as 'sea-vegetables'. The main species used in Ireland at present are dulse, carrageen moss, and various kelps and wracks. Dulse also known as dillisk in a number of areas - is a red alga that is eaten on both sides of the North Atlantic. Generally only eaten in Ireland after it has been dried, it is frequently sold in small packets, most commonly in the west and north. About 16 tonnes are used in Ireland at present; the species is also eaten in Canada, Iceland, Norway, France and Scotland. About 53 tonnes of carrageen moss were gathered in Ireland in 1994.

Whilst dulse and carrageen moss are worthy sea-vegetables with a history of utilisation and a small but proven market, other species also show considerable promise. Our kelp resources are considerably under-utilised. All of the kelp species are edible but *Laminaria saccharina* is probably the most palatable as it has a somewhat sweet taste, probably due to its high levels of mannitol, and it also cooks better.

Two other brown algae with potential as food are currently under investigation by us: *Himanthalia elongata*, known in some places as thongweed, and *Alaria esculenta*, also known as dabberlocks or murlins. *Himanthalia* is eaten in France after drying or pickling ('Spaghettis demer'), and plants are sold in Ireland dried. After soaking in water it makes a surprisingly fine accompaniment to a mixed salad; it does not have the strong seaweedy taste that some dislike. With the aid of a basic research grant from Forbairt, the Irish research and development body, we are examining the growth and life cycle of populations of this species on the west coast. Plants are easy to collect but must be dried quickly and packaged well to preserve their excellent taste and mouth feel.

*Alaria* is a large, kelp-like brown alga that grows on exposed shores; In Ireland, plants grow to considerable sizes, being found up to 6m in length in some areas, but these are dwarfed by some Pacific species that may grow to 18m in length and to 2m in width. With Marine Research Measure funding, a study of the possibility of developing fast-growing hybrids of this species by crossing species from the Atlantic and Pacific is being carried out. We have growing in culture isolates of *A. esculenta* from Ireland, Scotland, France, Norway, and Atlantic Canada and other species from British Columbia and Japan. Species of this genus are ideal for cross-breeding studies as the males and females are tiny filamentous plants that are relatively easy to grow and propagate in culture under red light which stimulates reproduction in our growth rooms. Male and female reproductive structures occur on different plants so that we can put plants from one country in with those from another to see if they are sexually compatible.

To date, we have obtained interesting results with *A. praelonga*, a large species from Japan that co-operates sexually with *A. esculenta* from the Aran Islands and other Irish sites. The resulting Irish/Japanese progeny are grown initially in sample bottles agitated on a small shaker and their growth rates compared with plants that have resulted from self-crosses. Preliminary results are very encouraging, with hybrid plants showing relatively high growth rates. We hope by this method to obtain sterile hybrids that will not reproduce in the wild so that we can introduce foreign genetic material without the fear that some sort of a tyffid will be introduced that will take over the west coast of Ireland.

While studies of these two food species are very promising, we must bear in mind that the market for such sea-vegetables is very small and needs development and investment. Nutritionally, seaweatables

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are as good as any land-vegetable and are superior in their vitamin, trace element and even protein content. The increase in catholic food tastes in Europe should see greater utilization of sea-vegetables in the next 20 years.

Answer the questions below using **NO MORE THAN THREE WORDS** from the passage for each answer.

### Questions 1-4

**Q1. What does the red light in the growth rooms do?**

---

**Q2. What are initial growth rates shown to be?**

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**Q3. What does the sea-vegetable market need?**

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**Q4. What increasingly should lead to greater consumption of sea-vegetables?**

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# MATCHING INFORMATION

## Mini warm-up practice test – Match information

### Tough Sensor Can Take the Heat

**A.** A new gas sensor made from a nickel's worth of materials can endure high temperatures, corrosion, vibrations, and exposure to water, according to its inventors at Argonne National Laboratory in Illinois. The tiny sensor detects a variety of gases.

**B.** Conventional silicon sensors do not work well at temperatures above 150°F. But Argonne's new sensor, made of ceramics and metals, is not affected by high temperatures. "The materials in this sensor behave well through a wide range of temperatures," says Michael Vogt, a control systems engineer at Argonne.

**C.** Vogt and his colleagues made the sensor by film screening layers of ceramic and metal on a ceramic substrate, then firing the sensor in an industrial oven at more than 1,000°C. The Argonne researchers set out to build a sensor that would detect overheating computer components. Before an overheating component fails, and possibly ignites, epoxy in the circuit boards release a gas. The Argonne sensor can detect this vapour and cut off power to the circuit.

**D.** The device senses gases by applying a steadily increasing voltage across its electrical leads and monitoring current spikes induced as gases react on the sensor's surface. Each gas reacts at a characteristic voltage, and the size of the current spike indicates the "signature" of several representative organic solvents.

**E.** The sensor could be used to monitor hydrocarbon emissions from cars; today's typical sensors can only measure oxygen. The sensor could also monitor gases in industrial chemical processes.

### Questions 1-4

*The passage contains five paragraphs, A-E.*

*Which paragraph contains the following information?*

*Write the correct letter, A-E*

- Q1. How the device senses gases .....
- Q2. Where the new gas sensor was created .....
- Q3. Other uses of the new gas sensor .....
- Q4. How the device was designed .....

## TEST 1 - The Pearl

**A.** The pearl has always had a special status in the rich and powerful all through the history. For instance, women from ancient Rome went to bed with pearls on them, so that they could remind themselves how wealthy they were after waking up. Pearls used to have more commercial value than diamonds until jewellers learnt to cut gems. In the eastern countries like Persia, ground pearl powders could be used as a medicine to cure anything including heart diseases and epilepsy.

**B.** Pearls can generally be divided into three categories: natural, cultured and imitation. When an irritant (such as a grain of sand) gets inside a certain type of oyster, mussel, or clam, the mollusc will secrete a fluid as a means of defence to coat the irritant. Gradually, layers are accumulated around the irritant until a lustrous natural pearl is formed.

**C.** A cultured pearl undergoes the same process. There is only one difference between cultured pearls and natural ones: in cultured pearls, the irritant is a head called 'mother of pearl' and is placed in the oyster through surgical implantation. This results in much larger cores in cultivated pearls than those in natural pearls. As long as there are enough layers of nacre (the secreted fluid covering the irritant) to create a gorgeous, gem-quality pearl; the size of the nucleus wouldn't make a difference to beauty or durability.

**D.** Pearls can come from both salt and freshwater sources. Typically, pearls from salt water usually have high quality, although several freshwater pearls are considered high in quality, too. In addition, freshwater pearls often have irregular shapes, with a puffed rice appearance. Nevertheless, it is the individual merits that determine the pearl's value more than the sources of pearls. Saltwater pearl oysters are usually cultivated in protected lagoons or volcanic atolls, while most freshwater cultured pearls sold today come from China. There are a number of options for producing cultured pearls: use fresh water or sea water shells, transplant the graft into the mantle or into the gonad, add a spherical bead or do it nonbeaded.

**E.** No matter which method is used to get pearls, the process usually takes several years. Mussels must reach a mature age, which may take up almost three years, and then be transplanted an irritant. When the irritant is put in place, it takes approximately another three years for a pearl to reach its full size. Sometimes, the irritant may be rejected. As a result, the pearl may be seriously deformed, or the oyster may directly die from such numerous complications as diseases. At the end of a 5- to 10-year cycle, only half of the oysters may have made it through. Among the pearls that are actually produced in the end, only about 5% of them will be high-quality enough for the jewellery makers.

**F.** Imitation pearls are of another different story. The Island of Mallorca in Spain is renowned for its imitation pearl industry. In most cases, a bead is dipped into a solution made from fish scales. But this coating is quite thin and often wears off. One way to distinguish the imitation pearls is to have a bite on it. Fake pearls glide through your teeth, while the layers of nacre on the real pearls feel gritty.

**G.** Several factors are taken into account to evaluate a pearl: size, shape, Colour, the quality of surface and luster. Generally, the three types of pearls come in such order (with the value decreasing): natural pearls, cultured pearls and imitation pearls (which basically are worthless). For jewellers, one way to tell whether a pearl is natural or cultured is to send it to a gem lab and perform an X-ray on it. High-quality natural pearls are extremely rare. Japan's Akoya pearls are one of the glossiest pearls out there, while the south sea water of Australia is a cradle to bigger pearls.

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**H.** Historically, the pearls with the highest quality around the globe are found in the Persian Gulf, particularly around Bahrain. These pearls have to be handharvested by divers with no advanced equipment. Unfortunately, when the large reserve of oil was discovered in the early 1930s, Persian Gulf's natural pearl industry came to a sudden end because the contaminated water destroyed the once pristine pearls. In the present days, India probably has the largest stock of natural pearls. However, it is quite an irony that a large part of India's stock of natural pearls are originally from Bahrain.

## Questions 1-4

*The passage contains eight paragraphs, A-H.*

*Which paragraph contains the following information?*

*Write the correct letter, A-H.*

- Q1. Ancient stories around pearls and its customers .....
- Q2. Difficulties in cultivating process .....
- Q3. Factors which decide the value of natural pearls .....
- Q4. A growth mechanism that distinguishes cultured pearls from natural ones .....



## TEST 2 – How deserts are Formed?

**A.** A desert refers to a barren section of land, mainly in arid and semi-arid areas, where there is almost no precipitation, and the environment is hostile for any creature to inhabit. Deserts have been classified in a number of ways, generally combining total precipitation, how many days the rainfall occurs, temperature, humidity, and sometimes additional factors. In some places, deserts have clear boundaries marked by rivers, mountains or other landforms, while in other places, there are no clear-cut borders between desert and other landscape features.

**B.** In arid areas where there is not any covering of vegetation protecting the land, sand and dust storms will frequently take place. This phenomenon often occurs along the desert margins instead of within the deserts, where there are already no finer materials left. When a steady wind starts to blow, fine particles on the open ground will begin vibrating. As the wind picks up, some of the particles are lifted into the air. When they fall onto the ground, they hit other particles which will then be jerked into the air in their turn, initiating a chain reaction.

**C.** There has been a tremendous deal of publicity on how severe desertification can be, but the academic circle has never agreed on the causes of desertification. A common misunderstanding is that a shortage of precipitation causes the desertification—even the land in some barren areas will soon recover after the rain falls. In fact, more often than not, human activities are responsible for desertification. It might be true that the explosion in world population, especially in developing countries, is the primary cause of soil degradation and desertification. Since the population has become denser, the cultivation of crops has gone into progressively drier areas. It's especially possible for these regions to go through periods of severe drought, which explains why crop failures are common. The raising of most crops requires the natural vegetation cover to be removed first; when crop failures occur, extensive tracts of land are devoid of a plant cover and thus susceptible to wind and water erosion. All through the 1990s, dryland areas went through a population growth of 18.5 per cent, mostly in severely impoverished developing countries.

**D.** Livestock farming in semi-arid areas accelerates the erosion of soil and becomes one of the reasons for advancing desertification. In such areas where the vegetation is dominated by grasses, the breeding of livestock is a major economic activity. Grasses are necessary for anchoring barren topsoil in a dryland area. When a specific field is used to graze an excessive herd, it will experience a loss in vegetation coverage, and the soil will be trampled as well as be pulverised, leaving the topsoil exposed to destructive erosion elements such as winds and unexpected thunderstorms. For centuries, nomads have grazed their flocks and herds to any place where pasture can be found, and oases have offered chances for a more settled way of living. For some nomads, wherever they move to, the desert follows.

**E.** Trees are of great importance when it comes to maintaining topsoil and slowing down the wind speed. In many Asian countries, firewood is the chief fuel used for cooking and heating, which has caused uncontrolled clear-cutting of forests in dryland ecosystems. When too many trees are cut down, windstorms and dust storms tend to occur.

**F.** What's worse, even political conflicts and wars can also contribute to desertification. To escape from the invading enemies, the refugees will move altogether into some of the most vulnerable ecosystems on the planet. They bring along their cultivation traditions, which might not be the right kind of practice for their new settlement.

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**G.** In the 20th century, one of the states of America had a large section of farmland that had turned into desert. Since then, actions have been enforced so that such a phenomenon of desertification will not happen again. To avoid the reoccurring of desertification, people shall find other livelihoods which do not rely on traditional land uses, are not as demanding on local land and natural resource, but can still generate viable income. Such livelihoods include but are not limited to dryland aquaculture for the raising of fish, crustaceans and industrial compounds derived from microalgae, greenhouse agriculture, and activities that are related to tourism. Another way to prevent the reoccurring of desertification is bringing about economic prospects in the city centres of drylands and places outside drylands. Changing the general economic and institutional structures that generate new chances for people to support themselves would alleviate the current pressures accompanying the desertification processes.

**H.** In nowadays society, new technologies are serving as a method to resolve the problems brought by desertification. Satellites have been utilised to investigate the influence that people and livestock have on our planet Earth. Nevertheless, it doesn't mean that alternative technologies are not needed to help with the problems and process of desertification.

## Questions 1-7

*The passage contains eight paragraphs, A-H.*

*Which paragraph contains the following information?*

*Write the correct letter, A-H.*

**NB** You may use any letter more than once.

- Q1. A reference to the irregular movement of particles .....  
Q2. Mention of a productive land turning into a desert in the 20th century .....  
Q3. Types of deserts .....  
Q4. mention of technical methods used to tackle the problems of deserts .....  
Q5. The influence of migration on desertification .....  
Q6. lack of agreement among the scientists about the causes of desertification .....  
Q7. A description of the fatal effects of farming practice .....

## **TEST 3 – Timekeeper: Invention of Marine Chronometer**

**A.** Up to the middle of the 18th century, the navigators were still unable to exactly identify the position at sea, so they might face a great number of risks such as the shipwreck or running out of supplies before arriving at the destination. Knowing one's position on the earth requires two simple but essential coordinates, one of which is the longitude.

**B.** The longitude is a term that can be used to measure the distance that one has covered from one's home to another place around the world without the limitations of naturally occurring baseline like the equator. To determine longitude, navigators had no choice but to measure the angle with the naval sextant between Moon centre and a specific star lunar distance along with the height of both heavenly bodies. Together with the nautical almanac, Greenwich Mean Time (GMT) was determined, which could be adopted to calculate longitude because one hour in GMT means 15-degree longitude. Unfortunately, this approach laid great reliance on the weather conditions, which brought great inconvenience to the crew members. Therefore, another method was proposed, that is, the time difference between the home time and the local time served for the measurement. Theoretically, knowing the longitude position was quite simple, even for the people in the middle of the sea with no land in sight. The key element for calculating the distance travelled was to know, at the very moment, the accurate home time. But the greatest problem is: how can a sailor know the home time at sea?

**C.** The simple and again obvious answer is that one takes an accurate clock with him, which he sets to the home time before leaving. A comparison with the local time (easily identified by checking the position of the Sun) would indicate the time difference between the home time and the local time, and thus the distance from home was obtained. The truth was that nobody in the 18<sup>th</sup> century had ever managed to create a clock that could endure the violent shaking of a ship and the fluctuating temperature while still maintaining the accuracy of time for navigation.

**D.** After 1714, as an attempt to find a solution to the problem, the British government offered a tremendous amount of £20,000, which were to be managed by the magnificently named 'Board of Longitude'. If timekeeper was the answer (and there could be other proposed solutions, since the money wasn't only offered for timekeeper), then the error of the required timekeeping for achieving this goal needed to be within 2.8 seconds a day, which was considered impossible for any clock or watch at sea, even when they were in their finest conditions.

**E.** This award, worth about £2 million today, inspired the self-taught Yorkshire carpenter John Harrison to attempt a design for a practical marine clock. In the later stage of his early career, he worked alongside his younger brother James. The first big project of theirs was to build a turret clock for the stables at Brockelsby Park, which was revolutionary because it required no lubrication. Harrison designed a marine clock in 1730, and he travelled to London in seek of financial aid. He explained his ideas to Edmond Halley, the Astronomer Royal, who then introduced him to George Graham, Britain's first-class clockmaker. Graham provided him with financial aid for his early-stage work on sea clocks. It took Harrison five years to build Harrison Number One or H1. Later, he sought the improvement from alternate design and produced H4 with the giant clock appearance. Remarkable as it was, the Board of Longitude wouldn't grant him the prize for some time until it was adequately satisfied.

**F.** Harrison had a principal contestant for the tempting prize at that time, an English mathematician called John Hadley, who developed sextant. The sextant is the tool that people adopt to measure angles, such as the one between the Sun and the horizon, for a calculation of the location of ships or planes. In addition, his invention is significant since it can help determine longitude.

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**G.** Most chronometer forerunners of that particular generation were English, but that doesn't mean every achievement was made by them. One wonderful figure in the history is the Lancastrian Thomas Earnshaw, who created the ultimate form of chronometer escapement the spring detent escapement and made the final decision on format and productions system for the marine chronometer, which turns it into a genuine modern commercial product, as well as a safe and pragmatic way of navigation at sea over the next century and half.

## Questions 1-5

*The passage contains seven paragraphs, A-G.*

*Which paragraph contains the following information?*

*Write the correct letter, A-G.*

**NB** You may use any letter more than once.

- Q1. A description of Harrison's background .....
- Q2. Problems caused by poor ocean navigation .....
- Q3. The person who gave financial support to Harrison .....
- Q4. An analysis of the long-term importance of sea clock invention .....
- Q5. The practical usage of longitude .....

## **TEST 4 – The Innovation of Grocery Stores**

**A.** At the very beginning of the 20th century, the American grocery stores offered comprehensive services: the customers would ask help from the people behind the counters (called clerks) for the items they liked, and then the clerks would wrap the items up. For the purpose of saving time, customers had to ask delivery boys or go in person to send the lists of what they intended to buy to the stores in advance and then went to pay for the goods later. Generally speaking, these grocery stores sold only one brand for each item. Such early chain stores as A&P stores, although containing full services, were very time-consuming and inefficient for the purchase.

**B.** Born in Virginia, Clarence Saunders left school at the age of 14 in 1895 to work first as a clerk in a grocery store. During his working in the store, he found that it was very inefficient for people to buy things there. Without the assistance of computers at that time, shopping was performed in a quite backward way. Having noticed that this inconvenient shopping mode could lead to tremendous consumption of time and money, Saunders, with great enthusiasm and innovation, proposed an unprecedented solution let the consumers do self-service in the process of shopping—which might bring a thorough revolution to the whole industry.

**C.** In 1902, Saunders moved to Memphis to put his perspective into practice, that is, to establish a grocery wholesale cooperative. In his newly designed grocery store, he divided the store into three different areas: 'A front lobby' served as an entrance, an exit, as well as the checkouts at the front. 'A sales department' was deliberately designed to allow customers to wander around the aisle and select their needed groceries. In this way, the clerks would not do the unnecessary work but arrange more delicate aisle and shelves to display the goods and enable the customers to browse through all the items. In the gallery above the sales department, supervisors can monitor the customers without disturbing them. 'Stockroom', where large fridges were placed to maintain fresh products, is another section of his grocery store only for the staff to enter. Also, this new shopping design and layout could accommodate more customers to go shopping simultaneously and even lead to some unimaginable phenomena: impulse buying and later supermarket.

**D.** On September 6, 1916, Saunders performed the self-service revolution in the USA by opening the first Piggly Wiggly featured by the turnstile at the entrance store at 79 Jefferson Street in Memphis, Tennessee. Quite distinct from those in other grocery stores, customers in Piggly Wiggly chose the goods on the shelves and paid the items all by themselves. Inside the Piggly Wiggly, shoppers were not at the mercy of staff. They were free to roam the store, check out the products and get what they needed by their own hands. There, the items were clearly priced, and no one forced customers to buy the things they did not need. As a matter of fact, the biggest benefit that the Piggly Wiggly brought to customers was the money-saving effect. Self-service was optimistic for the improvement. 'It is good for both the consumer and retailer because it cuts costs,' noted George T. Haley, a professor at the University of New Haven and director of the Centre for International Industry Competitiveness, 'if you look at the way in which grocery stores (previous to Piggly Wiggly and Alpha Beta) were operated, what you can find is that there are a great number of workers involved, and labour is a major expense.' Fortunately, the chain stores such as Piggly Wiggly cut the fat.

**E.** Piggly Wiggly and this kind of self-service stores soared at that time. In the first year, Saunders opened nine branches in Memphis. Meanwhile, Saunders immediately applied a patent for the self-service concept and began franchising Piggly Wiggly stores. Thanks to the employment of self-service and franchising, the number of Piggly Wiggly had increased to nearly 1,300 by 1923. Piggly Wiggly sold \$100 million (worth \$1.3 billion today) in groceries, which made it the third-biggest grocery retailer in the nation. After that, this chain store experienced company listing on the New York Stock Exchange, with the stocks



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doubling from late 1922 to March 1923. Saunders contributed significantly to the perfect design and layout of grocery stores. In order to keep the flow rate smooth, Saunders even invented the turnstile to replace the common entrance mode.

F. Clarence Saunders died in 1953, leaving abundant legacies mainly symbolised by Piggly Wiggly, the pattern of which spread extensively and lasted permanently.

## Questions 1-5

*The passage contains six paragraphs, A-F.*

*Which paragraph contains the following information?*

*Write the correct letter, A-F.*

**NB** You may use any letter more than once.

- Q1. Layout of Clarence Saunders' store .....
- Q2. A reference to a reduction by chain stores in labour costs .....
- Q3. How Clarence Saunders' idea had been carried out .....
- Q4. How people used to shop before Clarence Saunders' stores opened .....
- Q5. A description of economic success brought by Clarence Saunders's stores .....

## TEST 5 – How Well Do We Concentrate?

**A.** Do you read while listening to music? Do you like to watch TV while finishing your homework? People who have these kinds of habits are called multitaskers. Multitaskers are able to complete two tasks at the same time by dividing their focus. However, Thomas Lehman, a researcher in Psychology, believes people never really do multiple things simultaneously. Maybe a person is reading while listening to music, but in reality, the brain can only focus on one task. Reading the words in a book will cause you to ignore some of the words of the music. When people think they are accomplishing two different tasks efficiently, what they are really doing is dividing their focus. While listening to music, people become less able to focus on their surroundings. For example, we all have experience of times when we talk with friends and they are not responding properly. Maybe they are listening to someone else talk, or maybe they are reading a text on their smart phone and don't hear what you are saying. Lehman called this phenomenon "email voice"

**B.** The world has been changed by computers and its spin offs like smart-phones or cellphones. Now that most individuals have a personal device, like a smartphone or a laptop, they are frequently reading, watching or listening to virtual information. This raises the occurrence of multitasking in our day to day life. Now when you work, you work with your typewriter, your cellphone, and some colleagues who may drop by at any time to speak with you. In professional meetings, when one normally focuses and listens to one another, people are more likely to have a cell phone in their lap, reading or communicating silently with more people than ever, even inventions such as the cordless phone has increased multitasking. In the old days, a traditional wall phone would ring, and then the housewife would have to stop her activities to answer it. When it rang, the housewife will sit down with her legs up. and chat, with no laundry or sweeping or answering the door. In the modern era, our technology is convenient enough to not interrupt our daily tasks.

