

Reading Passage 1

You should spend about 20 minutes on **Questions 1 - 13**, which are based on Reading Passage 1 below.

Soap

One substance everyone uses every day is soap, whether it be for washing our hands using a bar of soap, doing the laundry or washing the floor with detergent. Technically, soaps are ionic compounds from fatty acids and they are used for a variety of cleaning purposes. Soaps allow particles that cannot usually be dissolved in water to be soluble and then be washed away. Although made in a different way, synthetic detergents operate in a similar fashion.

The human skin is under daily attack from various things, such as scorching sun, drying winds, biting cold weather, bacteria and dirt, and so our distant ancestors learned quickly that preserving the health of skin is a way for better and longer life. Popular in different civilisations, the benefits of soap finally managed to appeal to a wide European population in the 17th century, and, since then, the tradition of maintaining high personal hygiene has experienced only constant growth. With its ability to clean people's clothes and disinfect their surroundings from harmful bacteria and dirt, soaps remain one of the most useful and fundamental hygiene tools that mankind ever created.

The first concrete evidence we have of a soap-like substance is dated around 2800 BC. The first soap makers were Babylonians, Mesopotamians, Egyptians, as well as the ancient Greeks and Romans. All of them made soap by mixing fat, oils and salts. Soap was not made and used for bathing and personal hygiene, but was rather produced for cleaning cooking utensils or goods or was used for medicinal purposes. According to Roman legend, their natural soap was first discovered near a mount called 'Sapo', where animals were sacrificed. Rain used to wash the fat from sacrificed animals along with wood ashes into the River Tiber, where the women who were washing clothes in it found the mixture made their washing easier. It is a nice story, but unfortunately there is no such place on record and no evidence for the mythical story.

Soaps today come in three principal forms: bars, powders and liquids. Some liquid products are so viscous that they are gels. Raw materials are chosen according to many criteria, including their human and environmental safety, cost, compatibility with other ingredients, and the desired form and performance characteristics of the finished product. In ancient times, soap was made from animal fats and wood ashes. Today, it is still produced from vegetable or animal fats and alkali. The main sources of fats are beef and mutton tallow, while palm, coconut and palm kernel oils are the principal oils.

In the early beginnings of soap making, it was an exclusive technique used by small groups of soap makers. The demand for early soap was high, but it was very expensive and there was a monopoly on soap production in many areas. Over time, recipes for soap making became more widely known, but soap was still expensive.

Modern soap was made by the batch kettle boiling method until shortly after World War II, when continuous processes were developed. Continuous processes are preferred today, because of their flexibility, speed and economics. The first part of the manufacturing process

is to heat the raw materials to remove impurities. This is followed by saponification, which involves adding a powerful alkali to the heated raw materials. This releases the fatty acids (known as 'neat soap') that are the basis of the soap and a valuable by-product, glycerine. The glycerine is recovered by chemical treatment, followed by evaporation and refining. Refined glycerine is an important industrial material used in foods, cosmetics, drugs and many other products. The next processing for the soap is vacuum spray drying to convert the neat soap into dry soap pellets. The moisture content of the pellets will be determined by the desired characteristics of the soap bar. In the final processing step, the dry soap pellets pass through a bar soap finishing line. The first unit in the line is a mixer, called an amalgamator, in which the soap pellets are blended together with fragrance, shades and all other ingredients. The mixture is then homogenised and refined through rolling mills and refining pladders to achieve thorough blending and a uniform texture. Finally, the mixture is cut into bar-size units and stamped into its final shape in a soap press.

The history of liquid soaps and gels started only recently, when the technological and chemical advancements of the modern age enabled countless inventors to start experimenting with more complicated recipes. The first appearance of liquid soap happened in the mid 1800's with the exploits of several inventors. In 1865, William Shepphard patented liquid soap, however, popularity of this product would not arrive until the creation of Palmolive soap in 1898 by B.J. Johnson.