**C.** Earl Miller, an expert at the Massachusetts Institute of Technology, studied the prefrontal cortex, which controls the brain while a person is multitasking. According to his studies, the size of this cortex varies between species, He found that for humans, the size of this part constitutes one third of the brain, while it is only 4 to 5 percent in dogs, and about 15% in monkeys. Given that this cortex is larger on a human, it allows a human to be more flexible and accurate in his or her multitasking. However, Miller wanted to look further into whether the cortex was truly processing information about two different tasks simultaneously. He designed an experiment where he presents visual stimulants to his subjects in a way that mimics multi-tasking. Miller then attached sensors to the patients' heads to pick up the electric patterns of the brain. This sensor would show if the brain particles, called neurons, were truly processing two different tasks. What he found is that the brain neurons only lit up in singular areas one at a time, and never simultaneously.

**D.** Davis Meyer, a professor of University of Michigan, studied the young adults in a similar experiment. He instructed them to simultaneously do math problems and classify simple words into different categories. For this experiment. Meyer found that when you think you are doing several jobs at the same time, you are actually switching between jobs. Even though the people tried to do the tasks at the same time, and both tasks were eventually accomplished, overall, the task took more time than if the person focused on a single task one at a time.

**E.** People sacrifice efficiency when multitasking, Gloria Mark set office workers as his subjects. He found that they were constantly multitasking. He observed that nearly every 11 minutes people at work were disrupted. He found that doing different jobs at the same time may actually save time. However, despite the fact that they are faster, it does not mean they are more efficient. And we are equally likely to self-interrupt as be interrupted by outside sources. He found that in office nearly every 12 minutes an employee would stop and with no reason at all, check a website on their computer, call someone or write an email. If they

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concentrated for more than 20 minutes, they would feel distressed. He suggested that the average person may suffer from a short concentration span. This short attention span might be natural, but others suggest that new technology may be the problem. With cellphones and computers at our sides at all times, people will never run out of distractions. The format of media, such as advertisements, music, news articles and TV shows are also shortening, so people are used to paying attention to information for a very short time

**F.** So even though focusing on one single task is the most efficient way for our brains to work, it is not practical to use this method in real life. According to human nature, people feel more comfortable and efficient in environments with a variety of tasks, Edward Hallowell said that people are losing a lot of efficiency in the workplace due to multitasking, outside distractions and selfdistractions. As it matter of fact, the changes made to the workplace do not have to be dramatic. No one is suggesting we ban e-mail or make employees focus on only one task. However, certain common workplace tasks, such as group meetings, would be more efficient if we banned cell-phones, a common distraction. A person can also apply these tips to prevent self-distraction. Instead of arriving to your office and checking all of your e-mails for new tasks, a common workplace ritual, a person could dedicate an hour to a single task first thing in the morning. Self-timing is a great way to reduce distraction and efficiently finish tasks one by one, instead of slowing ourselves down with multi-tasking.

## Questions 1-5

*The passage contains six paragraphs, A-F.*

*Which paragraph contains the following information?*

*Write the correct letter, A-F.*

- Q1. A reference to a domestic situation that does not require multitasking .....
- Q2. A possible explanation of why we always do multitask together .....
- Q3. A practical solution to multitask in work environment .....
- Q4. Relating multitasking to the size of prefrontal cortex .....
- Q5. Longer time spent doing two tasks at the same time than one at a time .....

## TEST 6 – Keep the Water Away

**A.** Last winter's floods on the rivers of central Europe were among the worst since the Middle Ages, and as winter storms return, the spectre of floods is returning too. Just weeks ago, the river Rhone in south-east France burst its banks, driving 15,000 people from their homes, and worse could be on the way. Traditionally, river engineers have gone for Plan A: get rid of the water fast, draining it off the land and down to the sea in tall-sided rivers re-engineered as high-performance drains. But however big they dug city drains, however wide and straight they made the rivers, and however high they built the banks, the floods kept coming back to taunt them, from the Mississippi to the Danube. Arid when the floods came, they seemed to be worse than ever. No wonder engineers are turning to Plan B: sap the water's destructive strength by dispersing it into fields, forgotten lakes, flood plains and aquifers.

**B.** Back in the days when rivers took a more tortuous path to the sea, flood waters lost impetus and volume while meandering across flood plains and idling through wetlands and inland deltas. But today the water tends to have an unimpeded journey to the sea. And this means that when it rains in the uplands, the water comes down all at once. Worse, whenever we close off more flood plains, the river's flow farther downstream becomes more violent and uncontrollable. Dykes are only as good as their weakest link and the water will unerringly find it. By trying to turn the complex hydrology of rivers into the simple mechanics of a water pipe, engineers have often created danger where they promised safety, and intensified the floods they meant to end. Take the Rhine, Europe's most engineered river. For two centuries, German engineers have erased its backwaters and cut it off from its flood plain.

**C.** Today, the river has lost 7 percent of its original length and runs up to a third faster. When it rains hard in the Alps, the peak flows from several tributaries coincide in the main river, where once they arrived separately. And with fourfifths of the lower Rhine's flood plain barricaded off, the waters rise ever higher. The result is more frequent flooding that does ever-greater damage to the homes, offices and roads that sit on the flood plain. Much the same has happened in the US on the mighty Mississippi, which drains the world's second largest river catchment into the Gulf of Mexico.

**D.** The European Union is trying to improve rain forecasts and more accurately model how intense rains swell rivers. That may help cities prepare, but it won't stop the floods. To do that, say hydrologists, you need a new approach to engineering not just rivers, but the whole landscape. The UK's Environment Agency which has been granted an extra £150 million a year to spend in the wake of floods in 2000 that cost the country £1 billion- puts it like this: "The focus is now on working with the forces of nature. Towering concrete walks are out, and new wetlands : are in." To help keep London's feet dry, the agency is breaking the Thames's banks upstream and reflooding 10 square kilometres of ancient flood plain at Otmoor outside Oxford. Nearer to London it has spent £100 million creating new wetlands and a relief channel across 16 kilometres of flood plain to protect the town of Maidenhead, as well as the ancient playing fields of Eton College. And near the south coast, the agency is digging out channels to reconnect old meanders on the river Cuckmere in East Sussex that were cut off by flood banks 150 years ago.

**E.** The same is taking place on a much grander scale in Austria, in one of Europe's largest river restorations to date. Engineers are regenerating flood plains along 60 kilometres of the river Drava as it exits the Alps. They are also widening the river bed and channelling it back into abandoned meanders, oxbow lakes and backwaters overhung with willows. The engineers calculate that the restored flood plain can now store up to 10 million cubic metres of flood waters and slow storm surges coming out of the Alps by more than an hour, protecting towns as far downstream as Slovenia and Croatia.

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**F.** "Rivers have to be allowed to take more space. They have to be turned from flood-chutes into flood-foilers," says Nienhuis. And the Dutch, for whom preventing floods is a matter of survival, have gone furthest. A nation built largely on drained marshes and seabed had the fright of its life in 1993 when the Rhine almost overwhelmed it. The same happened again in 1995, when a quarter of a million people were evacuated from the Netherlands. But a new breed of "soft engineers" wants our cities to become porous, and Berlin is their shining example. Since reunification, the city's massive redevelopment has been governed by tough new rules to prevent its drains becoming overloaded after heavy rains. Harald Kraft, an architect working in the city, says: "We now see rainwater as a resource to be kept rather than got rid of at great cost." A good illustration is the giant Potsdamer Platz, a huge new commercial redevelopment by Daimler Chrysler in the heart of the city.

**G.** Los Angeles has spent billions of dollars digging huge drains and concreting river beds to carry away the water from occasional intense storms. The latest plan is to spend a cool \$280 million raising the concrete walls on the Los Angeles river by another 2 metres. Yet many communities still flood regularly. Meanwhile this desert city is shipping in water from hundreds of kilometres away in northern California and from the Colorado river in Arizona to fill its taps and swimming pools, and irrigate its green spaces. It all sounds like bad planning. "In LA we receive half the water we need in rainfall, and we throw it away. Then we spend hundreds of millions to import water," says Andy Lipkis, an LA environmentalist, along with citizen groups like Friends of the Los Angeles River and Unpaved LA, want to beat the urban flood hazard and fill the taps by holding onto the city's flood water. And it's not just a pipe dream. The authorities this year launched a \$100 million scheme to road-test the porous city in one flood-hit community in Sun Valley. The plan is to catch the rain that falls on thousands of driveways, parking lots and rooftops in the valley. Trees will soak up water from parking lots. Homes and public buildings will capture roof water to irrigate gardens and parks. And road drains will empty into old gravel pits and other leaky places that should recharge the city's underground water reserves. Result: less flooding and more water for the city. Plan B says every city should be porous, every river should have room to flood naturally and every coastline should be left to build its own defences. It sounds expensive and utopian, until you realise how much we spend trying to drain cities and protect our watery margins -and how bad we are at it.

## Questions 1-6

*The passage contains seven paragraphs, A-G.*

*Which paragraph contains the following information?*

*Write the correct letter, A-G.*

- Q1. A new approach carried out in the UK .....
- Q2. The reason why twisty path and dykes failed .....
- Q3. Illustration of an alternative plan in LA which seems much unrealistic .....
- Q4. Traditional way of tackling flood .....
- Q5. Efforts made in Netherlands and Germany .....
- Q6. One project on a river that benefits three nations .....



## **TEST 7 – The Connection Between Culture and Thought**

**A.** The world's population has surpassed 7 billion and continues to grow. Across the globe, humans have many differences. These differences can be influenced by factors such as geography, climate, politics, nationality, and many more. Culture is one such aspect that can change the way people behave.

**B.** Your culture may influence your clothing, your language, and many aspects of your life. But is culture influential enough to change the way an individual thinks? It has long been believed that people from different cultures would think differently. For example, a young boy from a farm would talk about cows while a boy from New York will talk about cars. If two young children from different countries are asked about their thoughts about a painting, they would answer differently because of their cultural backgrounds.

**C.** In recent years, there has been new research that changed this long-held belief; However, this new research is not the first to explore the idea that culture can change the way we think. Earlier research has provided valuable insight to the question. One of the earliest research projects was carried out in the Soviet Union. This project was designed to find out whether culture would affect people's way of thought processing. The researchers focused on how living environment and nationality might influence how people think. The experiment led by Bessett aimed to question such awareness of cognitive psychology. Bessett conducted several versions of the experiment to test different cognitive processes.

**D.** One experiment led by Bessett and Masuku showed an animated video picturing a big fish swimming among smaller fish and other sea creatures. Subjects were asked to describe the scene. The Japanese participants tended to focus on the aquatic background, such as the plants and colour of the water, as well as the relationship between the big and small fish. American participants tended to focus on individual fishes, mainly the larger, more unique looking fish. The experiment suggested that members of Eastern cultures focus more on the overall picture, while members of Western culture focus more on the individuals.

**E.** In another experiment performed by Bessett and Choi, the subjects were presented with some very convincing evidence for a position. Both the Korean and the American showed strong support. And after they were given some evidence opposing the position, the Korean started to modify or decrease their support. However, the American began to give more support to the former argument. This project suggested that in Korean culture, support for arguments is based on context. Ideas and conclusions are changeable and flexible, so an individual may be more willing to change his or her mind. For Americans, they were less willing to change their original conclusion.

**F.** Bessett and Ara devised an experiment to test the thought processing of both oriental and occidental worlds. Test subject was given an argument "All animals with furs hibernate. Rabbit has fur. Therefore, rabbit hibernate". People from the eastern world questioned the argument as not being logical, because in their knowledge some furry animals just don't hibernate. But the American think the statement is right. They assume the logic deduction is based on a correct argument, thus the conclusion is right since the logic is right.

**G.** From these early experiments in the Soviet Union, one might conclude that our original premise that culture can impact the way we think was still correct. However, recent research criticises this view, as well as Bessett's early experiments. Though these experiments changed the original belief on thought processing, how much does it result from all factors needs further discussion. Fischer thinks Bessett's experiments provide valuable information because his research only provides qualitative descriptions, not results from controlled environment. Chang partly agrees with him, because there are some social factors that might influence the results.

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**H.** Another criticism of Bessett's experiments is that culture was studied as a subfactor of nationality. The experiments assumed that culture would be the same among all members of a nationality. For example, every American that participated in the experiments could be assumed to have the same culture. In reality, culture is much more complicated than nationality. These early experiments did not control for other factors, such as socioeconomic status, education, ethnicity, and regional differences in culture. All of these factors could have a big effect on the individual's response.

**I.** A third criticism of Bessett's experiment is that the content itself should have been more abstract, such as a puzzle or an IQ test. With objective content, such as nature and animals, people from different countries of the world might have different pre-conceived ideas about these animals. Prior knowledge based on geographic location would further complicate the results. A test that is more abstract, or more quantitative, would provide a more controlled study of how cognitive processing works for different groups of people.

**J.** The research on culture's effect on cognitive processing still goes on today, and while some criticisms exist of Bessett's early studies, the projects still provide valuable insight. It is important for future research projects to control carefully for the variables, such as culture. Something like culture is complex and difficult to define. It can also be influenced by many other variables, such as geography or education styles. When studying a variable like culture, it is critical that the researcher create a clear definition for what is and what is not considered culture.

**K.** Another important aspect of modern research is the ethical impact of the research. A researcher must consider carefully whether the results of the research will negatively impact any of the groups involved. In an increasingly globalised job economy, generalisations made about nationalities can be harmful to prospective employees. This information could also impact the way tests and university admissions standards are designed, which would potentially favor one group or create a disadvantage for another. When conducting any research about culture and nationality, researchers should consider all possible effects, positive or negative, that their conclusions may have when published for the world to see.

## Questions 1-5

*The passage contains eleven paragraphs, A-K.*

*Which paragraph contains the following information?*

*Write the correct letter, A-K.*

**NB** You may use any letter more than once.

- Q1. All people have the same reaction to a certain point of view .....
- Q2. Qualitative descriptions are valuable in exploring thought processing .....
- Q3. Different cultures will affect the description of the same scene .....
- Q4. We thought of young people as widely different at different geographical locations .....
- Q5. Eastern people are less likely to stick to their argument .....

## **TEST 8 - Monkeys and Forests**

AS AN EAST WIND blasts through a gap in the Cordillera de Tilaran, a rugged mountain range that splits northern Costa Rica in half, a female mantled howler monkey moves through the swaying trees of the forest canopy.

**A.** Ken Glander, a primatologist from Duke University, gazes into the canopy, tracking the female's movements. Holding a dart gun, he waits with infinite patience for the right moment to shoot. With great care, Glander aims and fires. Hit in the rump, the monkey wobbles. This howler belongs to a population that has lived for decades at Hacienda La Pacifica, a working cattle ranch in Guanacaste province. Other native primates -white-faced capuchin monkeys and spider monkeys - once were common in this area, too, but vanished after the Pan-American Highway was built nearby in the 1950s. Most of the surrounding land was clear-cut for pasture.

**B.** Howlers persist at La Pacifica, Glander explains, because they are leafeaters. They eat fruit, when it's available but, unlike capuchin and spider monkeys, do not depend on large areas of fruiting trees. "Howlers can survive anyplace you have half a dozen trees, because their eating habits are so flexible," he says. In forests, life is an arms race between trees and the myriad creatures that feed on leaves. Plants have evolved a variety of chemical defenses, ranging from bad-tasting tannins, which bind with plant-produced nutrients, rendering them indigestible, to deadly poisons, such as alkaloids and cyanide.

**C.** All primates, including humans, have some ability to handle plant toxins. "We can detoxify a dangerous poison known as caffeine, which is deadly to a lot of animals:" Glander says. For leaf-eaters, long-term exposure to a specific plant toxin can increase their ability to defuse the poison and absorb the leaf nutrients. The leaves that grow in regenerating forests, like those at La Pacifica, are actually more howler friendly than those produced by the undisturbed, centuries-old trees that survive farther south, in the Amazon Basin. In younger forests, trees put most of their limited energy into growing wood, leaves and fruit, so they produce much lower levels of toxin than do well-established, old-growth trees.

**D.** The value of maturing forests to primates is a subject of study at Santa Rosa National Park, about 35 miles northwest of Hacienda La Pacifica. The park hosts populations not only of mantled howlers but also of white-faced capuchins and spider monkeys. Yet the forests there are young, most of them less than 50 years old. Capuchins were the first to begin using the reborn forests, when the trees were as young as 14 years. Howlers, larger and heavier than capuchins, need somewhat older trees, with limbs that can support their greater body weight. A working ranch at Hacienda La Pacifica also explain their population boom in Santa Rosa. "Howlers are more resilient than capuchins and spider monkeys for several reasons," Fedigan explains. "They can live within a small home range, as long as the trees have the right food for them. Spider monkeys, on the other hand, occupy a huge home range, so they can't make it in fragmented habitat."

**E.** Howlers also reproduce faster than do other monkey species in the area. Capuchins don't bear their first young until about 7 years old, and spider monkeys do so even later, but howlers give birth for the first time at about 3.5 years of age. Also, while a female spider monkey will have a baby about once every four years, well-fed howlers can produce an infant every two years.

**F.** The leaves howlers eat hold plenty of water, so the monkeys can survive away from open streams and water holes. This ability gives them a real advantage over capuchin and spider monkeys, which have suffered during the long, ongoing drought in Guanacaste.

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**G.** Growing human population pressures in Central and South America have led to persistent destruction of forests. During the 1990s, about 1.1 million acres of Central American forest were felled yearly. Alejandro Estrada, an ecologist at Estacion de Biologia Los Tuxtlas in Veracruz, Mexico, has been exploring how monkeys survive in a landscape increasingly shaped by humans. He and his colleagues recently studied the ecology of a group of mantled howler monkeys that thrive in a habitat completely altered by humans: a cacao plantation in Tabasco, Mexico. Like many varieties of coffee, cacao plants need shade to grow, so 40 years ago the landowners planted fig, monkey pod and other tall trees to form a protective canopy over their crop. The howlers moved in about 25 years ago after nearby forests were cut. This strange habitat, a hodgepodge of cultivated native and exotic plants, seems to support about as many monkeys as would a same-sized patch of wild forest. The howlers eat the leaves and fruit of the shade trees, leaving the valuable cacao pods alone, so the farmers tolerate them.

**H.** Estrada believes the monkeys bring underappreciated benefits to such farms, dispersing the seeds of fig and other shade trees and fertilizing the soil with feces. He points out that howler monkeys live in shade coffee and cacao plantations in Nicaragua and Costa Rica as well as in Mexico. Spider monkeys also forage in such plantations, though they need nearby areas of forest to survive in the long term. He hopes that farmers will begin to see the advantages of associating with wild monkeys, which includes potential ecotourism projects. "Conservation is usually viewed as a conflict between agricultural practices and the need to preserve nature," Estrada says. "We're moving away from that vision and beginning to consider ways in which agricultural activities may become a tool for the conservation of primates in human-modified landscapes."

## Questions 1-6

*The passage contains eight paragraphs, A-H.*

*Which paragraph contains the following information?*

*Write the correct letter, A-H.*

- Q1. A reference of rate of reduction in forest habitats .....
- Q2. An area where only one species of monkey survived while other two species vanished .....
- Q3. A reason for howler monkey of choose new leaves as food over old ones .....
- Q4. Mention to howler monkey's diet and eating habits .....
- Q5. A reference of asking farmers' changing attitude toward wildlife .....
- Q6. The advantage for howler monkey's flexibility living in a segmented habitat .....

## TEST 9 - Leaf-Cutting Ants and Fungus

**A.** The ants and their agriculture have been extensively studied over the years, but the recent research has uncovered intriguing new findings about the fungus they cultivate, how they domesticated it and how they cultivate it and preserve it from pathogens. For example, the fungus farms, which the ants were thought to keep free of pathogens, turn out to be vulnerable to a devastating mold, found nowhere else but in ants' nests. To keep the mold in check, the ants long ago made a discovery that would do credit to any pharmaceutical laboratory.

**B.** Leaf-cutting ants and their fungus farms are a marvel of nature and perhaps the best known example of symbiosis, the mutual dependence of two species. The ants' achievement is remarkable the biologist Edward O. Wilson has called it "one of the major breakthroughs in animal evolution" because it allows them to eat, courtesy of their mushroom's digestive powers, the otherwise poisoned harvest of tropical forests whose leaves are laden with terpenoids, alkaloids and other chemicals designed to sicken browsers.

**C.** Fungus growing seems to have originated only once in evolution, because all gardening ants belong to a single tribe, the descendants of the first fungus farmer. There are more than 200 known species of the attine ant tribe, divided into 12 groups, or genera. The leaf-cutters use fresh vegetation; the other groups, known as the lower attines because their nests are smaller and their techniques more primitive, feed their gardens with detritus like dead leaves, insects and feces.

**D.** The leaf-cutters' fungus was indeed descended from a single strain, propagated clonally, or just by budding, for at least 23 million years. But the lower attine ants used different varieties of the fungus, and in one case a quite separate species, the four biologists discovered. The pure strain of fungus grown by the leaf-cutters, it seemed to Mr. Currie, resembled the monocultures of various human crops, that are very productive for a while and then succumb to some disastrous pathogen, such as the Irish potato blight. Monocultures, which lack the genetic diversity to respond to changing environmental threats, are sitting ducks for parasites. Mr. Currie felt there had to be a parasite in the ant-fungus system. But a century of ant research offered no support for the idea. Textbooks describe how leaf-cutter ants scrupulously weed their gardens of all foreign organisms. "People kept telling me, 'You know the ants keep their gardens free of parasites, don't you?'" "Mr. Currie said of his efforts to find a hidden interloper.

**E.** But after three years of sifting through attine ant gardens, Mr. Currie discovered they are far from free of infections. In last month's issue of the Proceedings of the National Academy of Sciences, he and two colleagues, Dr. Mueller and David Mairoch, isolated several alien organisms, particularly a family of parasitic molds called Escovopsis.

**F.** Escovopsis turns out to be a highly virulent pathogen that can devastate a fungus garden in a couple of days. It blooms like a white cloud, with the garden dimly visible underneath. In a day or two the whole garden is enveloped. "Other ants won't go near it and the ants associated with the garden just starve to death," Dr. Rehner said. "They just seem to give up, except for those that have rescued their larvae." The deadly mold then turns greenish-brown as it enters its spore-forming stage.

**G.** Evidently the ants usually manage to keep Escovopsis and other parasites under control. But with any lapse in control, or if the ants are removed, Escovopsis will quickly burst forth. Although new leaf-cutter gardens start off free of Escovopsis, within two years some 60 percent become infected. The discovery of Escovopsis's role brings a new level of understanding to the evolution of the attine ants. "In the last decade, evolutionary biologists have been increasingly aware of the role of parasites as driving forces in



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evolution,"Dr. Schultz said. There is now a possible reason to explain why the lower attine species keep changing the variety of fungus in their mushroom gardens, and occasionally domesticating new ones—to stay one step ahead of the relentless Escovopsis.

**H.** Interestingly, Mr. Currie found that the leaf-cutters had in general fewer alien molds in their gardens than the lower attines, yet they had more Escovopsis infections. It seems that the price they pay for cultivating a pure variety of fungus is a higher risk from Escovopsis. But the leaf-cutters may have little alternative: they cultivate a special variety of fungus which, unlike those grown by the lower attines, produces nutritious swollen tips for the ants to eat.

**I.** Discovery of a third partner in the ant-fungus symbiosis raises the question of how the attine ants, especially the leaf-cutters, keep this dangerous interloper undercontrol. Amazingly enough, Mr. Currie has again provided the answer. "People have known for a hundred years that ants have a whitish growth on the cuticle,"said Dr. Mueller, referring to the insects'body surface. "People would say this is like a cuticular wax. But Cameron was the first one in a hundred years to put these things under a microscope. He saw it was not inert wax. It is alive."Mr. Currie discovered a specialized patch on the ants'cuticle that harbors a particular kind of bacterium, one well known to the pharmaceutical industry, because it is the source of half the antibiotics used in medicine. From each of 22 species of attine ant studied, Mr. Cameron and colleagues isolated a species of Streptomyces bacterium, they reported in Nature in April. The Streptomyces does not have much effect on ordinary laboratory funguses. But it is a potent poisoner of Escovopsis, inhibiting its growth and suppressing spore formation. It also stimulates growth of the ants'mushroom fungus. The bacterium is carried by virgin queens when they leave to establish new nests, but is not found on male ants, playboys who take no responsibility in nest-making or gardening.

**J.** Because both the leaf-cutters and the lower attines use Streptomyces, the bacterium may have been part of their symbiosis for almost as long as the Escovopsis mold. If so, some Alexander Fleming of an ant discovered antibiotics millions of years before people did. Even now, the ants are accomplishing two feats beyond the powers of human technology. The leafcutters are growing a monocultural crop year after year without disaster, and they are using an antibiotic apparently so wisely and prudently that, unlike people, they are not provoking antibiotic resistance in the target pathogen.

## Questions 1-5

*The passage contains ten paragraphs, A-J.*

*Which paragraph contains the following information?*

*Write the correct letter, A-J.*

- Q1. Dangerous outcome of Escovopsis .....
- Q2. Risk of growing single fungus .....
- Q3. Comparison of features of two different nests for feeding .....
- Q4. Discovery of significant achievements made by ants earlier than human .....
- Q5. Advantage of growing new breed of fungus in the ant farm .....

## **TEST 10 – Antarctica – in from the cold?**

**A.** A little over a century ago, men of the ilk of Scott, Shackleton and Mawson battled against Antarctica's blizzards, cold and deprivation. In the name of Empire and in an age of heroic deeds they created an image of Antarctica that was to last well into the 20th century an image of remoteness, hardship, bleakness and isolation that was the province of only the most courageous of men. The image was one of a place removed from everyday reality, of a place with no apparent value to anyone.

**B.** As we enter the 21st century, our perception of Antarctica has changed. Although physically Antarctica is no closer and probably no warmer, and to spend time there still demands a dedication not seen in ordinary life, the continent and its surrounding ocean are increasingly seen to be an integral part of Planet Earth, and a key component in the Earth System. Is this because the world seems a little smaller these days, shrunk by TV and tourism, or is it because Antarctica really does occupy a central spot on Earth's mantle? Scientific research during the past half century has revealed—and continues to reveal—that Antarctica's great mass and low temperature exert a major influence on climate and ocean circulation, factors which influence the lives of millions of people all over the globe.

**C.** Antarctica was not always cold. The slow break-up of the super-continent Gondwana with the northward movements of Africa, South America, India and Australia eventually created enough space around Antarctica for the development of an Antarctic Circumpolar Current (ACC), that flowed from west to east under the influence of the prevailing westerly winds. Antarctica cooled, its vegetation perished, glaciation began and the continent took on its present-day appearance. Today the ice that overlies the bedrock is up to 4km thick, and surface temperatures as low as -89.2deg C have been recorded. The icy blast that howls over the ice cap and out to sea—the so-called katabatic wind—can reach 300 km/hr, creating fearsome wind-chill effects,

**D.** Out of this extreme environment come some powerful forces that reverberate around the world. The Earth's rotation, coupled to the generation of cells of low pressure off the Antarctic coast, would allow Astronauts a view of Antarctica that is as beautiful as it is awesome. Spinning away to the northeast, the cells grow and deepen, whipping up the Southern Ocean into the mountainous seas so respected by mariners. Recent work is showing that the temperature of the ocean may be a better predictor of rainfall in Australia than is the pressure difference between Darwin and Tahiti—the Southern Oscillation Index. By receiving more accurate predictions, graziers in northern Queensland are able to avoid overstocking in years when rainfall will be poor. Not only does this limit their losses but it prevents serious pasture degradation that may take decades to repair. CSIRO is developing this as a prototype forecasting system, but we can confidently predict that as we know more about the Antarctic and Southern Ocean we will be able to enhance and extend our predictive ability.

**E.** The ocean's surface temperature results from the interplay between deepwater temperature, air temperature and ice. Each winter between 4 and 19 million square km of sea ice form, locking up huge quantities of heat close to the continent. Only now can we start to unravel the influence of sea ice on the weather that is experienced in southern Australia. But in another way the extent of sea ice extends its influence far beyond Antarctica. Antarctic krill the small shrimp-like crustaceans that are the staple diet for baleen whales, penguins, some seals, flighted sea birds and many fish—breed well in years when sea ice is extensive and poorly when it is not. Many species of baleen whales and flighted sea birds migrate between the hemispheres and when the krill are less abundant they do not thrive.

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F. The circulatory system of the world's oceans is like a huge conveyor belt, moving water and dissolved minerals and nutrients from one hemisphere to the other, and from the ocean's abyssal depths to the surface. The ACC is the longest current in the world, and has the largest flow. Through it, the deep flows of the Atlantic, Indian and Pacific Oceans are joined to form part of a single global thermohaline circulation. During winter, the howling katabatics sometimes scour the ice off patches of the sea's surface leaving large ice locked lagoons, or 'polynyas'. Recent research has shown that as fresh sea ice forms, it is continuously stripped away by the wind and may be blown up to 90km in a single day. Since only fresh water freezes into ice, the water that remains becomes increasingly salty and dense, sinking until it spills over the continental shelf. Cold water carries more oxygen than warm water, so when it rises, well into the northern hemisphere, it reoxygenates and revitalises the ocean. The state of the northern oceans, and their biological productivity, owe much to what happens in the Antarctic.

## Questions 1-5

*The passage contains six paragraphs, A-F.*

*Which paragraph contains the following information?*

*Write the correct letter, A-F.*

- Q1. The example of a research on building weather prediction for agriculture .....
- Q2. An explanation of how Antarctic sea ice brings back oceans' vitality .....
- Q3. The description of a food chain that influences animals' living pattern .....
- Q4. The reference of an extreme temperature and a cold wind in Antarctica .....
- Q5. The reference of how Antarctica was once thought to be a forgotten and insignificant continent .....

## TABLE COMPLETION

Mini warm-up practice test – Complete the table below

### The Bridge that swayed

When the London Millennium footbridge was opened in June 2000, it swayed alarmingly. This generated huge public interest and the bridge became known as London's "wobbly bridge." The Millennium Bridge is the first new bridge across the river Thames in London since Tower Bridge opened in 1894, and it is the first ever designed for pedestrians only. The bridge links the City of London near St Paul's Cathedral with the Tate Modern art gallery on Bankside.

The bridge opened initially on Saturday 10th June 2000. For the opening ceremony, a crowd of over 1,000 people had assembled on the south half of the bridge with a band in front. When they started to walk across with the band playing, there was immediately an unexpectedly pronounced lateral movement of the bridge deck. "It was a fine day and the bridge was on the route of a major charity walk," one of the pedestrians recounted what he saw that day.

"At first, it was still. Then it began to sway sideways, just slightly. Then, almost from one moment to the next, when large groups of people were crossing, the wobble intensified. Everyone had to stop walking to retain balance and sometimes to hold onto the hand rails for support." Immediately it was decided to limit the number of people on the bridge, and the bridge was dubbed the 'wobbly' bridge by the media who declared it another high-profile British Millennium Project failure. In order to fully investigate and resolve the issue the decision was taken to close the bridge on 12th June 2000.

Arup, the leading member of the committee in charge of the construction of the bridge, decided to tackle the issue head on. They immediately undertook a fast-track research project to seek the cause and the cure. The embarrassed engineers found the videotape that day which showed the center span swaying about 3 inches sideways every second and the south span 2 inches every 1.25 seconds. Because there was a significant wind blowing on the opening days (force 3-4) and the bridge had been decorated with large flags, the engineers first thought that winds might be exerting excessive force on the many large flags and banners, but it was rapidly concluded that wind buffeting had not contributed significantly to vibration of the bridge. But after measurements were made in university laboratories of the effects of people walking on swaying platforms and after large-scale experiments with crowds of pedestrians were conducted on the bridge itself, a new understanding and a new theory were developed.

The unexpected motion was the result of a natural human reaction to small lateral movements. It is well known that a suspension bridge has tendency to sway when troops march over it in lockstep, which is why troops are required to break step when crossing such a bridge. "If we walk on a swaying surface we tend to compensate and stabilise ourselves by spreading our legs further apart but this increases the lateral push". Pat Dallard, the engineer at Arup, says that you change the way you walk to match what the bridge is doing. It is an unconscious tendency for pedestrians to match their footsteps to the sway, thereby exacerbating it even more. "It's rather like walking on a rolling ship deck you move one way and then the other to compensate for the roll." The way people walk doesn't have to match exactly the natural frequency of the bridge as in resonance the interaction is more subtle. As the bridge moves, people adjust the way they walk in their own manner. The problem is that when there are enough people on the bridge the total sideways push can overcome the bridge's ability to absorb it. The movement becomes excessive and continues to increase until people begin to have difficulty in walking they may even have to hold on to the rails.

Professor Fujino Yozo of Tokyo University, who studied the earth-resistant Toda Bridge in Japan, believes the horizontal forces caused by walking, running or jumping could also in turn cause excessive dynamic vibration in the lateral direction in the bridge. He explains that as the structure began moving,

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pedestrians adjusted their gait to the same lateral rhythm as the bridge; the adjusted footsteps magnified the motion just like when four people all stand up in small boat at the same time. As more pedestrians locked into the same rhythm, the increasing oscillation led to the dramatic swaying captured on film until people stopped walking altogether, because they could not even keep upright.

In order to design a method of reducing the movements, an immediate research program was launched by the bridge's engineering designer Arup. It was decided that the force exerted by the pedestrians had to be quantified and related to the motion of the bridge. Although there are some descriptions of this phenomenon in existing literature, none of these actually quantifies the force. So there was no quantitative analytical way to design the bridge against this effect. The efforts to solve the problem quickly got supported by a number of universities and research organisations.

The tests at the University of Southampton involved a person walking on the spot on a small shake table. The tests at Imperial College involved persons walking along a specially built, 7.2m-long platform, which could be driven laterally at different frequencies and amplitudes. These tests have their own limitations. While the Imperial College test platform was too short that only seven or eight steps could be measured at one time, the "walking on the spot" test did not accurately replicate forward walking, although many footsteps could be observed using this method. Neither test could investigate any influence of other people in a crowd on the behavior of the individual tested.

The results of the laboratory tests provided information which enabled the initial design of a retrofit to be progressed. However, unless the usage of the bridge was to be greatly restricted, only two generic options to improve its performance were considered feasible. The first was to increase the stiffness of the bridge to move all its lateral natural frequencies out of the range that could be excited by the lateral footfall forces, and the second was to increase the damping of the bridge to reduce the resonant response.

### Questions 1-3

*Complete the table below.*

*Choose **NO MORE THAN THREE WORDS** from the passage for each answer.*

Tests conducted by	Problems of the test
Q1. _____	Not enough data collection
Q2. _____	Not long enough
Q3. _____	Not like the real walking experience



## TEST 1 - Children's Literature

Stories and poems aimed at children have an exceedingly long history: lullabies, for example, were sung in Roman times, and a few nursery games and rhymes are almost as ancient. Yet so far as written-down literature is concerned, while there were stories in print before 1700 that children often seized on when they had the chance, such as translations of Aesop's fables, fairy-stories and popular ballads and romances, these were not aimed at young people in particular. Since the only genuinely child-oriented literature at this time would have been a few instructional works to help with reading and general knowledge, plus the odd Puritanical tract as an aid to morality, the only course for keen child readers was to read adult literature. This still occurs today, especially with adult thrillers or romances that include more exciting, graphic detail than is normally found in the literature for younger readers.

By the middle of the 18th century there were enough eager child readers, and enough parents glad to cater to this interest, for publishers to specialize in children's books whose first aim was pleasure rather than education or morality. In Britain, a London merchant named Thomas Boreham produced *Cajanus*, *The Swedish Giant* in 1742, while the more famous John Newbery published *A Little Pretty Pocket Book* in 1744. Its contents - rhymes, stories, children's games plus a free gift ('A ball and a pincushion') in many ways anticipated the similar lucky-dip contents of children's annuals this century. It is a tribute to Newbery's flair that he hit upon a winning formula quite so quickly, to be pirated almost immediately in America.

Such pleasing levity was not to last. Influenced by Rousseau, whose *Emile* (1762) decreed that all books for children save *Robinson Crusoe* were a dangerous diversion, contemporary critics saw to it that children's literature should be instructive and uplifting. Prominent among such voices was Mrs. Sarah Trimmer, whose magazine *The Guardian of Education* (1802) carried the first regular reviews of children's books. It was she who condemned fairy-tales for their violence and general absurdity; her own stories, *Fabulous Histories* (1786) described talking animals who were always models of sense and decorum.

So the moral story for children was always threatened from within, given the way children have of drawing out entertainment from the sternest moralist. But the greatest blow to the improving children's book was to come from an unlikely source indeed: early 19th century interest in folklore. Both nursery rhymes, selected by James Orchard Halliwell for a folklore society in 1842, and collection of fairy-stories by the scholarly Grimm brothers, swiftly translated into English in 1823, soon rocket to popularity with the young, quickly leading to new editions, each one more child-centered than the last. From now on younger children could expect stories written for their particular interest and with the needs of their own limited experience of life kept well to the fore.

What eventually determined the reading of older children was often not the availability of special children's literature as such but access to books that contained characters, such as young people or animals, with whom they could more easily empathize, or action, such as exploring or fighting, that made few demands on adult maturity or understanding.

The final apotheosis of literary childhood as something to be protected from unpleasant reality came with the arrival in the late 1930s of child-centered best-sellers intent on entertainment at its most escapist. In Britain novelist such as Enid Blyton and Richmal Crompton described children who were always free to have the most unlikely adventures, secure in the knowledge that nothing bad could ever happen to them in the end. The fact that war broke out again during her books' greatest popularity fails to register at all in the self-enclosed world inhabited by Enid Blyton's young characters. Reaction against such dream-worlds was inevitable after World War II, coinciding with the growth of paperback sales, children's libraries and a new spirit of moral and social concern. Urged on by committed publishers and progressive librarians, writers slowly began to explore new areas of interest while also shifting the settings of their plots from the middle-class world to which their chiefly adult patrons had always previously belonged.

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Critical emphasis, during this development, has been divided. For some the most important task was to rid children's books of the social prejudice and exclusiveness no longer found acceptable. Others concentrated more on the positive achievements of contemporary children's literature. That writers of these works are now often recommended to the attentions of adult as well as child readers echoes the 19th-century belief that children's literature can be shared by the generations, rather than being a defensive barrier between childhood and the necessary growth towards adult understanding.

### Questions 1-5

Complete the table below.

Choose **NO MORE THAN TWO WORDS** from the passage for each answer.

DATE	FEATURES	AIM	EXAMPLE
Before 1700	Not aimed at young children	Education and morality	Puritanical tract
By the middle of 18 <sup>th</sup> century	Collection of Q1 _____ and games	Read for pleasure	A Little Pretty Pocket Book (exported to Q2 _____)
Early 19 <sup>th</sup> century	Growing interest in Q3 _____	To be more children-centered	Nursery rhymes and Q4 _____
Late 1930s	Stories of harm-free Q5 _____	Entertainment	Enid Blyton and Richarnal Crompton's novels

## TEST 2 - Travel Books

There are many reasons why individuals have travelled beyond their own societies. Some travellers may have simply desired to satisfy curiosity about the larger world. Until recent times, however, travellers did start their journey for reasons other than mere curiosity. While the travellers' accounts give much valuable information on these foreign lands and provide a window for the understanding of the local cultures and histories, they are also a mirror to the travellers themselves, for these accounts help them to have a better understanding of themselves. Records of foreign travel appeared soon after the invention of writing, and fragmentary travel accounts appeared in both Mesopotamia and Egypt in ancient times. After the formation of large, imperial states in the classical world, travel accounts emerged as a prominent literary genre in many lands, and they held especially strong appeal for rulers desiring useful knowledge about their realms. The Greek historian Herodotus reported on his travels in Egypt and Anatolia in researching the history of the Persian wars. The Chinese envoy Zhang Qian described much of central Asia as far west as Bactria (modern-day Afghanistan) on the basis of travels undertaken in the first century BCE while searching for allies for the Han dynasty. Hellenistic and Roman geographers such as Ptolemy, Strabo, and Pliny the Elder relied on their own travels through much of the Mediterranean world as well as reports of other travellers to compile vast compendia of geographical knowledge.

During the post-classical era (about 500 to 1500 CE), trade and pilgrimage emerged as major incentives for travel to foreign lands. Muslim merchants sought trading opportunities throughout much of the eastern hemisphere. They described lands, peoples, and commercial products of the Indian Ocean basin from East Africa to Indonesia, and they supplied the first written accounts of societies in sub-Saharan West Africa. While merchants set out in search of trade and profit, devout Muslims travelled as pilgrims to Mecca to make their hajj and visit the holy sites of Islam. Since the prophet Muhammad's original pilgrimage to Mecca, untold millions of Muslims have followed his example, and thousands of hajj accounts have related their experiences. East Asian travelers were not quite so prominent as Muslims during the post-classical era, but they too followed many of the highways and sea lanes of the eastern hemisphere. Chinese merchants frequently visited South-East Asia and India, occasionally venturing even to East Africa, and devout East Asian Buddhists undertook distant pilgrimages. Between the 5th and 9th centuries CE, hundreds and possibly even thousands of Chinese Buddhists travelled to India to study with Buddhist teachers, collect sacred texts, and visit holy sites. Written accounts recorded the experiences of many pilgrims, such as Faxian, Xuanzang, and Yijing. Though not so numerous as the Chinese pilgrims, Buddhists from Japan, Korea, and other lands also ventured abroad in the interests of spiritual enlightenment.

Medieval Europeans did not hit the roads in such large numbers as their Muslim and East Asian counterparts during the early part of the post-classical era, although gradually increasing crowds of Christian pilgrims flowed to Jerusalem, Rome, Santiago de Compostela (in northern Spain), and other sites. After the 12th century, however, merchants, pilgrims, and missionaries from medieval Europe travelled widely and left numerous travel accounts, of which Marco Polo's description of his travels and sojourn in China is the best known. As they became familiar with the larger world of the eastern hemisphere - and the profitable commercial opportunities that it offered - European peoples worked to find new and more direct routes to Asian and African markets. Their efforts took them not only to all parts of the eastern hemisphere, but eventually to the Americas and Oceania as well. If Muslim and Chinese peoples dominated travel and travel writing in postclassical times, European explorers, conquerors, merchants, and missionaries took centre stage during the early modern era (about 1500 to 1800 CE). By no means did Muslim and Chinese travel come to a halt in early modern times. But European peoples ventured to the distant corners of the globe, and European printing presses churned out thousands of travel accounts that described foreign lands and peoples for a reading public with an apparently insatiable appetite for news about the larger world. The volume of travel literature was so great that several editors, including Giambattista Ramusio, Richard Hakluyt, Theodore de Biy, and Samuel Purchas, assembled numerous travel accounts and made them available in enormous published collections. During the 19th century, European travellers made their way to the interior

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regions of Africa and the Americas, generating a fresh round of travel writing as they did so. Meanwhile, European colonial administrators devoted numerous writings to the societies of their colonial subjects, particularly in Asian and African colonies they established. By mid-century, attention was flowing also in the other direction. Painfully aware of the military and technological prowess of European and Euro-American societies, Asian travellers in particular visited Europe and the United States in hopes of discovering principles useful for the organisation of their own societies. Among the most prominent of these travellers who made extensive use of their overseas observations and experiences in their own writings were the Japanese reformer Fukuzawa Yukichi and the Chinese revolutionary Sun Yat-sen.

With the development of inexpensive and reliable means of mass transport, the 20th century witnessed explosions both in the frequency of long-distance travel and in the volume of travel writing. While a great deal of travel took place for reasons of business, administration, diplomacy, pilgrimage, and missionary work, as in ages past, increasingly effective modes of mass transport made it possible for new kinds of travel to flourish. The most distinctive of them was mass tourism, which emerged as a major form of consumption for individuals living in the world's wealthy societies. Tourism enabled consumers to get away from home to see the sights in Rome, take a cruise through the Caribbean, walk the Great Wall of China, visit some wineries in Bordeaux, or go on safari in Kenya. A peculiar variant of the travel account arose to meet the needs of these tourists: the guidebook, which offered advice on food, lodging, shopping, local customs, and all the sights that visitors should not miss seeing. Tourism has had a massive economic impact throughout the world, but other new forms of travel have also had considerable influence in contemporary times.

### Questions 1-8

Complete the table below.