Advancements in modern chemistry enabled the creation of shower gel. The main difference between liquid soaps and shower gels is that gels do not contain saponified oil. They are based mostly on petroleum, have numerous chemical ingredients that help the easier cleaning of skin, lather better in hard water areas, do not leave a residue on the skin and bathtub, and are in a balanced PH state, so that they do not cause skin irritations. Because some shower gels can cause drying up of the skin after use, many manufacturers insert various moisturisers into their recipes. Some use menthol, an ingredient that gives skin a sensation of coldness and freshness.

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Questions 1 - 4

Do the following statements agree with the information given in the text? In boxes 1 – 4 on your answer sheet write:

TRUE *if the statement agrees with the information*

FALSE *if the statement contradicts the information*

NOT GIVEN *if there is no information on this*

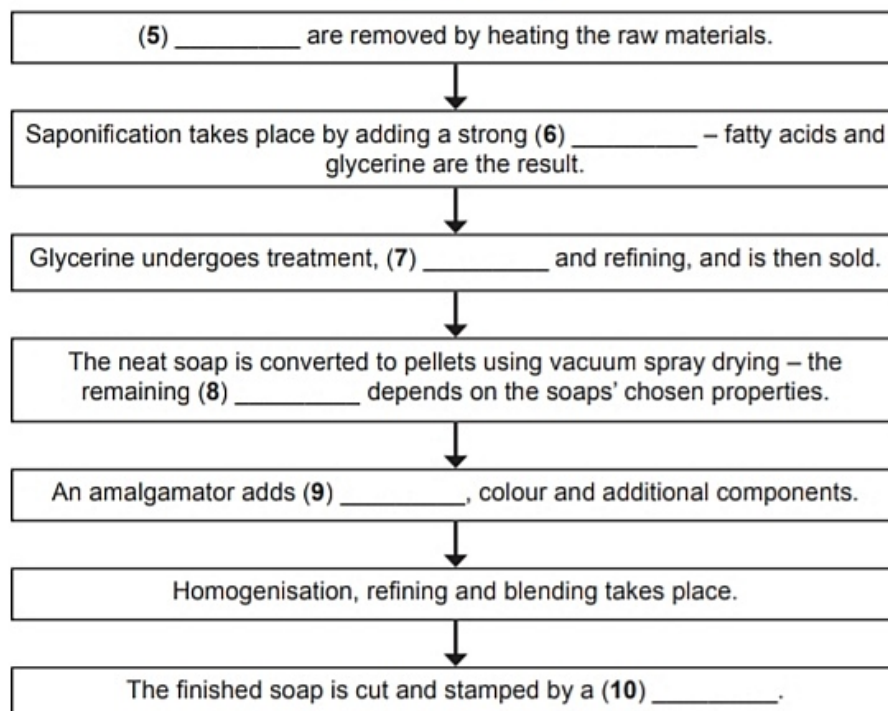
- 1 Current research is working on a way to make soap from discarded bio-rubbish.
- 2 Soap has enjoyed widespread popularity in Europe for over a thousand years.
- 3 One similarity of many ancient soaps is that they all used fat as an ingredient.
- 4 Early soap was an inexpensive product due to an easy availability of ingredients.

Questions 5 – 10

Complete the flow chart below.

Write **NO MORE THAN TWO WORDS** from the text for each answer. Write your answers in boxes 5 – 10 on your answer sheet.

Soap Production



Questions 11 - 13

Complete the sentences below. Write **NO MORE THAN TWO WORDS** from the text for each answer.

Write your answers in boxes 11 - 13 on your answer sheet.

- 11 More complex soap _____ were developed as a result of improvements in technology and chemistry.
- 12 The absence of a _____ on the skin after washing is one benefit of using a shower gel.
- 13 A poor PH balance in soap can cause _____ for users.