Choose **NO MORE THAN TWO WORDS** from the passage for each answer.

TIME	TRAVELLER	DESTINATION	PURPOSE OF TRAVEL
Classical Greece	Herodotus	Egypt and Anatolia	To gather information for the study of Q1 _____
Han Dynasty	Zhang Qian	Central Asia	To seek Q2 _____
Roman Empire	Ptolemy, Strabo, Pliny the Elder	The Mediterranean	To acquire Q3 _____
Post-classical era (about 500 to 1500 CE)	Muslims	From East Africa to Indonesia, Mecca	For trading and Q4 _____
5 <sup>th</sup> – 9 <sup>th</sup> Centuries CE	Chinese Buddhists	Q5 _____	To collect and Buddhist texts and for spiritual enlightenment.
Early modern era (about 1500 to 1800 CE)	European explorers	The New World	To satisfy public curiosity for the New World
During 19 <sup>th</sup> century	Colonial administrations	Asia, Africa	To provide information for the Q6 _____ they set up
By mid-century of the 1800s	Sun Yat-sen, Fukuzawa Yukichi	Europe and the United States	To study the Q7 _____ of their societies
20 <sup>th</sup> century	People from Q8 _____ countries	Mass Tourism	For entertainment and pleasure



## TEST 3 – The Development of Plastics

When rubber was first commercially produced in Europe during the nineteenth century, it rapidly became a very important commodity, particularly in the fields of transportation and electricity. However, during the twentieth century a number of new synthetic materials, called plastics, superseded natural rubber in all but a few applications.

Rubber is a polymer—a compound containing large molecules that are formed by the bonding of many smaller, simpler units, repeated over and over again. The same bonding principle—polymerization—underlies the creation of a huge range of plastics by the chemical industry.

The first plastic was developed as a result of a competition in the USA. In the 1860s, \$10,000 was offered to anybody who could replace ivory—supplies of which were declining—with something equally good as a material for making billiard balls. The prize was won by John Wesley Hyatt with a material called celluloid. Celluloid was made by dissolving cellulose, a carbohydrate derived from plants, in a solution of camphor dissolved in ethanol. This new material rapidly found uses in the manufacture of products such as knife handles, detachable collars and cuffs, spectacle frames and photographic film. Without celluloid, the film industry could never have got off the ground at the end of the 19th century.

Celluloid can be repeatedly softened and reshaped by heat, and is known as a thermoplastic. In 1907, Leo Baekeland, a Belgian chemist working in the USA, invented a different kind of plastic, by causing phenol and formaldehyde to react together. Baekeland called the material Bakelite, and it was the first of the thermosets—plastics that can be cast and moulded while hot, but cannot be softened by heat and reshaped once they have set. Bakelite was a good insulator, and was resistant to water, acids and moderate heat. With these properties it was soon being used in the manufacture of switches, household items such as knife handles, and electrical components for cars.

Soon chemists began looking for other small molecules that could be strung together to make polymers. In the 1930s British chemists discovered that the gas ethylene would polymerize under heat and pressure to form a thermoplastic they called polythene. Polypropylene followed in the 1950s. Both were used to make bottles, pipes and plastic bags. A small change in the starting material—replacing a hydrogen atom in ethylene with a chlorine atom—produced PVC (polyvinyl chloride), a hard, fireproof plastic suitable for drains and gutters. And by adding certain chemicals, a soft form of PVC could be produced, suitable as a substitute for rubber in items such as waterproof clothing. A closely related plastic was Teflon, or PTFE (polytetrafluoroethylene).

This had a very low coefficient of friction, making it ideal for bearings, rollers, and non-stick frying pans. Polystyrene, developed during the 1930s in Germany, was a clear, glass-like material, used in food containers, domestic appliances and toys. Expanded polystyrene a white, rigid foam was widely used in packaging and insulation. Polyurethanes, also developed in Germany, found uses as adhesives, coatings, and—in the form of rigid foams as insulation materials. They are all produced from chemicals derived from crude oil, which contains exactly the same elements carbon and hydrogen as many plastics.

The first of the man-made fibres, nylon, was also created in the 1930s. Its inventor was a chemist called Wallace Carothers, who worked for the Du Pont company in the USA. He found that under the right conditions, two chemicals hexamethylenediamine and adipic acid would form a polymer that could be pumped out through holes and then stretched to form long glossy threads that could be woven like silk. Its first use was to make parachutes for the US armed forces in World War H. In the post-war years nylon completely replaced silk in the manufacture of stockings. Subsequently many other synthetic fibres joined nylon, including Orion, Acrilan and Terylene. Today most garments are made of a blend of natural fibres, such as cotton and wool, and man-made fibres that make fabrics easier to look after.

The great strength of plastic is its indestructibility. However, this quality is also something of a drawback: beaches all over the world, even on the remotest islands, are littered with plastic bottles that nothing can destroy. Nor is it very easy to recycle plastics, as different types of plastic are often used in the same items and call for different treatments. Plastics can be made biodegradable by incorporating into their



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structure a material such as starch, which is attacked by bacteria and causes the plastic to fall apart. Other materials can be incorporated that gradually decay in sunlight although bottles made of such materials have to be stored in the dark, to ensure that they do not disintegrate before they have been used.

### Questions 1-7

Complete the table below.

Choose **NO MORE THAN THREE WORDS** from the passage for each answer.

NAME OF PLASTIC	DATE OF INVENTION	ORIGINAL REGION	PROPERTY	COMMON USE
Celluloid	1860s	US		Q1. _____
Q2. _____	1907	US	Can be cast and moulded but cannot be softened by heat	Q3. _____
Polythene	1930	Q4. _____		Bottles
Rigid PVC			Q5. _____	
Polystyrene	1930s	Germany	Q6. _____	Food container
Polyurethanes		Germany	Q7. _____ foams	Adhesives, coatings and insulation

## **TEST 4 – Nature's Most Violent Wind**

**A.** Tornadoes have been observed in every continent on the planet with the exception of Antarctica. Hurricanes differ from tornadoes, in that the former develop in warm, tropical oceans whereas tornadoes develop on land and are more aggressive and potentially destructive. The majority of tornadoes are initiated by thunderstorms. Tornadoes are relatively common occurrences at differing magnitudes throughout the world. The geographical features of the U.S.A. lend themselves to high incidence of tornado activity. In that country the highest proportion of tornadoes occur in the southern states in spring from March to May and in the northern states from late spring extending into summer. Generally tornadoes travel from southwest to northeast, though neither time of year nor direction they will take is completely predictable.

**B.** Several factors cause the U.S.A. to experience a high incidence of tornado formation. While the continent reaches from arctic areas in the north to a tropical climate in the south there is no barrier protection from significant mountain ranges in the east or west; however, the Rocky Mountains in the middle latitudes of the country obstruct atmospheric flow and moisture. In addition, drier air from the southwest deserts and low level moisture from the Gulf of Mexico meet in the area, many collisions of warm and cool air occur and optimum conditions for tornado formation are created. Tornadoes in this central part of the U.S.A. are so prolific that the area has been named Tornado Alley, the site of the highest number of powerful tornadoes in the country and throughout the world. In the USA alone, in an average year 1200 tornadoes occur causing 70 fatalities and 1500 injuries and in addition extensive damage to property and natural vegetation.

**C.** Connected between a cloud base above (usually cumulonimbus) and the earth below, a tornado is a rapidly rotating column of air; they can be as much as 20 kilometres in height. The majority are less than 75 metres in diameter reaching wind speeds of less than 177kms per hour and travel less than 10 kilometres before dissipating; however, some of the larger and rarer of this type of weather phenomenon may reach wind speeds of more than 480kms/hour traveling more than 100 kilometers before cessation. The inside of a tornado is made up of descending air and this is surrounded by a spiraling upward current which has the ability to carry with it and destroy even substantial obstacles such as trees, cars and houses in its path. Scientific research and eyewitness accounts indicate that most tornadoes also possess a calm centre in their core, surrounded by the layers of the downward and upward currents of air; this core has been likened to the peaceful central 'eye' at the centre of a tropical cyclone or hurricane.

**D.** A tornado itself is not necessarily visible; though the intense low pressure it causes often results in condensation of water vapour which forms into a noticeable condensation funnel. Colours of tornadoes are also dictated by the environment in which they form. The force of the swirling air causes them to pick up dirt as they travel across the landscape; those with minimal debris remaining grey or white turning darker blue the more they collect, while others in areas such as the Great Plains in the USA turn red in colour due to the red soil they collect and carry with them. Background lighting in which a tornado presents itself also affects the naked eye's ability to identify its form as it appears on the horizon. When viewing a tornado with the sun behind it, it will appear to be dark in colour; however, when viewed without the sun in the background, the same tornado appears to be grey or white. On the rare occasions that tornadoes occur after dark, they pose an increased level of danger as darkness can make them invisible and only radar warnings or possibly sound can warn those in their path that a tornado is on its way.

**E.** Tornadoes are classified into three levels of intensity; these being weak, strong and violent. 88% of tornadoes occurring in the USA are classified into the first category making them the most common; they account for less than 5% of fatalities resulting from tornado activity, generally reach wind speeds of less than 177kms/hour and have a duration of between 1 and 10 minutes before cessation. In contrast, 'violent' tornadoes exceed 330 kilometres per hour, can continue for over an hour and while they account for only 1%

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of incidence of tornados they result in approximately 70% of resultant deaths. The greatest devastation to date, inflicted on the USA by a violent tornado was on March 18th, 1925. The tornado was the longest, fastest and widest tornado known to have formed in North America and resulted in 695 deaths, an additional 2279 being injured. Now known as the Tri-state Tornado, it travelled over 350 kilometres affecting 13 counties in the three different states of Missouri, Illinois and Indiana. Around 11% of tornados are classified as 'strong' tornados. These tornados account for slightly more than 25% of tornado-related fatal accidents and reach mid-range speeds of between 177 and 330 kilometres per hour with an average duration of around 20 minutes.

F. Today in the USA, early warning systems, which cannot necessarily protect property in the path of a tornado, can allow people time to leave the area and therefore significantly reduce death tolls. However in countries such as Bangladesh, fatalities caused by tornado impact remain extremely high. The rural, central region of the country also experiences a high frequency of strong tornados and the danger is exacerbated due to its densely populated areas, lack of warning systems and vulnerability of building structures. Between 1967 and 1996 the Bangladesh Observer and Pakistan Observer reported 5,373 tornado related deaths: an average of 179.1 per year. The Manikganj Tornado which occurred in 1989 is thought to have caused as many as 1300 deaths and is known as the deadliest tornado to have occurred anywhere in the world. Many projects delivered by organizations such as the Asian Disaster Reduction Centre (ADRC) have been established with the aim of minimizing devastation and death rates caused by tornados in such areas.

### Questions 1-5

Complete the table below.

Choose **NO MORE THAN THREE WORDS** from the passage for each answer.

CLASSIFICATION	WEAK	STRONG	VIOLENT
Incidence	make up Q1. _____ of tornados in the USA	make up about Q2. _____ of tornados in the USA	make up the smallest minority of tornados in the USA
Wind speed	less than 177 kms / hr	between 177 and 330 kms / hr	more than 330 kms / hr
Lifespan	1-10 minutes	20 minutes	can last for Q3. _____
Impact	cause less than 5% of tornado related deaths	cause just over Q4. _____ of tornado related to deaths	The most violent example in the USA was the Q5. _____

## **TEST 5 – The Disease Multiple Sclerosis**

**A.** Multiple Sclerosis (MS) is a disease in which the patient's immune system attacks the central nervous system. This can lead to numerous physical and mental symptoms, as the disease affects the transmission of electrical signals between the body and the brain. However, the human body, being a flexible, adaptable system, can compensate for some level of damage, so a person with MS can look and feel fine even though the disease is present.

**B.** MS patients can have one of two main varieties of the disease: the relapsing form and the primary progressive form. In the relapsing form, the disease progresses in a series of jumps; at times it is in remission, which means that a person's normal functions return for a period of time before the system goes into relapse and the disease again becomes more active. This is the most common form of MS; 80-90% of people have this form of the disease when they are first diagnosed. The relapse-remission cycle can continue for many years. Eventually, however, loss of physical and cognitive functions starts to take place and the remissions become less frequent.

**C.** In the primary progressive form of MS, there are no remissions and a continual but steady loss of physical and cognitive functions takes place. This condition affects about 10-15% of sufferers at diagnosis.

**D.** The expected course of the disease, or prognosis, depends on many variables: the subtype of the disease, the patient's individual characteristics and the initial symptoms. Life expectancy of patients, however, is often nearly the same as that of an unaffected person-provided that a reasonable standard of care is received. In some cases a nearnormal life span is possible.

**E.** The cause of the disease is unclear; it seems that some people have a genetic susceptibility, which is triggered by some unknown environmental factor. Onset of the disease usually occurs in young adults between the ages of 20 and 40. It is more common in women than men; however, it has also been diagnosed in young children and in elderly people.

**F.** Hereditary factors have been seen to have some relevance. Studies of identical twins have shown that if one twin has the disease, then it is likely that the other twin will develop it. In addition, it is important to realise that close relatives of patients have a higher chance of developing the disease than people without a relative who has MS.

**G.** Where people live can be seen to have a clear effect, as MS does not occur as frequently in every country. It commonly affects Caucasian people, particularly in North America, Europe and Australia. It has been recognised that MS is more common the further the country is away from the equator, and the incidence of MS is generally much higher in northern countries with temperate climates than in warmer southern countries.

**H.** Three things, which do not normally occur in healthy people, happen to people who have MS. First, tiny patches of inflammation occur in the brain or spinal chord. Second, the protective coating around the axons, or nerve fibres, in the body starts to deteriorate. Third, the axons themselves become damaged or destroyed. This can lead to a wide range of symptoms in the patient, depending on where the affected axons are located.

**I.** A common symptom of MS is blurred vision, caused by inflammation of the optic nerve. Another sign is loss of muscle tone in arms and legs; this is when control of muscle movement, or strength in the arms or legs, can be lost. Sense of touch can be lost, so that the body is unable to feel heat or cold, or the

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sufferer experiences temperature inappropriately, that is, feeling heat when it is cold and vice versa. Balance can also be affected; some people may eventually have to resort to a wheel-chair, either on a permanent or temporary basis. The course of the disease varies from person to person.

**J.** A diagnosis of MS is often confirmed by the use of a Magnetic Resonance Imaging (MRI) scan, which can show defects in the brain and spinal chord. Once diagnosed, MS is a lifelong disease; no cure exists, although a number of medical treatments have been shown to reduce relapses and slow the progression of the disease. It is important that patients with the disease are diagnosed early, so that treatment, which can slow the disease, can be started early.

## Questions 1-7

Complete the table below.

Choose **NO MORE THAN THREE WORDS** from the passage for each answer.

Main types of Q1. _____		
Q2. _____ 80-90% of sufferers	Primary Progressive Form Q3. _____ of patients	
Q4. _____ people are more often affected than other races. There is a higher incidence where the weather is Q5. _____	<b>Heredity</b> If one Q6. _____ is affected the other is likely to develop MS.	
<b>Three effects of MS</b>		
Inflammation in the brain and / or Q7. _____	Coating of nerve fibres damaged	Axons themselves damaged



## TEST 6 – Affordable Art

Art prices have fallen drastically. The art market is being flooded with good material, much of it from big-name artists, including Pablo Picasso and Andy Warhol. Many pieces sell for less than you might expect, with items that would have made £20,000 two years ago fetching only £5,000 to £10,000 this autumn, according to Philip Hoffman, chief executive of the Fine Art Fund. Here, we round up what is looking cheap now, with a focus on works in the range of £500 to £10,000.

Picasso is one of the most iconic names in art, yet some of his ceramics and lithographs fetched less than £1,000 each at Bonhams on Thursday. The low prices are because he produced so many of them. However, their value has increased steadily and his works will only become scarcer as examples are lost.

Nic McElhatton, the chairman of Christie's South Kensington, says that the biggest 'affordable' category for top artists is 'multiples' - prints such as screenprints or lithographs in limited editions. In a Christie's sale this month, examples by Picasso, Matisse, Miro and Steinlen sold for less than £5,000 each.

Alexandra Gill, the head of prints at the auction house, says that some prints are heavily hand-worked, or often coloured, by the artist, making them personalised. 'Howard Hodgkin's are a good example,' she says. 'There's still prejudice against prints, but for the artist it was another, equal, medium.'

Mr. Hoffman believes that these types of works are currently about as 'cheap as they can get' and will hold their value in the long run - though he admits that their sheer number means prices are unlikely to rise any time soon.

It can be smarter to buy really good one-offs from lesser-known artists, he adds. A limited budget will not run to the blockbuster names you can obtain with multiples, but it will buy you work by Royal Academicians [RAs] and others whose pieces are held in national collections and who are given long write-ups in the art history books. For example, the Christie's sale of art from the Lehman Brothers collection on Wednesday will include Valley with cornflowers in oil by Anthony Gross [22 of whose works are held by the Tate], at £1,000 to £1,500. There is no reserve on items with estimates of £1,000 or less, and William Porter, who is in charge of the sale, expects some lots to go for 'very little'. The sale also has oils by the popular Mary Fedden [whose works are often reproduced on greetings cards], including Spanish House and The White Hyacinth, at £7,000 to £10,000 each.

Large works by important Victorian painters are available in this sort of price range, too. These are affordable because their style has come to be considered 'uncool', but they please a large traditionalist following nonetheless. For example, the sale of 19th-century paintings at Bonhams on Wednesday has a Hampstead landscape by Frederick William Watts at £6,000 to £8,000 and a study of three Spanish girls by John Bagnold Burgess at £4,000 to £6,000. There are proto-social realist works depicting poverty, too, such as *Uncared For* by Augustus Edwin Mulready, at £10,000 to £15,000.

Smaller auction houses offer a mix of periods and media. Tuesday's sale at Chiswick Auctions in West London includes a 1968 screenprint of Campbells Tomato Soup by Andy Warhol, at £6,000 to £8,000, and 44 sketches by Augustus John, at £200 to £800 each. The latter have been restored after the artist tore them up. Meanwhile, the paintings and furniture sale at Duke's of Dorchester on Thursday has a coloured block print of Acrobats at Play by Marc Chagall, at £100 to £200, and a lithograph of a mother and child by Henry Moore, at £500 to £700. A group of five water colour landscape studies by Jean-Baptiste Camille Corot is up at £1,500 to £3,000.

Affordable works from lesser-known artists and younger markets are less safe, but they have the potential to offer greater rewards if you catch an emerging trend. Speculating on such trends is high-risk, so is worthwhile only if you like what you buy [you get something beautiful to keep, whatever happens], can afford to lose the capital and enjoy the necessary research.

A trend could be based on a country or region. China has rocketed, but other Asian and Middle Eastern markets have yet to really emerge. Mr. Horwich mentions some 1970s Iraqi paintings that he sold this year in Dubai. 'They are part of a sophisticated scene that remains little-known.' Mr. Hoffman tips Turkey and the Middle East. Meanwhile, the Sotheby's Impressionist and modern art sale in New York

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features a 1962 oil by the Vietnamese Vu Cao Dam, a graduate of Hanoi's Ecole des Beaux Arts de l'Indochine and friend of Chagall, at \$8,000 to \$12,000 (£5,088 to £7,632]. The painting shows two girls boating in traditional *ao dai* dresses.

A further way of making money is to try to spot talent in younger artists. The annual Frieze Art Fair in Regent's Park provides a chance to buy from 170 contemporary galleries. Or you could gamble on the future fame trajectory of an established artist's subject. For example, a Gerald Laing screenprint of The Kiss [2007] showing Amy Winehouse and her ex-husband is up for £4,700 at the Multiplied fair.

### Questions 1-5

Complete the table below.

Choose **NO MORE THAN TWO WORDS** from the passage for each answer.

Example of artist	Name of work / Type of art form	Reason for low price
Q1. _____	Ceramics and lithographs	He produced many
Q2. _____	Valley with cornflowers	Q3. _____
John Bagnold Burgess Vu Cao Dam	A study of three Spanish girls Q5. _____	Q4. _____ Asian region (except China) is not popular at the moment

## TEST 7 - An Ordinary Miracle

*Bigger harvests, without pesticides or genetically modified Crops?  
Farmers can make it happen by letting weeds do the work.*

Across East Africa, thousands of farmers are planting weeds in their maize fields. Bizarre as it sounds, their technique is actually raising yields by giving the insect pests something else to chew on besides maize. "It's better than pesticides, and a lot cheaper," said Ziad Khan, whose idea it is, as he showed me round his demonstration plots at the Mbita Point research station on the shores of Lake Victoria in Kenya. "And it has raised farm yields round here by 60 to 70 per cent."

His novel way of fighting pests is one of a host of low-tech innovations boosting production by 100 per cent or more on millions of poor Third World farms in the past decade. This "sustainable agriculture" just happens to be the biggest movement in Third World farming today dwarfing the tentative forays into genetic manipulation.

In East Africa, maize fields face two major pests, and Khan has a solution to both. The first is an insect called the stem borer, whose larvae eat their way through a third of the region's maize most years. But Khan discovered that the borer is even fonder of a local weed, napier grass. By planting napier grass in their fields, farmers can lure the stem borer away from the maize and into a honey trap. For the grass produces a sticky substance that traps and kills stem borer larvae. The second pest is Striga, a parasitic plant that wrecks \$10 billion worth of maize crops every year, threatening the livelihoods of 100 million Africans. "Weeding Striga is one of the most time-consuming activities for millions of African women farmers," says Khan. But he has an antidote: another weed called Desmodium. "It seems to release another sort of chemical that Striga doesn't like. At any rate, where farmers plant Desmodium between rows of maize, Striga won't grow."

"The success of sustainable agriculture is dispelling the myth that modern techno-farming is the most productive method," says Miguel Altieri of the University of California, Berkeley. "In Mexico, it takes 1.73 hectares of land planted with maize to produce as much food as one hectare planted with a mixture of maize, squash and beans. The difference," he says, "comes from the reduction of losses due to weeds, insects and diseases and a more efficient use of the available resources of water, light and nutrients. Monocultures breed pests and waste resources," he says.

Researchers from the Association Tefy Saina, a Madagascan group working for local farmers, were looking for ways to boost rice yields on small farms. They decided to make the best use of existing strains rather than track down a new breed of super-rice. Through trial and error, a new system was developed that raises typical rice yields from three to twelve tonnes per hectare. The trick is to transplant seedlings earlier and in smaller numbers so that more survive; to keep paddles unflooded for much of the growing period; and to help the plants grow using compost rather than chemical fertilisers. The idea has grown like wildfire, and 20,000 have adopted the idea in Madagascar alone.

Few countries have switched wholesale to sustainable agriculture. But Cuba has. The collapse of the Soviet Union in 1990 cut off cheap supplies of grain, tractors and agrochemicals. Pesticide use halved overnight, as did the calorie intake of its citizens. The cash-strapped country was forced to embrace Low-input farming or starve. "Today," says Fernando Funes of the Country's Pasture and Fodder Research institute, "teams of oxen replace the tractors, and farmers have adopted organic methods, mixing maize with beans and cassava and doubling yields in the process, helping average calorie intake per person rise back to pre-1990 levels."

Worldwide, one of the most widely adopted sustainable techniques has been to throw away the plough, the ultimate symbol of the farmer. Ploughing aerates the soil, helping rot weeds and crop residues. But it can also damage soil fertility and increase erosion. Now millions of Latin American farmers have decided it isn't worth the effort. A third of Argentina's farms no longer use the plough. Instead, they fight weeds by planting winter crops, such as black oats, or by spraying a biodegradable herbicide such as glyphosate. The farmers saw results in a short time - reduced costs, richer soils, bigger grain yields and

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increased income, says Lauro Bassi of EPAGRI, the agricultural research institute in Santa Catarina state, southern Brazil, which has been promoting the idea.

Zero-tillage also benefits the planet in general. Unploughed soils hang on to carbon that would otherwise escape into the air as carbon dioxide when organic matter rots. "A one-hectare field left unploughed can absorb up to a tonne of carbon every year," says Pretty, "making soils a vital element in preventing global warming."

Sustainable agriculture is no magic bullet for feeding the world. It is an approach rather than a blueprint. Small farms with low yields stand to gain the most and agribusiness the least. But it does offer an alternative for the millions of small farms that have plenty of hands to work the land, but not the skills or financial resources to adopt conventional mechanised farming.

## Questions 1-8

Complete the table below.

Choose **NO MORE THAN THREE WORDS** from the passage for each answer.

Area	Strategy	Benefits to farmers
East Africa	Q1. _____ with food crop	Lower costs Higher yields
Q2. _____	Growing mixed crops together	Higher yields
Madagascar	Transplanting seedlings earlier. Leaving paddy fields unflooded. Replacing chemical fertilisers with Q3. _____	Higher yields
Cuba	Reducing Q4. _____ Using Q5. _____ instead of farm vehicles.	Yields doubled Citizens' Q6. _____ increased
Latin America	Zero-tillage	Lower costs Improved Q7. _____ Higher yields Higher Q8. _____

## TEST 8 – The Romantic Poets

One of the most evocative eras in the history of poetry most surely be that of the Romantic Movement. During the late eighteenth and early nineteenth centuries a group of poets created it new mood in literary casting off their predecessors' styles in favour of a gripping and forceful art which endures with us to this day.

Five poets emerged as the main constituents of this movement - William Wordsworth, Samuel Taylor Coleridge, George Gordon Byron, Percy Bysshe Shelley and John Keats. The strength of their works lies undoubtedly In the power of their imagination. Indeed, imagination was the most critical attribute of the Romantic poets. Each poet had the ability to portray remarkable images and visions, although differing to a certain degree in their intensity and presentation. Nature, mythology and emotion were of great importance and were used to explore the feelings of the poet himself.

The lives of the poets often overlapped and tragedy was typical in most of them. Byron was born in London in 1788. The family moved to Aberdeen soon after, where Byron was brought up until he inherited the family seat of Newstead Abbey in Nottinghamshire from his great uncle. He graduated from Cambridge University in 1808 and left England the following year to embark on a tour of the Mediterranean. During this tour he developed a passion for Greece which would later lead to his death in 1824. He left for Switzerland in 1816 where he was introduced to Shelley.

Shelley was born to a wealthy family in 1792. He was educated at Eton and then went on to Oxford. Shelley was not happy in England, where his colourful lifestyle and unorthodox beliefs made him unpopular with the establishment. In 1818 he left for Italy, where he was reunited with Byron. However, the friendship was tragically brought to an end in July 1812, when Shelley was drowned in & boating accident off the Italian coast. In somewhat dramatic form, Shelley's body was cremated on the beach, witnessed by a small group of friends, including Byron.

Historically, Shelley and Byron are considered to have been the most outspoken and radical of the Romantic poets. By contrast, Wordsworth appears to have been of a pleasant and acceptable personality, even receiving the status of Poet laureate in 1843. He was born in 1770 in Cockermouth, Cumbria. By the time he entered his early teens, both his parents had died. As he grew older, Wordsworth developed a passion for writing.

In 1798 Wordsworth published a collection of poems with Coleridge, whom he had met, a few years earlier, when he settled in Somerset with his sister Dorothy. He married in 1802 and as time passed he deserted his former political views and became increasingly acceptable to popular society. Indeed, at the time of his death in the spring of 1850, he had become one of the most sought-after poets of his time. Wordsworth shared some of the years at DOVE Cottage in Somerset with his friend and poetical contemporary, Coleridge. Coleridge was born in Devon in 1772. He was a bright young scholar but never achieved the same prolific output of his fellow Romantic poets. In 1804 he left for a position in Malta for three years. On his return he separated from his wife and went to live with the Wordsworths, where he produced a regular periodical.

With failing health he later moved to London. In 1816 he went to stay with a doctor and his family. He remained with them until his death in 1834. During the latter years, his poetry was abandoned for other forms of writing equally outstanding in their own right. Perhaps the most tragic of the Romantic poets was Keats. Keats was born in London in 1195. Similar to Wordsworth, both his parents had died by his early teens. He studied as a surgeon, qualifying in 1816. However poetry was his great passion and he decided to devote himself to writing. For much of his adult life Keats was in poor health and fell gravely ill in early 1820. He knew he was dying and in the September of that year he left for Rome hoping that the more agreeable climate might ease his suffering. Keats died of consumption in February 1821 at the age of twenty five.

It is sad that such tragedy often accompanies those of outstanding artistic genius. We can only wonder at the possible outcome had they all lived to an old age. Perhaps even Byron and Shelley would have



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mellowed with the years, like Wordsworth. However, the contribution to poetry by all five writers is immeasurable. They introduced the concepts of individualism and imagination, allowing us to explore our own visions of beauty without retribution. We are not now required to restrain our thoughts and poetry to that of the socially acceptable.

### Questions 1-7

Complete the table below.

Choose **NO MORE THAN THREE WORDS** from the passage for each answer.

	Date of Birth	Education	
Byron	1788	Cambridge University	went on a journey around Q1. _____ came to love Q2. _____
Shelley	1792	Eton and Oxford University	some people disapproved of Q3. _____ and the beliefs he held
Wordsmith	1770		became more accepted when he changed his Q4. _____
Coleridge	1772	Bright scholar	his Q5. _____ was smaller than other Romantic poets' left the Wordsworth due to Q6. _____
Keats	1795	Qualified as a surgeon	left England for a change of Q7. _____

## TEST 9 - Is Technology Harming our Children's Health?

Technology is moving at such a breakneck speed that it is enough to make your head spin. It can be difficult to keep up. However, with each new technological marvel come consequences. Much of the research conducted has shown the extent of the damage being done to our hearth by technology. It is a scary thought, and with teenagers and children being heavy consumers and users of these gadgets, they run the risk of being harmed the most.

The digital revolution in music has enabled people to download, store and listen to songs on a tiny portable device called an MP3 player. The process is quick and afterwards you can have access to a library of thousands of songs that can fit into your palm. But experts say that continuously listening to loud music on these small music players can permanently damage hair cells in the inner ear resulting in hearing loss. For instance, old-fashioned headphones have been replaced with smaller ones that fit neatly into the ear; instead of over them, which intensifies the sound. In addition to that, digital music does not distort and keeps its crystal clear sound even on loud settings which encourages children to crank up the volume. Combine that with the fact that many children will spend hours listening to their iPods and you have the recipe for hearing loss.

Put into further perspective, most MP3 players can reach levels of 120 decibels, which is louder than a chainsaw or lawnmower. When you consider 85 decibels is the maximum safe decibel level set by treating experts over the course of a working day and that children will listen to music at higher decibel levels than that for long periods of time, hearing will invariably suffer.

Apart from hearing damage, there are other serious health risks. We are living in a wireless age. Calls can be made and received on mobiles from anywhere and the internet can be accessed without the need for cables. The advantages are enormous bringing ease and convenience to our lives. It is clear that mobiles and wireless technology are here to stay but are we paying the price for new technology? Studies have shown that the rapid expansion in the use of wireless technology has brought with it a new form of radiation called 'electro-pollution'.

Compared to two generations ago, we are exposed to 100 million times more radiation. The human body consists of trillions of cells which use faint electromagnetic signals to communicate with each other so that the necessary biological and physiological changes can happen. It is a delicate, natural balance. But this balance is being upset by the constant exposure to electromagnetic radiation (EMR) that we face in our daily lives and it is playing havoc with our bodies. EMR can disrupt and alter the way in which our cells communicate and this can result in abnormal cell behaviour. Some studies have shown that exposure to wireless technology can affect our enzyme production, immune systems, nervous system and even our moods and behaviour. The most dangerous part of the phone is around the antenna. This area emits extremely potent radiation which has been shown to cause genetic damage and an increase in the risk of cancer.

Research shows that teenagers and young adults are the largest group of mobile phone users. According to a recent *Eurobarometer* survey, 30 per cent of Europeans aged 12-13 own a mobile phone and the number of children five to nine years old owning mobiles has greatly increased over the years. Children are especially vulnerable because their brains and nervous systems are not as immune to attack as adults. Sir William Stewart, chairman of the National Radiological Protection Board, says there is mounting evidence to prove the harmful effects of wireless technologies and that families should monitor their children's use of them.

Besides the physical and biological damage, technology can also have serious mental implications for children. It can be the cause of severe addictive behaviour. In one case, two children had to be admitted into a mental health clinic in Northern Spain because of their addiction to mobile phones. An average of six hours a day would be spent talking, texting and playing games on their phones. The children could not be separated from their phones and showed disturbed behaviour that was making them fail at school. They

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regularly deceived family members to obtain money to buy phone cards to fund their destructive habit. There have been other cases of phone addiction like this.

Technology may also be changing our brain patterns. Professor Greenfield, a top specialist in brain development, says that, thanks to technology, teenage minds are developing differently from those of previous generations. Her main concern is over computer games. She claims that living in a virtual world where actions are rewarded without needing to think about the moral implications makes young people lose awareness of who they are. She claims that technology brings a decline in linguistic creativity.

As technology keeps moving at a rapid pace and everyone clamours for the new must-have gadget of the moment, we cannot easily perceive the long-term effects on our health. Unfortunately, it is the most vulnerable members of our society that will be affected.

## Questions 1-5

*Complete the table below.*

*Choose **NO MORE THAN TWO WORDS AND / OR A NUMBER** from the passage for each answer.*

	<b>MP3 player features</b>	<b>Harmful results</b>	<b>Effects</b>
Problem A	new Q1. _____ fit inside ears	creates intense sound	Damage to her cells and loss of hearing
Problem B	Q2. _____ is distortion-free with clear quality sound	invites children to increase Q3. _____	
Problem C	capable of producing sound at Q4. _____	as loud as a lawnmower or chainsaw- over recommended safe Q5. _____	

## TEST 10 - Seaweed for Human Consumption

Seaweeds are algae that live in the sea or in brackish water. Scientists often call them 'benthic marine algae', which just means 'attached algae that live in the sea'. Seaweeds come in three basic colours: red, green, and brown: dulse is the red seaweed; sea lettuce is amongst the green algae; and the brown is a wrack. Red and brown algae are almost exclusively marine, whilst green algae are also common in freshwater and in terrestrial situations. Many of these algae are very ancient organisms, and although lumped together as 'algae' are not actually closely related, having representatives in four of the five kingdoms of organisms. There are about 10,500 species of seaweeds, of which 6,500 are red algae (Rhodophyta).

The trend today is to refer to marine algae used as food as 'sea-vegetables'. The main species used in Ireland at present are dulse, carrageen moss, and various kelps and wracks. Dulse also known as dillisk in a number of areas - is a red alga that is eaten on both sides of the North Atlantic. Generally only eaten in Ireland after it has been dried, it is frequently sold in small packets, most commonly in the west and north. About 16 tonnes are used in Ireland at present; the species is also eaten in Canada, Iceland, Norway, France and Scotland. About 53 tonnes of carrageen moss were gathered in Ireland in 1994.

Whilst dulse and carrageen moss are worthy sea-vegetables with a history of utilisation and a small but proven market, other species also show considerable promise. Our kelp resources are considerably under-utilised. All of the kelp species are edible but *Laminaria saccharina* is probably the most palatable as it has a somewhat sweet taste, probably due to its high levels of mannitol, and it also cooks better.

Two other brown algae with potential as food are currently under investigation by us: *Himanthalia elongata*, known in some places as thongweed, and *Alaria esculenta*, also known as dabberlocks or murlins. *Himanthalia* is eaten in France after drying or pickling ('Spaghettis demer'), and plants are sold in Ireland dried. After soaking in water it makes a surprisingly fine accompaniment to a mixed salad; it does not have the strong seaweedy taste that some dislike. With the aid of a basic research grant from Forbairt, the Irish research and development body, we are examining the growth and life cycle of populations of this species on the west coast. Plants are easy to collect but must be dried quickly and packaged well to preserve their excellent taste and mouth feel.

*Alaria* is a large, kelp-like brown alga that grows on exposed shores; In Ireland, plants grow to considerable sizes, being found up to 6m in length in some areas, but these are dwarfed by some Pacific species that may grow to 18m in length and to 2m in width. With Marine Research Measure funding, a study of the possibility of developing fast-growing hybrids of this species by crossing species from the Atlantic and Pacific is being carried out. We have growing in culture isolates of *A. esculenta* from Ireland, Scotland, France, Norway, and Atlantic Canada and other species from British Columbia and Japan. Species of this genus are ideal for cross-breeding studies as the males and females are tiny filamentous plants that are relatively easy to grow and propagate in culture under red light which stimulates reproduction in our growth rooms. Male and female reproductive structures occur on different plants so that we can put plants from one country in with those from another to see if they are sexually compatible.

To date, we have obtained interesting results with *A. praelonga*, a large species from Japan that co-operates sexually with *A. esculenta* from the Aran Islands and other Irish sites. The resulting Irish/Japanese progeny are grown initially in sample bottles agitated on a small shaker and their growth rates compared with plants that have resulted from self-crosses. Preliminary results are very encouraging, with hybrid plants showing relatively high growth rates. We hope by this method to obtain sterile hybrids that will not reproduce in the wild so that we can introduce foreign genetic material without the fear that some sort of a tyffid will be introduced that will take over the west coast of Ireland.

While studies of these two food species are very promising, we must bear in mind that the market for such sea-vegetables is very small and needs development and investment. Nutritionally, seaweatables

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are as good as any land-vegetable and are superior in their vitamin, trace element and even protein content. The increase in catholic food tastes in Europe should see greater utilization of sea-vegetables in the next 20 years.

### Questions 1-4

Complete the table below.

Choose **NO MORE THAN THREE WORDS** from the passage for each answer.

Types of brown algae	Himantalia elongata	Alaria esculenta
Potential	food	food
Common name	thongweed	dabberlocks or Q1. _____
Research funded	with a Q2. _____ from Forbait	by Marine Research Measure
Purpose	to examine growth and life cycle populations	creation of fast-growing Q3. _____
Advantage		just right for Q4. _____



## LIST SELECTION

### Mini warm-up practice test – Select from the list

#### William Gilbert and Magnetism

A

The 16th and 17th centuries saw two great pioneers of modern science: Galileo and Gilbert. The impact of their findings is eminent. Gilbert was the first modern scientist, also the accredited father of the science of electricity and magnetism, an Englishman of learning and a physician at the court of Elizabeth. Prior to him, all that was known of electricity and magnetism was what the ancients knew, nothing more than that the lodestone possessed magnetic properties and that amber and jet, when rubbed, would attract bits of paper or other substances of small specific gravity. However, he is less well known than he deserves.

B

Gilbert's birth pre-dated Galileo. Born in an eminent local family in Colchester County in the UK, on May 24, 1544, he went to grammar school, and then studied medicine at St John's College, Cambridge, graduating in 1573. Later he travelled in the continent and eventually settled down in London.

C

He was a very successful and eminent doctor. All this culminated in his election to the president of the Royal Science Society. He was also appointed personal physician to the Queen (Elizabeth I), and later knighted by the Queen. He faithfully served her until her death. However, he didn't outlive the Queen for long and died on November 30, 1603, only a few months after his appointment as personal physician to King James.

D

Gilbert was first interested in chemistry but later changed his focus due to the large portion of mysticism of alchemy involved (such as the transmutation of metal). He gradually developed his interest in physics after the great minds of the ancient, particularly about the knowledge the ancient Greeks had about lodestones, strange minerals with the power to attract iron. In the meantime, Britain became a major seafaring nation in 1588 when the Spanish Armada was defeated, opening the way to British settlement of America. British ships depended on the magnetic compass, yet no one understood why it worked. Did the Pole Star attract it, as Columbus once speculated; or was there a magnetic mountain at the pole, as described in Odyssey, which ships would never approach, because the sailors thought its pull would yank out all their iron nails and fittings? For nearly 20 years, William Gilbert conducted ingenious experiments to understand magnetism. His works include *On the Magnet*, *Magnetic Bodies*, and *the Great Magnet of the Earth*.

E

Gilbert's discovery was so important to modern physics. He investigated the nature of magnetism and electricity. He even coined the word "electric". Though the early beliefs of magnetism were also largely entangled with superstitions such as that rubbing garlic on lodestone can neutralise its magnetism, one example being that sailors even believed the smell of garlic would even interfere with the action of compass, which is why helmsmen were forbidden to eat it near a ship's compass. Gilbert also found that metals can be magnetised by rubbing materials such as fur, plastic or the like on them. He named the ends of a magnet "north pole" and "south pole". The magnetic poles can attract or repel, depending on polarity. In addition, however, ordinary iron is always attracted to a magnet. Though he started to study the relationship between

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magnetism and electricity, sadly he didn't complete it. His research of static electricity using amber and jet only demonstrated that objects with electrical charges can work like magnets attracting small pieces of paper and stuff. It is a French guy named du Fay that discovered that there are actually two electrical charges, positive and negative.

F	
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He also questioned the traditional astronomical beliefs. Though a Copernican, he didn't express in his quintessential beliefs whether the earth is at the centre of the universe or in orbit around the sun. However, he believed that stars are not equidistant from the earth but have their own earth-like planets orbiting around them. The earth itself is like a giant magnet, which is also why compasses always point north. They spin on an axis that is aligned with the earth's polarity. He even likened the polarity of the magnet to the polarity of the earth and built an entire magnetic philosophy on this analogy. In his explanation, magnetism is the soul of the earth. Thus a perfectly spherical lodestone, when aligned with the earth's poles, would wobble all by itself in 24 hours. Further, he also believed that the sun and other stars wobble just like the earth does around a crystal core, and speculated that the moon might also be a magnet caused to orbit by its magnetic attraction to the earth. This was perhaps the first proposal that a force might cause a heavenly orbit.

G	
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His research method was revolutionary in that he used experiments rather than pure logic and reasoning like the ancient Greek philosophers did. It was a new attitude towards scientific investigation. Until then, scientific experiments were not in fashion. It was because of this scientific attitude, together with his contribution to our knowledge of magnetism, that a unit of magneto motive force, also known as magnetic potential, was named Gilbert in his honour. His approach of careful observation and experimentation rather than the authoritative opinion or deductive philosophy of others had laid the very foundation for modern science.

### Questions 1-3

Choose **THREE** letters **A-F**.

Which **THREE** of the following are parts of Gilbert's discovery?

- A. Metal can be transformed into another.
- B. Garlic can remove magnetism.
- C. Metals can be magnetised.
- D. Stars are at different distances from the earth.
- E. The earth wobbles on its axis.
- F. There are two charges of electricity.

## TEST 1 – Coastal Archeology of Britain

**A.** The recognition of the wealth and diversity of England's coastal archaeology has been one of the most important developments of recent years. Some elements of this enormous resource have long been known. The so-called 'submerged forests' off the coasts of England, sometimes with clear evidence of the human activity, had attracted the interest of antiquarians since at least the eighteenth century, but serious and systematic attention has been given to the archaeological potential of the coast only since the early 1980s.

**B.** It is possible to trace a variety of causes for this concentration of effort and interest. In the 1980s and 1990s scientific research into climate change and its environmental impact spilled over into a much broader public debate as awareness of these issues grew; the prospect of rising sea levels over the next century, and their impact on current coastal environments, has been a particular focus for concern. At the same time archaeologists were beginning to recognize that the destruction caused by natural processes of coastal erosion and by human activity was having an increasing impact on the archaeological resource of the coast.

**C.** The dominant process affecting the physical form of England in the postglacial period has been rising in the altitude of sea level relative to the land, as the glaciers melted and the landmass readjusted. The encroachment of the sea, the loss of huge areas of land now under the North Sea and the English Channel, and especially the loss of the land bridge between England and France, which finally made Britain an island, must have been immensely significant factors in the lives of our prehistoric ancestors. Yet the way in which prehistoric communities adjusted to these environmental changes has seldom been a major theme in discussions of the period. One factor contributing to this has been that, although the rise in relative sea level is comparatively well documented, we know little about the constant reconfiguration of the coastline. This was affected by many processes, mostly quite, which have not yet been adequately researched. The detailed reconstruction of coastline histories and the changing environments available for human use will be an important theme for future research.

**D.** So great has been the rise in sea level and the consequent regression of the coast that much of the archaeological evidence now exposed in the coastal zone. Whether being eroded or exposed as a buried land surface, is derived from what was originally terrestrial occupation. Its current location in the coastal zone is the product of later unrelated processes, and it can tell us little about past adaptations to the sea. Estimates of its significance will need to be made in the context of other related evidence from dry land sites. Nevertheless, its physical environment means that preservation is often excellent, for example in the case of the Neolithic structure excavated at the Stumble in Essex.

**E.** In some cases these buried land surfaces do contain evidence for human exploitation of what was a coastal environment, and elsewhere along the modern coast there is similar evidence. Where the evidence does relate to past human exploitation of the resources and the opportunities offered by the sea and the coast, it is both diverse and as yet little understood. We are not yet in a position to make even preliminary estimates of answers to such fundamental questions as the extent to which the sea and the coast affected human life in the past, what percentage of the population at any time lived within reach of the sea, or whether human settlements in coastal environments showed a distinct character from those inland.

**F.** The most striking evidence for use of the sea is in the form of boats, yet we still have much to learn about their production and use. Most of the known wrecks around our coast are not unexpectedly of post-medieval date, and offer an unparalleled opportunity for research which has yet been little used. The prehistoric sewn-plank boats such as those from the Humber estuary and Dover all seem to belong to the second millennium BC; after this there is a gap in the record of a millennium, which cannot yet be explained before boats reappear, but it built using a very different technology. Boatbuilding must have been an extremely important activity around much of our coast, yet we know almost nothing about it. Boats were some of the most complex artefacts produced by pre-modern societies, and further research on their

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production and use make an important contribution to our understanding of past attitudes to technology and technological change.

**G.** Boats need landing places, yet here again our knowledge is very patchy. In many cases the natural shores and beaches would have sufficed, leaving little or no archaeological trace, but especially in later periods, many ports and harbors, as well as smaller facilities such as quays, wharves, and jetties, were built. Despite a growth of interest in the waterfront archaeology of some of our more important Roman and medieval towns, very little attention has been paid to the multitude of smaller landing places. Redevelopment of harbor sites and other development and natural pressures along the coast are subject these important locations to unprecedented threats, yet few surveys of such sites have been undertaken.

**H.** One of the most important revelations of recent research has been the extent of industrial activity along the coast. Fishing and salt production are among the better documented activities, but even here our knowledge is patchy. Many forms of fishing will leave little archaeological trace, and one of the surprises of recent survey has been the extent of past investment in facilities for procuring fish and shellfish. Elaborate wooden fish weirs, often of considerable extent and responsive to aerial photography in shallow water, have been identified in areas such as Essex and the Severn estuary. The production of salt, especially in the late Iron Age and early Roman periods, has been recognized for some time, especially in the Thames estuary and around the Solent and Poole Harbor, but the reasons for the decline of that industry and the nature of later coastal salt working are much less well understood. Other industries were also located along the coast, either because the raw materials outcropped there or for ease of working and transport: mineral resources such as sand, gravel, stone, coal, ironstone, and alum were all exploited. These industries are poorly documented, but their remains are sometimes extensive and striking.

**I.** Some appreciation of the variety and importance of the archaeological remains preserved in the coastal zone, albeit only in preliminary form, can thus be gained from recent work, but the complexity of the problem of managing that resource is also being realized. The problem arises not only from the scale and variety of the archaeological remains, but also from two other sources: the very varied natural and human threats to the resource, and the complex web of organizations with authority over, or interests in, the coastal zone. Human threats include the redevelopment of historic towns and old dockland areas, and the increased importance of the coast for the leisure and tourism industries, resulting in pressure for the increased provision of facilities such as marinas. The larger size of ferries has also caused an increase in the damage caused by their wash to fragile deposits in the intertidal zone. The most significant natural threat is the predicted rise in sea level over the next century especially in the south and east of England. Its impact on archaeology is not easy to predict, and though it is likely to be highly localized, it will be at a scale much larger than that of most archaeological sites. Thus protecting one site may simply result in transposing the threat to a point further along the coast. The management of the archaeological remains will have to be considered in a much longer time scale and a much wider geographical scale than is common in the case of dry land sites, and this will pose a serious challenge for archaeologists.

### Questions 1-3

Choose **THREE** letters **A-G**.

Which **THREE** of the following statements are mentioned in the passage?

- A.** How coastal archaeology was originally discovered.
- B.** It is difficult to understand how many people lived close to the sea.
- C.** How much the prehistoric communities understand the climate change.
- D.** Our knowledge of boat evidence is limited.
- E.** Some fishing ground was converted to ports.
- F.** Human development threatens the archaeological remains.
- G.** Coastal archaeology will become more important in the future.

## TEST 2 - Motivating Drives

Scientists have been researching the way to get employees motivated for many years. This research in a relational study which builds the fundamental and comprehensive model for study. This is especially true when the business goal is to turn unmotivated teams into productive ones. But their researchers have limitations. It is like studying the movements of car without taking out the engine.

Motivation is what drives people to succeed and plays a vital role in enhancing an organizational development. It is important to study the motivation of employees because it is related to the emotion and behavior of employees. Recent studies show there are four drives for motivation. They are the drive to acquire, the drive to bond, the drive to comprehend and the drive to defend.

**The Drive to Acquire.** The drive to acquire must be met to optimize the acquire aspect as well as the achievement element. Thus the way that outstanding performance is recognized, the type of perks that is provided to polish the career path. But sometimes a written letter of appreciation generates more motivation than a thousand dollar check, which can serve as the invisible power to boost business engagement. Successful organizations and leaders not only need to focus on the optimization of physical reward but also on moving other levers within the organization that can drive motivation.

**The Drive to Bond.** The drive to bond is also key to driving motivation. There are many kinds of bonds between people, like friendship, family. In company, employees also want to be an essential part of company. They want to belong to the company. Employees will be motivated if they find personal belonging to the company. In the meantime, the most commitment will be achieved by the employee on condition that the force of motivation within the employee affects the direction, intensity and persistence of decision and behavior in company.

**The Drive to Comprehend.** The drive to comprehend motivates many employees to higher performance. For years, it has been known that setting stretch goals can greatly impact performance. Organizations need to ensure that the various job roles provide employees with simulation that challenges them or allow them to grow. Employees don't want to do meaningless things or monotonous job. If the job didn't provide them with personal meaning and fulfillment, they will leave the company.

**The Drive to Defend.** The drive to defend is often the hardest lever to pull. This drive manifests itself as a quest to create and promote justice, fairness, and the ability to express ourselves freely. The organizational lever for this basic human motivator is resource allocation. This drive is also met through an employee feeling connection to a company. If their companies are merged with another, they will show worries.

Two studies have been done to find the relations between the four drives and motivation. The article based on two studies was finally published in Harvard Business Review. Most authors' arguments have laid emphasis on four-drive theory and actual investigations. Using the results of the surveys which executed with employees from Fortune 500 companies and other two global businesses (P company and H company), the article mentions about how independent drives influence employees' behavior and how organizational levers boost employee motivation.

The studies show that the drive to bond is most related to fulfilling commitment, while the drive to comprehend is most related to how much effort employees spend on works. The drive to acquire can be satisfied by a rewarding system which ties rewards to performances, and gives the best people opportunities for advancement. For drive to defend, a study on the merging of P company and H company shows that employees in former company show an unusual cooperating attitude.

The key to successfully motivate employees is to meet all drives. Each of these drives is important if we are to understand employee motivation. These four drives, while not necessarily the only human drives, are the ones that are central to unified understanding of modern human life.



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## Questions 1-3

Choose **THREE** letters A-F.

Which **THREE** of the following statements are true of study of drives?

- A. Employees will be motivated if they feel belonged to the company.
- B. If employees get an opportunity of training and development program, their motivation will be enhanced.
- C. If employees' working goals are complied with organizational objectives, their motivation will be reinforced.
- D. If employees' motivation in very low, companies should find a way to increase their salary as their first priority.
- E. If employees find their work lacking challenging, they will leave the company.
- F. Employees will worry if their company is sold.

## TEST 3 – Eco-Resort Management Practices

Ecotourism is often regarded as a form of nature-based tourism and has become an important alternative source of tourists. In addition to providing the traditional resort-leisure product, it has been argued that ecotourism resort management should have a particular focus on best-practice environmental management, an educational and interpretive component, and direct indirect contributions to the conservation of the natural and cultural environment (Ayala, 1996).

Conran Cove Island Resort is a large integrated ecotourism-based resort located south of Brisbane on the Gold Coast, Queensland, Australia. As the world's population becomes increasingly urbanised, the demand for tourist attractions which are environmentally friendly, serene and offer amenities of a unique nature has grown rapidly. Couran Cove Resort, which is one such tourist attractions, is located on South Stradbroke Island, occupying approximately 150 hectares of the island. South Stradbroke Island is separated from the mainland by the Broadwater, a stretch of sea's kilometres wide. More than a century ago, there was only one Stradbroke Island, and there were at least four Aboriginal tribes living and limiting on the island. Regrettably, most of the original island dwellers were eventually killed by diseases such as tuberculosis, smallpox and influenza by the end of the 19th century. The second ship wrecked on the island in 1894, and the subsequent destruction of the ship (the Cambus Wallace) because it contained dynamite, caused a large crater in the sand hills on Stradbroke Island. Eventually, the ocean broke through the weakened land form and Stradbroke became two islands. Conran Cove Island Resort is built on one of the world's few naturally occurring sand lands, which is home to a wide range of plant communities and one of the largest remaining remnants of the rare *Livistona* rainforest left on the Gold Coast. Many mangrove and rainforest areas, and Malaleuca Wetlands on South Stradbroke Island (and in Queensland), have been cleared, drained or filled for residential, industrial, agricultural or urban development in the first half of the 20th century. Farmers and graziers finally abandoned South Stradbroke Island in 1959 because the vegetation and the soil conditions there were not suitable for agricultural activities.

### SUSTAINABLE PRACTICES OF COUKAN COVE RESORT

Being located on an offshore island, the resort is only accessible by means of water transport. The resort provides hourly ferry service from the marina on the mainland to and from the island. Within the resort, transport modes include walking trails, bicycle tracks and the beach train. The reception area is the counter of the shop which has not changed for 8 years at least. The accommodation is an octagonal "Bure". These are large rooms that are clean but the equipment is tiled and in some cases just working. Our ceiling fan only worked on high speed for example. Beds are hard but clean. There is a television, a radio, an old air conditioner and a small fridge. These "Bures" are right on top of each other and night noises do carry, so be careful what you say and do. The only tiling is the mosquitoes, but if you forget to bring mosquito repellent they sell some oil on the island. As an ecotourism-based resort most of the planning and development of the attraction has been concentrated on the need to co-exist with the fragile natural environment of South Stradbroke Island to achieve sustainable development.

### WATER AND ENERGY MANAGEMENT

South Stradbroke Island has groundwater at the centre of the island, which has a maximum height of 3 metres above sea level. The water supply is recharged by rainfall and is commonly known as an unconfined freshwater aquifer. Couran Cove Island Resort obtains its water supply by tapping into this aquifer and extracting it via a bore system. Some of the problems which have threatened the island's freshwater supply include pollution, contamination and over-consumption. In order to minimise some of these problems, all laundry activities are carried out on the mainland. The resort considers washing

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machines as onerous to the island's freshwater supply, and that the detergents contain a high level of phosphates which are a major source of water pollution. The resort uses LPG-power generation rather than a diesel-powered plant for its energy supply, supplemented by wind turbine, which has reduced greenhouse emissions by 70% of diesel-equivalent generation methods. Excess heat recovered from the generator is used to heat the swimming pool. Hot water in the eco-cabins and for some of the resort's vehicles are solar-powered. Water efficient fittings are also installed in showers and toilets. However, not all the appliances used by the resort are energy efficient, such as refrigerators. Visitors who stay at the resort are encouraged to monitor their water and energy usage via the in-house television systems, and are rewarded with prizes (such as a free return trip to the resort) accordingly if their usage level is low.

### CONCLUDING REMARKS

We examined a case study of good management practice and a pro-active sustainable tourism stance of an eco-resort. In three years of operation, Couran Cove Island Resort has won 23 international and national awards, including the 2001 Australian Tourism Award in the 4-Star Accommodation category. The resort has embraced and has effectively implemented contemporary environmental management practices. It has been argued that the successful implementation of the principles of sustainability should promote long-term social, economic and environmental benefits, while ensuring and enhancing the prospects of continued viability for the tourism enterprise. Couran Cove Island Resort does not conform to the characteristics of the Resort Development Spectrum, as proposed by Pridcaux (2000). According to Pridcaux, the resort should be at least at Phase 3 of the model (the National tourism phase), which describes an integrated resort providing 3-4 star hotel type accommodation. The primary tourist market in Phase 3 of the model consists mainly of interstate visitors. However, the number of interstate and international tourists visiting the resort is small, with the principal visitor markets comprising locals and residents from nearby towns and the Gold Coast region. The carrying capacity of Couran Cove does not seem to be of any concern to the Resort management. Given that it is a private commercial ecotourist enterprise, regulating the number of visitors to the resort to minimise damage done to the natural environment on South Stradbroke Island is not a binding constraint. However, the Resort's growth will eventually be constrained by its carrying capacity, and quantity control should be incorporated in the management strategy of the resort.

### Questions 1-3

Choose **THREE** letters **A-E**.

Which **THREE** of the following statements are true as to the contemporary situation of Couran Cove Island Resort in the last paragraph?

- A. Couran Cove Island Resort goes for more eco-friendly practices.
- B. The accommodation standard only conforms to the Resort Development Spectrum of Phase 3.
- C. Couran Cove Island Resort should raise the accommodation standard and build more facilities.
- D. The principal group visiting the resort is international tourists.
- E. Its carrying capacity will restrict the future businesses' expansion.

## TEST 4 – Quantitative Research in Education

Many education researchers used to work on the assumption that children experience different phases of development, and that they cannot execute the most advanced level of cognitive operation until they have reached the most advanced forms of cognitive process. For example, one researcher Piaget had a well-known experiment in which he asked the children to compare the amount of liquid in containers with different shapes. Those containers had the same capacity, but even when the young children were demonstrated that the same amount of fluid could be poured between the containers, many of them still believed one was larger than the other. Piaget concluded that the children were incapable of performing the logical task in figuring out that the two containers were the same size even though they had different shapes, because their cognitive development had not reached the necessary phase. Critics on his work, such as Donaldson, have questioned this interpretation. They point out the possibility that the children were just unwilling to play the experimenter's game, or that they did not quite understand the question asked by the experimenter. These criticisms surely do state the facts, but more importantly, it suggests that experiments are social situations where interpersonal interactions take place. The implication here is that Piaget's investigation and his attempts to replicate it are not solely about measuring the children's capabilities of logical thinking, but also the degree to which they could understand the directions for them, their willingness to comply with these requirements, how well the experimenters did in communicating the requirements and in motivating those children, etc.

The same kinds of criticisms have been targeted to psychological and educational tests. For instance, Mehan argues that the subjects might interpret the test questions in a way different from that meant by the experimenter. In a language development test, researchers show children a picture of a medieval fortress, complete with moat, drawbridge, parapets and three initial consonants in it: D, C, and G. The children are required to circle the correct initial consonant for 'castle'. The answer is C, but many kids choose D. When asked what the name of the building was, the children responded 'Disneyland'. They adopted the reasoning line expected by the experimenter but got to the wrong substantive answer. The score sheet with the wrong answers does not include in it a child's lack of reasoning capacity; it only records that the children gave a different answer rather than the one the tester expected.

Here we are constantly getting questions about how valid the measures are where the findings of the quantitative research are usually based. Some scholars such as Donaldson consider these as technical issues, which can be resolved through more rigorous experimentation. In contrast, others like Mehan reckon that the problems are not merely with particular experiments or tests, but they might legitimately jeopardise the validity of all researches of this type.

Meanwhile, there are also questions regarding the assumption in the logic of quantitative educational research that causes can be identified through physical and/or statistical manipulation of the variables. Critics argue that this does not take into consideration the nature of human social life by assuming it to be made up of static, mechanical causal relationships, while in reality, it includes complicated procedures of interpretation and negotiation, which do not come with determinate results. From this perspective, it is not clear that we can understand the pattern and mechanism behind people's behaviours simply in terms of the casual relationships, which are the focuses of quantitative research. It is implied that social life is much more contextually variable and complex.

Such criticisms of quantitative educational research have also inspired more and more educational researchers to adopt qualitative methodologies during the last three or four decades. These researchers have steered away from measuring and manipulating variables experimentally or statistically. There are many forms of qualitative research, which is loosely illustrated by terms like 'ethnography', 'case study', 'participant observation', 'life history', 'unstructured interviewing', 'discourse analysis' and so on. Generally speaking, though, it has characteristics as follows:

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Qualitative researches have an intensive focus on exploring the nature of certain phenomena in the field of education, instead of setting out to test hypotheses about them. It also inclines to deal with 'unstructured data', which refers to the kind of data that have not been coded during the collection process regarding a closed set of analytical categories. As a result, when engaging in observation, qualitative researchers use audio or video devices to record what happens or write in detail open-ended field-notes, instead of coding behaviour concerning a pre-determined set of categories, which is what quantitative researchers typically would do when conducting 'systematic observation'. Similarly, in an interview, interviewers will ask open-ended questions instead of ones that require specific predefined answers of the kind typical, like in a postal questionnaire. Actually, qualitative interviews are often designed to resemble casual conversations.

The primary forms of data analysis include verbal description and explanations and involve explicit interpretations of both the meanings and functions of human behaviours. At most, quantification and statistical analysis only play a subordinate role. The sociology of education and evaluation studies were the two areas of educational research where criticism of quantitative research and the development of qualitative methodologies initially emerged in the most intense way. A series of studies conducted by Lacey, Hargreaves and Lambert in a boys' grammar school, a boys' secondary modern school, and a girls' grammar school in Britain in the 1960s marked the beginning of the trend towards qualitative research in the sociology of education. Researchers employed an ethnographic or participant observation approach, although they did also collect some quantitative data, for instance on friendship patterns among the students. These researchers observed lessons, interviewed both the teachers and the students, and made the most of school records. They studied the schools for a considerable amount of time and spent plenty of months gathering data and tracking changes over all these years.

### Questions 1-3

Choose **THREE** letters **A-F**.

Which **THREE** are mentioned by the writer of the passage?

- A. Coding behaviour in terms of a predefined set of categories
- B. Designing an interview as an easy conversation
- C. Working with well-organised data in a closed set of analytical categories
- D. Full of details instead of loads of data in questionnaires
- E. Asking to give open-ended answers in questionnaires
- F. Recording the researching situation and applying note-taking



## TEST 5 – Going Nowhere Fast

THIS is ludicrous! We can talk to people anywhere in the world or fly to meet them in a few hours. We can even send probes to other planets. But when it comes to getting around our cities, we depend on systems that have scarcely changed since the days of Gottlieb Daimler.

In recent years, the pollution belched out by millions of vehicles has dominated the debate about transport. The problem has even persuaded California that home of car culture - to curb traffic growth. But no matter how green they become, cars are unlikely to get us around crowded cities any faster. And persuading people to use trains and buses will always be an uphill struggle. Cars, after all, are popular for very good reasons, as anyone with small children or heavy shopping knows.

So politicians should be trying to lure people out of their cars, not forcing them out. There's certainly no shortage of alternatives. Perhaps the most attractive is the concept known as personal rapid transit (PRT), independently invented in the US and Europe in the 1950s.

The idea is to go to one of many stations and hop into a computer-controlled car, which can whisk you to your destination along a network of guideways. You wouldn't have to share your space with strangers, and with no traffic lights, pedestrians or parked cars to slow things down, PRT guideways can carry far more traffic, nonstop, than any inner city road.

It's a wonderful vision, but the odds are stacked against PRT for a number of reasons. The first cars ran on existing roads, and it was only after they became popular – and after governments started earning revenue from them-that a road network designed specifically for motor vehicles was built. With PRT, the infrastructure would have to come first-and that would cost megabucks. What's more, any transport system that threatened the car's dominance would be up against all those with a stake in maintaining the status quo, from private car owners to manufacturers and oil multinationals. Even if PRTs were spectacularly successful in trials, it might not make much difference. Superior technology doesn't always triumph, as the VHS versus Betamax and Windows versus Apple Mac battles showed.

But "dual-mode" systems might just succeed where PRT seems doomed to fail. The Danish RUF system envisaged by Palle Jensen, for example, resembles PRT but with one key difference: vehicles have wheels as well as a slot allowing them to travel on a monorail, so they can drive off the rail onto a normal road. Once on a road, the occupant would take over from the computer, and the RUF vehicle the term comes from a Danish saying meaning to "go fast" - would become an electric car.

Build a fast network of guideways in a busy city centre and people would have a strong incentive not just to use public RUF vehicles, but also to buy their own dual-mode vehicle. Commuters could drive onto the guideway, sit back and read as they are chauffeured into the city. At work, they would jump out, leaving their vehicles to park themselves. Unlike PRT, such a system could grow organically, as each network would serve a large area around it and people nearby could buy into it. And a dual-mode system might even win the support of car manufacturers, who could easily switch to producing dual-mode vehicles.

Of course, creating a new transport system will not be cheap or easy. But unlike adding a dedicated bus lane here or extending the underground railway there, an innovative system such as Jensen's could transform cities.

And it's not just a matter of saving a few minutes a day. According to the Red Cross, more than 30 million people have died in road accidents in the past century-three times the number killed in the First World War-and the annual death toll is rising. And what's more, the Red Cross believes road accidents will become the third biggest cause of death and disability by 2020, ahead of diseases such as AIDS and tuberculosis. Surely we can find a better way to get around?

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## Questions 1-3

Choose **THREE** letters A-G.

Which **THREE** of the following are advantages of the new transport system?

- A. economy
- B. space
- C. low pollution
- D. suitability for families
- E. speed
- F. safety
- G. suitability for children

## TEST 6 – Two Wings and a Toolkit

Betty and her mate Abel are captive crows in the care of Alex Kacelnik, an expert in animal behaviour in Oxford University. They belong to a forest-dwelling species of bird (*Corvus moneduloides*) confined to two islands in the South Pacific. New Caledonian crows are tenacious predators, and the only birds that habitually use a wide selection of self-made tools to find food.

One of the wild crow's cleverest tools is the crochet hook, (made by detaching a side twig from a larger one, leaving enough of the larger twig to shape into a hook. Equally cunning is a tool crafted from the barbed vine leaf, which consists of a central rib with paired leaflets each with a rose-like thorn at its base. They strip out a piece of this rib, removing the leaflets and all but one thorn at the top, which remains as a ready-made hook to prize out insects from awkward cracks.

The crows also make an ingenious tool called a padanus probe from padanus tree leaves. The tool has a broad base, sharp tip, a row of tiny hooks along one edge, and a tapered shape created by the crow nipping and tearing to form a progression of three or four steps along the other edge of the leaf. What makes this tool special is that they manufacture it to its standard design, as if following a set of instructions. Although it is rare to catch a crow in the act of clipping out a padanus probe, we do have ample proof of their workmanship: the discarded leaves from which the tools are cut. The remarkable thing that these 'counterpart' leaves tell us is that crows consistently produce the same design every time, with no in-between or trial versions. It's left the researchers wondering whether, like people, they envisage the tool before they start and perform the actions they know are needed to make it.

Research has revealed that genetics plays a part in the less sophisticated tool-making skills of finches in the Bushes in the Galapagos islands. No one knows if that's also the case for New Caledonian crows, but it's highly unlikely that their tool-making skills are hardwired into the brain. 'The picture so far points to a combination of cultural transmission from parent birds to their young and individual resourcefulness,' says Kacelnik.

In a test at Oxford, Kacelnik's team offered Betty and Abel an original challenge food in a bucket at the bottom of a well. The only way to get the food was to hook the bucket out by its handle. Given a choice of tools a straight length of wire and one with hooked end the birds immediately picked the hook showing that they did indeed understand the functional properties of the tool.

But do they also have the foresight and creativity to plan the construction of their tools? It appears they do. In one bucket-in-the-well test, Abel carried off the hook, leaving Betty with nothing but the straight wire. 'What happened next was absolutely amazing says Kacelnik. She wedged the tip of the wire into a crack in a plastic dish and pulled the other end to fashion her own hook. Wild crows don't have access to pliable, bendable material that retains its shape, and Betty's only similar experience was a brief encounter with some pipe cleaners a year earlier. In nine out of ten further tests, she again made hooks and retrieved the bucket.

The question of what's going on in a crow's mind will take time and a lot more experiments to answer, but there could lie a lesson in it for understanding our own evolution. Maybe our ancestors, who suddenly began to create symmetrical tools with carefully worked edges some 1.5 million years ago, didn't actually have the sophisticated mental abilities with which we credit them. Closer scrutiny of the brains of New Caledonian crows might provide a few pointers to the special attributes they would have needed. 'If we're lucky we may find specific developments in the brain that set these animals apart', says Kacelnik.

One of these might be a very strong degree of laterality the specialization of one side of the brain to perform specific tasks. In people, the left side of the brain controls the processing of complex sequential tasks, and also language and speech. One of the consequences of this is thought to be right-handedness. Interestingly, biologists have noticed that most padanus probes are cut from the left side of the leaf meaning that the birds clip them with the right side of their beaks the crow equivalent of right handedness. The team thinks this reflects the fact that the left side of the crow's brain is specialised to handle the sequential processing required to make complex tools. Under what conditions might this extraordinary talent have

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emerged in these two species? They are both social creatures, and wide-ranging in their feeding habits. These factors were probably important but, ironically, it may have been their shortcomings that triggered the evolution of tool-making. Maybe the ancestors of crows and humans found themselves in a position where they couldn't make the physical adaptations required for survival so they had to change their behaviour instead. The stage was then set for the evolution of those rare cognitive skills that produce sophisticated tools. New Caledonian crows may tell us what those crucial skills are.

### Questions 1-3

Choose **THREE** letters A-G.

Which **THREE** of the following features are probably common to both New Caledonian crows and human beings?

- A. Keeping the same mate for life.
- B. Having few natural predators.
- C. Having a bias to the right when working.
- D. Being able to process sequential tasks.
- E. Living in extended family groups.
- F. Eating a variety of foodstuffs.
- G. Being able to adapt to diverse habitats.

## TEST 7 - Amber - Frozen Moments in Time

Amber has a deep fascination both for ordinary people as a gem and for the scientist for whom it provides a glimpse into the past, a window into history. The majority of amber which has been discovered and studied originates in the Cenozoic Era. The earlier Mesozoic which consists of the Cretaceous, Jurassic and Triassic periods has also produced amber but in smaller and scarcer quantities due to its much older age. One of the problems associated with Mesozoic amber is the level of degradation it undergoes. Ancient fossil resin can be badly affected by oxidation, erosion, excessive heat and pressure.

Amber begins as resin exuded from trees millions of years ago possibly to protect themselves against fungal or insect attack or as a by-product of some form of growth process. Most known deposits of amber come from various tree species which are now extinct. Baltic amber was produced by a giant tree called *Pinites succinifer*, a tree sharing many characteristics of the currently living genus *Pseudolarix*. The true reason for this resin discharge from various species of trees is not fully understood. Scientists have theorised that it also could be a form of desiccation control, an aid to attract insect pollinators or even a reaction to storm or weather damage.

The resin from the trees needs to go through a number of stages in order to become amber. The first stage involves the slow cross chain linking of the molecular structure within the resin, a kind of polymerisation. This makes the resin hard but easily broken compared to its original state of being soft and plastic. Once it is in this state, the resin can be called copal. Following the polymerisation the next stage is the evaporation of volatile oils inside the copal. The oils, called turpenes, slowly permeate out of the amber. This second stage may take millions of years before the process turns the copal into something approaching the structure of amber. It is speculated that either one or both of these stages in the formation of amber must take place in an anaerobic environment or it may have to sustain a period of immersion in sea water. Amber which is exposed to air for several years undergoes oxidation which causes a distinct darkening and crusting of the gem's surface producing over many years tiny splinters and shards.

The chemical structure of amber is not consistent, not even within a single fragment, let alone a single deposit. Consequently numerous chemical formulas have been attributed to it. The reason for this wide variation is simply because amber is not a true mineral; it is an organic plastic with variable mixtures. Some aspects of amber are fairly consistent though.

On Moh's scale of hardness it lies between 2 and 2.5. It has a refraction index of 1.54 and a melting point between 150 - 180°C. The colour range is extremely varied, ranging from near white (osseous) through all shades of yellow, brown and red. There are even examples of blue and green amber. Blue - green amber is thought to have two possible causes: either the permeation of raw resin by mineral deposits present in the soil into which it fell, or the settling of volcanic dust and ash onto the resin when it was first secreted.

One of the most exciting and interesting aspects of amber are the inclusions, both flora and fauna, which are found within it. The most frequent inclusions to be found in amber, particularly Baltic, are examples of the order Diptera or true flies. These tiny flies would have lived on the fungus growing on the rotting vegetation of the amber forest of which no doubt there was enough to support an enormous population. Occasionally a small lizard will be found trapped and encased in amber, particularly from the Dominican Republic deposits. The American Natural History Museum has a famous example of a 25,000,000 year old gecko.

Another unusual find is the remains of a frog discovered in a piece mined in the Dominican Republic. At first it was thought to be just one animal with some tissue preserved. The 120 distinct shape of the frog can be seen but most of the flesh has deteriorated and several bones are exposed, some broken. Under closer scrutiny a count of the bones suggests that this particular frog must have had at least 6 legs. Palaeontologists speculate that a bird that ate the frogs may have had a feeding site, perhaps on a branch directly above an accumulating pool of resin; hence the numerous bones present. The complete frog was perhaps an unlucky drop by the bird when it alighted on the branch. Mammalian hair can also infrequently be found trapped as tufts or single strands. When found in the Baltic area, hair in amber is often attributed to sloths that lived



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within the ancient forest. Resin in the process of hardening usually develops a skin whilst the interior is still soft. Occasionally amber of this nature has impressions stamped on its surface and thus becomes a trace fossil. For instance the clear impression of a cat's paw has been found on a piece of amber found in the Baltic area.

The faking of inclusions in amber has been a major cottage industry since the earliest times. Gum is melted gently and suitable inclusions placed into the matrix; this is frequently some kind of colourful insect. Artificial colour is always a dead give away of a bogus amber fossil.

### Questions 1-3

Choose **THREE** letters **A-H**.

Which **THREE** of the following are NOT given as possible reasons for the production of the resin by tress which later forms amber?

- A. A defence system.
- B. Changes in the molecular structure of the tree.
- C. A development side-effect.
- D. An effect of the Baltic weather.
- E. A way of dealing with water loss.
- F. The result of oxidization.
- G. Part of the reproduction process.
- H. A result of damage.

## TEST 8 – Unlikely Boomtowns: The World's Hottest Cities

Megacities like London, New York and Tokyo loom large in our imaginations. They are still associated with fortune, fame and the future. They can dominate national economies and politics. The last fifty years has been their era, as the number of cities with more than ten million people grew from two to twenty. But with all respect to the science fiction novelists who have envisioned a future of urban giants, their day is over. The typical growth rate of the population within a megacity has slowed from more than eight percent in the 1980s to less than half that over the last five years, and numbers are expected to be static in the next quarter century. Instead, the coming years will belong to a smaller, more humbler relation - the Second City.

Within a few years, more people will live in cities than in the countryside for the first time in human history. But increasingly, the urban core itself is downsizing. Already, half the city dwellers in the world live in metropolises with fewer than half-a-million residents. Second Cities from exurbs, residential areas outside the suburbs of a town, to regional centres are booming. Between 2000 and 2015, the world's smallest cities (with under 500,000 people) will grow by 23 per cent, while the next smallest (One million to five million people) will grow by 27 per cent. This trend is the result of dramatic shifts including the global real estate bubble; increasing international migration; cheaper transport; new technologies, and the fact that the baby-boom generation is reaching retirement age.

The emergence of Second Cities has flowed naturally (if unexpectedly) from the earlier success of the megacities. In the 1990s, megacities boomed as global markets did. This was particularly true in areas with high tech or 'knowledge based' industries like finance. Bonuses got bigger, bankers got richer and real estate prices in the world's most sought-after cities soared. The result has been the creation of what demographer William Frey of the Washington based Brookings Institute calls 'gated regions' in which both the city and many of the surrounding suburbs have become unaffordable for all but the very wealthy. Economically, after a city reaches a certain size its productivity starts to fall,' notes Mario Pezzini, head of the regional competitiveness division of the OECD. He puts the tipping point at about six million people, after which costs, travel times and the occasional chaos create in which the centre of the city may be a great place, but only for the rich, and the outlying areas become harder to live and work in.

One reaction to this phenomenon is further sprawl high prices in the urban core and traditional suburbs drive people to distant exurbs with extreme commutes into big cities. As Frey notes, in the major US metropolitan areas, average commuting times have doubled over the last fifteen years.

Why does one town become a booming Second City, while another fails? The answer hinges on whether a community has the wherewithal to exploit the forces pushing people and businesses out of the megacities. One key is excellent transport links, especially to the biggest commercial centres. Though barely a decade old, Goyang is South Korea's fastest-growing city in part because it is 30 minutes by subway from Seoul.

Another growth driver for Second Cities is the decentralisation of work, driven in large part by new technologies. While more financial deals are done now in big capitals like New York and London than ever before, it is also clear that plenty of booming service industries are leaving for 'Rising Urban stars' like Dubai, Montpellier and Cape Town. These places have not only improved their Internet backbones but often have technical institutes and universities that turn out the kinds of talent that populate growth industries. Consider Montpellier, France, a case study in urban decentralisation. Until the 1980s, it was like a big Mediterranean village. Once the high speed train lines were built, Parisians began pouring in for weekend breaks. Some bought houses, creating a critical mass of middle-class professionals who began taking advantage of flexible working systems to do three days in Paris, and two down South, where things seemed less pressured. Soon big companies began looking at the area, a number of medical technology and electronic firms came to town, and IBM put more investment into service businesses there. To cater to the incoming professionals, the city began building amenities: an opera house, a tram line to discourage cars in

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the city centre. The result, says French urban-planning expert Nacima Baron, is that the city is now full of cosmopolitan business people. It's a new society'.

All this means that Second Cities won't stay small. Indeed countries are actively promoting their growth. Italy, for example, is trying to create tourist hubs of towns close to each other with distinctive buildings and offering different yet complementary cultural activities. Devolution of policy making power is leaving many lesser cities more free than ever to shape their destinies. To them all: This is your era. Don't blow it.

### Questions 1-3

Choose **THREE** letters A-G.

Which **THREE** of the following statements are true of megacities according to the text?

- A. They tend to lead the way in terms of fashion.
- B. Their population has ceased to expand.
- C. They reached their peak in the second half of the twentieth century.
- D. 50 per cent of the world's inhabitants now live in them,
- E. They grew rich on the profits from manufacturing industry.
- F. Their success begins to work against them at a certain stage.
- G. It is no longer automatically advantageous to base a company there.

## TEST 9 - Changing Rules for Health Treatment

People who are grossly overweight, who smoke heavily or drink excessively could be denied surgery or drugs. The National Institute for Health and Clinical Excellence (NICE), which advises on the clinical and cost effectiveness of treatments for the National Health Service (NHS) in the UK, said that in some cases the- 'self-inflicted' nature of an illness should be taken into account.

NICE stressed that people should not be discriminated against by doctors simply because they smoke or were overweight. Its ruling should apply only if the treatment was likely to be less effective, or not work because of an unhealthy habit. The agency also insisted that its decision was not an edict for the whole NHS but guidance for its own appraisal committees when reaching judgements on new drugs or procedures. But the effect is likely to be the same.

NICE is a powerful body and the cause of much controversy. It is seen by some as a new way of rationing NHS treatment. Across the UK, primary care trusts (PCTs) regularly wait for many months for a NICE decision before agreeing to fund a new treatment. One group of primary care trusts is ahead of NICE. Three PCTs in east Suffolk have already decided that obese people would not be entitled to have hip or knee replacements unless they lost weight. The group said the risks of operating on them were greater, the surgery may be less successful and the joints would wear out sooner. It was acknowledged that the decision would also save money.

NICE said no priority should be given to patients based on income, social class or social roles at different ages when considering the cost effectiveness of a treatment. Patients should not be discriminated against on the grounds of age either, unless age has a direct relevance to the condition. NICE has already ruled that IVF should be available on the NHS to women aged 23 to 39 as the treatment has less chance of success in older women. It also recommends that flu drugs should be available to over-65s, as older people are more vulnerable.

But NICE also said that if self-inflicted factors meant that drugs or treatment would be less clinically and cost effective, this may need to be considered when producing advice for the NHS. They state that 'if the self inflicted cause of the condition will influence the likely outcome of its particular treatment, then it may be appropriate to take this into account in some circumstances'. They acknowledge that it can be difficult to decide whether an illness such as a heart attack was self-inflicted in a smoker. 'A patient's individual circumstances may only be taken into account when there will be an impact on the clinical and cost effectiveness of the treatment.

Prof Sir Michael Rawlins, the chairman of NICE, said: 'On age we are very clear - our advisory groups should not make recommendations that depend on people's ages when they are considering the use of its particular treatment, unless there is clear evidence of a difference in its effectiveness for particular age groups. Even then, age should only be mentioned when it provides the only practical 'market of risk or benefit. NICE values people, equally, at all ages'.

But Steve Webb, the Liberal Democrat health spokesman, said there was a danger of primary care trusts following the same course of action. 'There is no excuse for cashstrapped hospitals denying treatment to people whose lifestyle they disapprove of, he said. 'Treatment decisions involving people's lifestyle should be based on clinical reasons, not grounds of cost. The NHS is there to keep people healthy, not to sit in judgement on individual lifestyles.

A spokesman for NICE said: 'We want to reassure people not in producing our guidance we are not going to take into consideration whether or not a particular condition was or is self-inflicted. The only circumstance where that may be taken into account is where that treatment may be less effective because of lifestyle choices'.

Jonathan Ellis, the policy manager at Help the Aged, said it was pleased NICE had finally shown an understanding of the importance of tackling age discrimination. 'White this is a major feat there is still some

## Welcome to Mr Aslanov's Lessons QUESTION-TYPE BASED TESTS

way to go to banish the evident inherent age discrimination that exists within health care services,' he said. 'The NHS now has much to learn. It will ensure it fairer deal all round for older people using the NHS.'

### Questions 1-3

Choose **THREE** letters **A-H**.

Which **THREE** of the following statements are true of NICE, according to the text?

- A. It feels that people with bad health habit should not receive treatment.
- B. It is an agency that offers advice to the NHS.
- C. Some of the reports they produce discriminate against the elderly.
- D. It insists its decision should only be applicable in certain situations.
- E. It is an agency that controls all NHS policy regarding treatments.
- F. Its powers are not as extensive as those of the NBS.
- G. Many PCTs base their decisions concerning funding on one made by NICE.
- H. It has made a statement that overweight people will not receive new joints.



## TEST 10 – The History of Salt

Salt is so simple and plentiful that we almost take it for granted. In chemical terms, salt is the combination of a sodium ion with a chloride ion, making it one of the most basic molecules on earth. It is also one of the most plentiful: it has been estimated that salt deposits under the state of Kansas alone could supply the entire world's needs for the next 250,000 years.

But salt is also an essential element. Without it, life itself would be impossible since the human body requires the mineral in order to function properly. The concentration of sodium ions in the blood is directly related to the regulation of safe body fluid levels. And while we are all familiar with its many uses in cooking, we may not be aware that this element is used in some 14,000 commercial applications. From manufacturing pulp and paper to setting dyes in textiles and fabric, from producing soaps and detergents to making our roads safe in winter, salt plays an essential part in our daily lives.

Salt has a long and influential role in world history. From the dawn of civilization, it has been a key factor in economic, religious, social and political development. In every corner of the world, it has been the subject of superstition, folklore, and warfare, and has even been used as currency.

As a precious and portable commodity, salt has long been a cornerstone of economies throughout history. In fact, researcher M.R. Bloch conjectured that civilization began along the edges of the desert because of the natural surface deposits of salt found there. Bloch also believed that the first war - likely fought near the ancient city of Essalt on the Jordan River - could have been fought over the city's precious supplies of the mineral.

In 2200 BC, the Chinese emperor Hsia Yu levied one of the first known taxes. He taxed salt. In Tibet, Marco Polo noted that tiny cakes of salt were pressed with images of the Grand Khan to be used as coins and to this day among the nomads of Ethiopia's Danakil Plains it is still used as money. Greek slave traders often bartered it for slaves, giving rise to the expression that someone was "not worth his salt." Roman legionnaires were paid in salt - a *salarium*, the Latin origin of the word "salary."

Merchants in 12th-century Timbuktu - the gateway to the Sahara Desert and the seat of scholars - valued this mineral as highly as books and gold. In France, Charles of Anjou levied the "gabelle," a salt tax, in 1259 to finance his conquest of the Kingdom of Naples. Outrage over the gabelle fueled the French Revolution. Though the revolutionaries eliminated the tax shortly after Louis XVI, the Republic of France reestablished the gabelle in the early 19th Century; only in 1946 was it removed from the books.

The Erie Canal, an engineering marvel that connected the Great Lakes to New York's Hudson River in 1825, was called "the ditch that salt built." Salt tax revenues paid for half the cost of construction of the canal. The British monarchy supported itself with high salt taxes, leading to a bustling black market for the white crystal. In 1785, the earl of Dundonald wrote that every year in England, 10,000 people were arrested for salt smuggling. And protesting against British rule in 1930, Mahatma Gandhi led a 200-mile march to the Arabian Ocean to collect untaxed salt for India's poor.

In religion and culture, salt long held an important place with Greek worshippers consecrating it in their rituals. Further, in Buddhist tradition, salt repels evil spirits, which is why it is customary to throw it over your- shoulder before entering your house after a funeral: it scares off any evil spirits that may be clinging to your back. Shinto religion also uses it to purify an area. Before sumo wrestlers enter the ring for a match - which is in reality an elaborate Shinto rite a handful is thrown into the center to drive off malevolent spirits.

In the Southwest of the United States, the Pueblo worship the Salt Mother. Other native tribes had significant restrictions on who was permitted to eat salt. Hopi legend holds that the angry Warrior Twins punished mankind by placing valuable salt deposits far from civilization, requiring hard work and bravery to harvest the precious mineral. In 1933, the Dalai Lama was buried sitting up in a bed of salt. Today, a gift of salt endures in India as a potent symbol of good luck and a reference to Mahatma Gandhi's liberation of India.

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The effects of salt deficiency are highlighted in times of war, when human bodies and national economies are strained to their limits. Thousands of Napoleon's troops died during the French retreat from Moscow due to inadequate wound healing and lowered resistance to disease - the results of salt deficiency.

### Questions 1-3

Choose **THREE** letters A-H.

Which **THREE** of the following statements are true of salt?

- A. A number of cities take their name from the word salt.
- B. Salt contributed to the French Revolution.
- C. The uses of salt are countless.
- D. Salt has been produced in China for less than 2000 years.
- E. There are many commercial applications for salt.
- F. Salt deposits in the state of Kansas are vast.
- G. Salt has few industrial uses nowadays.
- H. Slaves used salt as a currency.

# TRUE / FALSE / NOT GIVEN ANSWERS

Mini warm-up practice tests – Choose either *True* or *False*

<b>Passage:</b> As a roller coaster puts the body through weightlessness, high gravitational forces and acceleration, the brain struggles to make sense of conflicting and changing signals from the senses.	<b>Question:</b> The brain has difficulty understanding the messages sent from the senses during rollercoaster rides. <b>True</b>
<b>Passage:</b> This product causes the break-down of excess body fat and will help people shed pounds.	<b>Question:</b> This product helps people lose weight by eliminating extra fat in the body. <b>True</b>
<b>Passage:</b> Symptoms of the flu include fever and nasal congestion.	<b>Question:</b> Stuffiness and elevated temperature are signs of the flu. <b>True</b>
<b>Passage:</b> The tornado razed the town.	<b>Question:</b> The town was obliterated by the cyclone. <b>True</b>
<b>Passage:</b> The gray clouds were a warning of an approaching storm.	<b>Question:</b> The coming storm was foretold by the dark clouds. <b>True</b>
<b>Passage:</b> The still waters of the Caribbean were teal in color.	<b>Question:</b> The turquoise Caribbean waters were calm. <b>True</b>
<b>Passage:</b> It was a spacious room with lit candles all over.	<b>Question:</b> Candles flickered from many areas of the large room. <b>True</b>
<b>Passage:</b> At one level, it should come as no surprise that our state of mind can influence our physiology; anger opens the superficial blood vessels of the face: sadness pumps the tear glands.	<b>Question:</b> We know that emotions sometimes have direct physical effects on the body. <b>True</b>
<b>Passage:</b> The museum has a huge collection of African art.	<b>Question:</b> There is a large exhibit of African art at the museum. <b>True</b>
<b>Passage:</b> Habitation in outer space in huge stations is no longer just a dream, but a reality; the development of space hotels is not far-off.	<b>Question:</b> The concept of the habitation of outer space by mankind is unimaginable. <b>False</b>
<b>Passage:</b> Australians believe that life should have a balance between work and leisure time. As a consequence, some students may be critical of others who they perceive as doing nothing but study.	<b>Question:</b> Students who study all the time may receive positive comments from their colleagues. <b>False</b>
<b>Passage:</b> The free, accessible nature of free-running means it has the potential to engage groups of young people who are typically unmoved by traditional sports. Basically anyone can practise, anywhere-all you need is a decent pair of trainers, so the financial outlay is negligible. There are no joining fees, no forms to fill in and no rules and regulations.	<b>Question:</b> Free-running is an expensive activity for participants. <b>False</b>

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<p><b>Passage:</b> In the security industry today, there are two clear divisions and one of these is decidedly more glamorous than the other. The glamorous part deals with digital security, which includes everything from fighting computer viruses and tackling malicious computer hackers to controlling which employees have access to which systems. All of this has overshadowed the less glamorous side of the industry, which deals with physical security - in essence, door locks, alarms and that sort of thing.</p>	<p><b>Question:</b> Designing ways to protect computers from hackers represents the boring side of the security industry. <b>False</b></p>
<p><b>Passage:</b> While reading a certain amount of writing is as crucial as it has ever been in industrial societies, it is doubtful whether a fully extended grasp of either is as necessary as it was 30 or 40 years ago.</p>	<p><b>Question:</b> Our literacy skills need to be as highly developed as they were in the past. <b>False</b></p>
<p><b>Passage:</b> The laboratory studies similarly show less mental stimulation, as measured by brain-wave production, during viewing than during reading.</p>	<p><b>Question:</b> People's brains show less activity while watching television than when reading. <b>True</b></p>
<p><b>Passage:</b> Australian notions of privacy mean that areas such as financial matters, appearance and relationships are only discussed with close friends. While people may volunteer such information, they may resent someone actually asking them unless the friendship is firmly established. Even then, it is considered very impolite to ask someone what they earn. With older people, it is also rude.</p>	<p><b>Question:</b> It is acceptable to discuss financial issues with people you do not know well. <b>False</b></p>
<p><b>Passage:</b> But most modern humour theorists have settled on some version of Aristotle's belief that jokes are based on a reaction to or resolution of incongruity, when the punchline is either a nonsense or, though appearing silly, has a clever second meaning.</p>	<p><b>Question:</b> Current thinking on humour has largely ignored Aristotle's view on the subject. <b>False</b></p>
<p><b>Passage:</b> Physical exercise helps control insulin levels, while ingesting fat combined with sugars and starches can cause surges in insulin levels.</p>	<p><b>Question:</b> Insulin levels rise sharply when foods with high levels of starch, sugar and fat are eaten. <b>True</b></p>
<p><b>Passage:</b> But since 1980, the amount of water consumed per person has actually decreased, thanks to a range of new technologies that help to conserve water in homes and industry.</p>	<p><b>Question:</b> Modern technologies have led to a reduction in domestic water consumption. <b>True</b></p>

**ANSWER KEYS – TRUE / FALSE / NOT GIVEN**

**TEST 1 - Andrea Palladio: Italian architect**

- Q1. NOT GIVEN
- Q2. TRUE
- Q3. FALSE
- Q4. NOT GIVEN
- Q5. FALSE
- Q6. TRUE
- Q7. TRUE

**TEST 2 - New Agriculture in Oregon, US**

- Q1. FALSE
- Q2. TRUE
- Q3. FALSE
- Q4. TRUE
- Q5. NOT GIVEN

**TEST 3 – Terminated Dinosaur Era**

- Q1. TRUE
- Q2. TRUE
- Q3. FALSE
- Q4. TRUE
- Q5. FALSE
- Q6. NOT GIVEN
- Q7. NOT GIVEN

**TEST 4 – The Dinosaurs Footprints and Extinction**

- Q1. TRUE
- Q2. NOT GIVEN
- Q3. TRUE
- Q4. NOT GIVEN
- Q5. FALSE
- Q6. FALSE

**TEST 5 – Finches on Islands**

- Q1. FALSE
- Q2. NOT GIVEN
- Q3. TRUE
- Q4. FALSE
- Q5. TRUE

**TEST 6 – Koalas**

- Q1. TRUE
- Q2. FALSE
- Q3. FALSE
- Q4. NOT GIVEN
- Q5. TRUE
- Q6. NOT GIVEN
- Q7. TRUE

**TEST 7 – The Origin of Writing**

- Q1. TRUE
- Q2. FALSE
- Q3. NOT GIVEN
- Q4. TRUE
- Q5. FALSE
- Q6. TRUE
- Q7. NOT GIVEN

**TEST 8 – Bondi Beach**

- Q1. FALSE
- Q2. NOT GIVEN
- Q3. NOT GIVEN
- Q4. TRUE
- Q5. FALSE

**TEST 9 – Tea and Industrial Revolution**

- Q1. NOT GIVEN
- Q2. TRUE
- Q3. FALSE
- Q4. FALSE
- Q5. NOT GIVEN
- Q6. TRUE

**TEST 10 – Dyslexia**

- Q1. FALSE
- Q2. TRUE
- Q3. FALSE
- Q4. NOT GIVEN
- Q5. TRUE
- Q6. FALSE.



**ANSWER KEYS – MATCHING HEADINGS**

**Mini warm-up practice test**

**- William Gilbert and**

**Magnetism**

Q1. V

Q2. I

Q3. VI

Q4. X

Q5. IX

Q6. IV

Q7. II

**TEST 1 – Music Language**

**We All Speak**

Q1. III

Q2. VII

Q3. IV

Q4. I

Q5. VIII

**TEST 2 – Communicating**

**Styles and Conflict**

Q1. III

Q2. VII

Q3. I

Q4. IV

Q5. IX

Q6. VIII

Q7. V

Q8. II

**TEST 3 – New Zealand**

**Seaweed**

Q1. V

Q2. II

Q3. VIII

Q4. I

Q5. X

Q6. VI

**TEST 4 - REVIEW OF  
RESEARCH ON THE  
EFFECTS OF FOOD  
PROMOTION TO  
CHILDREN**

Q1. VIII

Q2. II

Q3. VI

Q4. V

Q5. I

Q6. X

Q7. III

**TEST 5 – Accidental**

**Scientists**

Q1. V

Q2. IX

Q3. I

Q4. VI

Q5. X

Q6. VIII

**TEST 6 – Wealth in a cold  
climate**

Q1. III

Q2. VI

Q3. I

Q4. II

Q5. IX

Q6. V

Q7. IV

**TEST 7 – Mose Code**

Q1. X

Q2. XI

Q3. III

Q4. I

Q5. VI

Q6. II

Q7. IX

Q8. VII

**TEST 8 – Saving the British**

**Bitterns**

Q1. II

Q2. V

Q3. I

Q4. VIII

Q5. VI

Q6. III

Q7. IV

**TEST 9 – Corporate Social  
Responsibility**

Q1. V

Q2. VIII

Q3. VI

Q4. VII

Q5. III

Q6. I

Q7. II

**TEST 10 – Are Artists  
Liars?**

Q1. VI

Q2. II

Q3. IV

Q4. VIII

Q5. I

Q6. V

**ANSWER KEYS – MATCHING SENTENCE ENDINGS**

Mini warm-up practice test - Optimism and

Health

- Q1. C
- Q2. A
- Q3. E
- Q4. G
- Q5. D

TEST 1 - Honey bees in trouble

- Q1. B
- Q2. F
- Q3. E
- Q4. A
- Q5. D

TEST 2 - Internal Market: Selling the inside

- Q1. C
- Q2. C
- Q3. D
- Q4. A
- Q5. E
- Q6. B

TEST 3 - Musical Maladies

- Q1. F
- Q2. B
- Q3. A
- Q4. D

TEST 4 - Theory or Practice? – What is the point of research carried out by biz schools?

- Q1. C
- Q2. D
- Q3. A
- Q4. B

TEST 5 - What Do Babies Know?

- Q1. B
- Q2. E
- Q3. A
- Q4. D
- Q5. C

TEST 6 - What is Meaning?

- Q1. B
- Q2. E
- Q3. G
- Q4. A
- Q5. D

TEST 7 - Grimm's Fairy Tales

- Q1. D
- Q2. A
- Q3. H
- Q4. E
- Q5. B

TEST 8 - Personality and appearance

- Q1. D
- Q2. C
- Q3. F
- Q4. E

TEST 9 - Malaria

- Q1. B
- Q2. H
- Q3. G
- Q4. F

TEST 10 - Placebo effect - The Power of Nothing

- Q1. D
- Q2. A
- Q3. G
- Q4. B
- Q5. H
- Q6. F

**ANSWER KEYS – MULTIPLE CHOICE QUESTIONS**

**Mini warm-up practice test - How to Spot a**

**Liar**

Q1. C

Q2. D

Q3. B

Q4. D

**Test 1 - A New Ice Age**

Q1. B

Q2. A

Q3. D

Q4. A

**Test 2 - Activities for Children**

Q1. C

Q2. B

Q3. C

Q4. A

Q5. B

**Test 3 - Tasmanian Tiger**

Q1. B

Q2. D

Q3. A

**Test 4 - Musical Maladies**

Q1. B

Q2. C

Q3. A

Q4. A

**Test 5 - Antarctica - in from the cold?**

Q1. C

Q2. A

Q3. C

Q4. C

Q5. A

**Test 6 - The Significant Role of Mother  
Tongue in Education**

Q1. C

Q2. A

Q3. B

Q4. D

**Test 7 - Global Warming in New Zealand**

Q1. D

Q2. B

Q3. A

Q4. A

Q5. D

**Test 8 - Motivating Drives**

Q1. C

Q2. A

Q3. D

Q4. B

Q5. C

**Test 9 - Texting the Television**

Q1. A

Q2. D

Q3. C

**Test 10 - Designed to Last: Could better  
Design Cure Our Throwaway Culture?**

Q1. D

Q2. B

Q3. B

Q4. D

Q5. C

**ANSWER KEYS – MATCHING NAMES**

Mini warm-up practice test - The world is

our oyster

Q1. C

Q2. B

Q3. D

Q4. A

**TEST 1 - How did writing begin?**

Many theories few answers?

Q1. C

Q2. B

Q3. D

Q4. B

Q5. A

Q6. C

**TEST 2 - Storytelling**

Q1. G

Q2. E

Q3. B

Q4. F

Q5. A

Q6. D

Q7. H

Q8. C

**TEST 3 - Changing Rules of Health**

Treatment

Q1. C

Q2. A

Q3. B

Q4. A

Q5. B

Q6. C

Q7. A

**TEST 4 - To MBA or not to MBA**

Q1. C

Q2. A

Q3. B

Q4. D

Q5. A

**TEST 5 - The Origins of Laughter**

Q1. D

Q2. C

Q3. D

Q4. A

Q5. B

**TEST 6 - Sunset for the Oil Business**

Q1. E

Q2. D

Q3. B

Q4. A

Q5. C

**TEST 7 - History of Refrigeration**

Q1. E

Q2. D

Q3. G

Q4. F

Q5. C

**TEST 8 - Education Philosophy**

Q1. C

Q2. A

Q3. B

Q4. A

Q5. D

**TEST 9 - The "Extinct" Grass in Britain**

Q1. E

Q2. C

Q3. D

Q4. F

Q5. A

**TEST 10 - Stress of Workplace**

Q1. A

Q2. D

Q3. B

Q4. D

Q5. C

## ANSWER KEYS – SUMMARY COMPLETION

### Mini warm-up practice test – California's

#### Age of Megafires

- Q1. SPREAD
- Q2. 10 TIMES
- Q3. RAINFALL
- Q4. FIRE SEASONS
- Q5. FUEL

### TEST 1 - Man or Machine?

- Q1. 17
- Q2. BACKPACK
- Q3. INTERACT
- Q4. FACIAL EXPRESSIONS
- Q5. COG
- Q6. INTELLIGENCE

### TEST 2 - Assessing the Risk

- Q1. CONSUMER'S CHOICE
- Q2. RISK AND BENEFIT
- Q3. SKIING
- Q4. GM CROPS
- Q5. WHEAT AND RICE
- Q6. PRODUCTION
- Q7. MISTRUST

### TEST 3 – The Lost City

- Q1. HOT-AIR BALLOON
- Q2. IRON PARTICLES
- Q3. COMPASS (NEEDLE)
- Q4. THIN METAL PROBE
- Q5. MUDBRICK
- Q6. LOOSER DAMP SOIL
- Q7. SPRING SEASON
- Q8. CLARIFY

### TEST 4 – The Pearl

- Q1. ANCIENT ROME
- Q2. PERSIA
- Q3. MALLORCA
- Q4. JAPAN
- Q5. AUSTRALIA
- Q6. BAHRAIN

### TEST 5 – The Evolutionary Mystery:

#### Crocodile Survives

- Q1. HOT SEASON / DRY SEASON
- Q2. FOUR MONTHS
- Q3. WATER RESOURCES
- Q4. BODY WEIGHT
- Q5. DEYDRATION
- Q6. GROWTH

### TEST 6 – Stress of Workplace

- Q1. WORKPLACE INJURY
- Q2. 16.6 WEEKS
- Q3. 7%
- Q4. GOLF
- Q5. MASSAGE

### TEST 7 – Eco-Resort Management Practices

- Q1. FERRY
- Q2. BICYCLE
- Q3. CEILING FAN
- Q4. AIR CONDITIONER
- Q5. MOSQUITOES

### TEST 8 – Implication of False Belief Experiments

- Q1. CHOCOLATE
- Q2. INFORMATION
- Q3. FOUR / 4
- Q4. OLDER
- Q5. ADULTS
- Q6. CHALLENGING

### TEST 9 – T-Rex: Hunter or Scavenger?

- Q1. SHIN BONE
- Q2. SLOW WALKER
- Q3. CHEETAH
- Q4. RUN FAST
- Q5. BLUNT
- Q6. (ONLY) CRUSH

### TEST 10 – The Bridge that swayed

- Q1. WIND(S)
- Q2. SWAYING
- Q3. FURTHER APART
- Q4. FOOTSTEPS
- Q5. HORIZONTAL FORCES
- Q6. UPRIGHT



## ANSWER KEYS – SHORT-ANSWER QUESTIONS

### Mini warm-up practice test - The 2003

#### Heatwave

- Q1. 1976 / 1995
- Q2. 2000 FLOODING

#### TEST 1 - Spices

- Q1. FOOD POISONING
- Q2. 100 / ONE HUNDRED % / PER CENT
- Q3. SAUSAGE (S)
- Q4. COOLER ONES
- Q5. UNSPICED FOODS
- Q6. SALT

#### TEST 2 - Tower of Strength

- Q1. (BUCKMINSTER) FULLER
- Q2. TENSION BANDS / RUBBER BANDS
- Q3. MICROFILAMENTS
- Q4. (PROTEINS CALLED) INTEGRINS

#### TEST 3 - Ocean Acidification

- Q1. (SMALL) FLAPS
- Q2. (THEIR/THE) SHELLS
- Q3. (ABOUT) 1/3 // A THIRD
- Q4. ROCKS (ON LAND)
- Q5. (OVER) 100,000 YEARS
- Q6. FISHING AND TOURISM (IN EITHER ORDER)
- Q7. CORAL(S)

#### TEST 4 - How Mobile Telephony Turned into a Health

- Q1. (EXISTING) PHONE NETWORKS
- Q2. PRESS A BUTTON
- Q3. (IN) CARS
- Q4. 2G / THE SECOND GENERATION
- Q5. BATTERY DESIGN
- Q6. MACHINE-GENERATED

#### TEST 5 - Automobile's History

- Q1. PETROL-FUELED INTERNAL COMBUSTION
- Q2. IDENTITY AND STATUS
- Q3. 15 MINUTES
- Q4. THE 1973 OIL CRISIS
- Q5. (A) GAS-GUZZLER

#### Q6. FUEL POWER

#### Q7. TOXIC GAS

#### TEST 6 - The Extraordinary Watkin Tench

- Q1. (HIS) DIARIES
- Q2. 3 / THREE YEARS
- Q3. (CONVICT'S) CHAINS
- Q4. GOVERNOR PHILIP
- Q5. JUNE 1789
- Q6. CHINA
- Q7. SYDNEY COVE

#### TEST 7 - Saving the British Bitterns

- Q1. (IN THE) 1950S
- Q2. (BEING) SHY / SHYNESS
- Q3. STARVATION
- Q4. (NATIVE) FISH
- Q5. PARTNERSHIP PROJECT (NETWORK) / NETWORK (OF SITES)
- Q6. OTTER AND BROWN-HERE

#### TEST 8 - Classifying Societies

- Q1. TOOLS
- Q2. NOMADIC
- Q3. GROUPED (TOGETHER)
- Q4. FOODSTUFFS
- Q5. 20.000 PEOPLE / PERSONS
- Q6. CRAFT SPECIALISTS

#### TEST 9 - Thomas Young The Last Know-It-All

- Q1. 46
- Q2. HUMAN EYE ACCOMMODATION
- Q3. INDO-EUROPEAN
- Q4. RICHARD BROCKLESBY
- Q5. ROYAL INSTITUTION
- Q6. GAS LIGHTING

#### TEST 10 - Seaweed for Human Consumption

- Q1. (IT) STIMULATES REPRODUCTION
- Q2. RELATIVELY HIGH
- Q3. DEVELOPMENT AND INVESTMENT
- Q4. CATHOLIC FOOD TASTES

**ANSWER KEYS – MATCHING INFORMATION**

Mini warm-up practice test – Tough Sensor

Can Take the Heat

- Q1. D
- Q2. A
- Q3. E
- Q4. C

TEST 1 – The Pearl

- Q1. A
- Q2. E
- Q3. G
- Q4. C

TEST 2 – How deserts are formed?

- Q1. B
- Q2. G
- Q3. A
- Q4. H
- Q5. D
- Q6. C
- Q7. C

TEST 3 – Timekeeper: Invention of Marine  
Chronometer

- Q1. E
- Q2. A
- Q3. E
- Q4. G
- Q5. B

TEST 4 – The Innovation of Grocery Stores

- Q1. C
- Q2. D
- Q3. C
- Q4. A
- Q5. E

TEST 5 – How Well Do We Concentrate?

- Q1. B

Q2. E

Q3. F

Q4. C

Q5. D

TEST 6 – Keep the Water Away

Q1. D

Q2. B

Q3. G

Q4. A

Q5. F

Q6. E

TEST 7 – The Connection Between Culture  
and Thought

Q1. E

Q2. G

Q3. D

Q4. B

Q5. E

TEST 8 – Monkeys and Forests

Q1. G

Q2. A

Q3. C

Q4. B

Q5. H

Q6. D

TEST 9 – Leaf-Cutting Ants and Fungus

Q1. F

Q2. D

Q3. C

Q4. G

Q5. J

TEST 10 – Antarctica – in from the cold?

Q1. D

Q2. F

Q3. E

Q4. C

Q5. A

## ANSWER KEYS – TABLE COMPLETION

### Mini warm-up practice test – The Bridge that swayed

- Q1. (ENGINEER DESIGNER) ARUP
- Q2. IMPERIAL COLLEGE
- Q3. UNIVERSITY OF SOUTHAMPTON

### TEST 1 – Children's Literature

- Q1. RHYMES, STORIES
- Q2. AMERICA
- Q3. FOLKLORE
- Q4. FAIRY-TALES (-STORIES)
- Q5. ADVENTURES

### TEST 2 – Travel Books

- Q1. PERSIAN WARS
- Q2. ALLIES
- Q3. GEOGRAPHICAL KNOWLEDGE
- Q4. PILGRIMAGE
- Q5. INDIA
- Q6. COLONIES
- Q7. ORGANISATION
- Q8. WEALTHY

### TEST 3 – The Development of Plastics

- Q1. PHOTOGRAPHIC FILM
- Q2. BAKELITE
- Q3. SWITCHES
- Q4. BRITAIN / UK
- Q5. FIREPROOF
- Q6. CLEAR AND GLASS-LIKE
- Q7. RIGID

### TEST 4 – Nature's The Most Violent Wind

- Q1. 88%
- Q2. 11%
- Q3. OVER AN HOUR
- Q4. 25%
- Q5. TRI-STATE TORNADO

### TEST 5 – The Disease Multiply Sclerosis

- Q1. MULTIPLE SCLEROSIS
- Q2. RELAPSE FORM
- Q3. 10-15%

- Q4. WHITE / CAUCASIAN
- Q5. COLDER
- Q6. TWIN
- Q7. SPINAL CHORD

### TEST 6 – Affordable Art

- Q1. PICASSO / PABLO PICASSO
- Q2. ANTHONY GROSS
- Q3. LESSER-KNOWN ARTIST
- Q4. 'UNCOOL' STYLE
- Q5. OIL PAINTING

### TEST 7 – An Ordinary Miracle

- Q1. PLANTING WEEDS
- Q2. MEXICO
- Q3. COMPOST
- Q4. PESTICIDE USE / USE OF PESTICIDE
- Q5. (TEAMS OF) OXEN
- Q6. (AVERAGE) CALORIE INTAKE
- Q7. SOIL (S)
- Q8. INCOME / EARNINGS

### TEST 8 – The Romantic Poets

- Q1. (THE) MEDITERRANEAN
- Q2. GREECE
- Q3. HIS ( COLOURFUL) LIFESTYLE
- Q4. POLITICAL VIEWS
- Q5. OUTPUT
- Q6. FAILING HEALTH
- Q7. CLIMATE

### TEST 9 – Is Technology Harming our Children's Health?

- Q1. SMALLER HEADPHONES
- Q2. DIGITAL MUSIC
- Q3. THE VOLUME
- Q4. 120 DECIBELS
- Q5. (DECIBEL) LEVEL

### TEST 10 – Seaweed for Human Consumption

- Q1. MURLINS
- Q2. (BASIC) GRANT
- Q3. HYBRIDS
- Q4. CROSS-BREEDING (STUDIES)

**ANSWER KEYS – LIST SELECTION**

**Mini warm-up practice test - William**

**Gilbert and Magnetism**

Q1. C

Q2. D

Q3. E

**TEST 1 - Coastal Archeology of Britain**

Q1. B

Q2. D

Q3. F

**TEST 2 - Motivating Drives**

Q1. A

Q2. E

Q3. F

**TEST 3 - Eco-Resort Management Practices**

Q1. A

Q2. C

Q3. E

**TEST 4 - Quantitative Research in**

**Education**

Q1. B

Q2. E

Q3. F

**TEST 5 - Going Nowhere Fast**

Q1. C

Q2. E

Q3. F

**TEST 6 - Two Wings and a Toolkit**

Q1. C

Q2. D

Q3. F

**TEST 7 - Amber - Frozen Moments in Time**

Q1. B

Q2. D

Q3. F

**TEST 8 - Unlikely Boomtowns: The World's**

**Hottest Cities**

Q1. B

Q2. F

Q3. G

**TEST 9 - Changing Rules for Health**

**Treatment**

Q1. B

Q2. D

Q3. G

**TEST 10 - The History of Salt**

Q1. B

Q2. E

Q3. F