Reading Passage 2

You should spend about 20 minutes on **Questions 14 - 26**, which are based on Reading Passage 2 below.

The Sun: Our Nearest Star

The Sun is our nearest star and it dominates our sky from a distance of 'only' 150 million kilometres. Even though it appears to be the same size as the full Moon, it is over 400,000 times brighter, and dictates when we have night and day here on Earth. The Sun is the largest body in the Solar System and it is also the most massive, containing 99.9 per cent of the total mass of all the planets, moons, dwarf planets, asteroids and comets combined. This concentration of mass, and the accompanying gravitational force, is why the Sun sits at the very centre of the Solar System, pulling all the other bodies in orbit around it. We are entirely dependent on the Sun for the habitability of our planet, as it provides us with the energy in the form of heat and light that we require to survive. But it also brings many potential hazards, from the continual flow of hazardous radiation that always lurks just beyond Earth's atmosphere, to the sporadic and violent space weather that threatens much of our society's infrastructure.

Given that the Sun has a volume that is over a million times that of the Earth, yet contains only 330,000 times the mass, we can immediately deduce that its average density is far lower than that of a terrestrial planet. Indeed, the average density is about the same as that of water, and less than a quarter of the density of the Earth. The Sun is made mainly of the lightest elements, hydrogen (the Sun's fuel) and helium, in a gaseous form.

The source of the Sun's energy remained a mystery until Einstein's 1905 special theory of relativity highlighted the promise of efficient nuclear fusion. For nuclear fusion to occur, matter needs to be under conditions of tremendous pressure and of extreme heat, so that the electric repulsion can be overcome, and the nuclei get close enough to smash into each other. It was the English astronomer Sir Arthur Eddington who realised in the 1920's that the physical conditions within the core of the Sun were extreme enough to permit the necessary nuclear reactions. The Sun converts 600,000 million kilograms of hydrogen to helium every second to sustain its phenomenal energy output.

The Sun's core is approximately 15,000,000 degrees Celsius and is the site of the nuclear fusion. The energy from the core travels outwards through the radiation zone by the transfer of the energy from one molecule to another. Heated gases move the energy from the radiation zone through to the convection zone, where the gases start to cool and this causes them to sink back down to the radiation zone. Outside the convection zone is the photosphere, which is approximately 500 kilometres thick and is the surface layer of the sun. Beyond, there is a thin layer of gas that surrounds the photosphere called the chromosphere. Finally, the corona is another layer of gas that extends a long way outside of the Sun.

Observations of more evolved objects around us in the galaxy lead to our understanding of the eventual fate of the Sun. The Sun has sufficient hydrogen at the right temperature and density to continue creating helium for a further six billion years. Then, the supply of fuel, and all possibility of future nuclear reactions, will eventually be exhausted. By this point, the Sun will appear very different from how it does today. It will have become a red giant; a much cooler, redder and far more bloated version of itself, with an atmosphere puffed so large as

to swallow up the planets Mercury and Venus and make conditions pretty uncomfortable on Earth. Eventually, the outer envelope of the red giant will be lost, expanding away to form a planetary nebula. The remaining hot core of the star will be left exposed as a white dwarf, which will slowly cool and fade over billions of years, until finally fading into a cold, dark and dense ball of compressed matter.

From time to time, there are eruptions of matter from the Sun. The magnetic energy in an exceptionally powerful sun flare can heat and speed up a huge cloud of charged particles to form a coronal mass ejection. The cloud produced by such an eruption escapes away out into interplanetary space, but can cause concern if directed towards Earth. When a coronal mass ejection reaches the Earth, it rattles the Earth's magnetic field to generate what is known as a 'geomagnetic storm'. The occurrence of the flare gives us advance notice of this event and that it will arrive between 15 hours and a couple of days later, depending on how fast it's moving, and how clear the passage between Sun and Earth is. The major effect for humans of a coronal mass ejection is on our satellites, which can be seriously damaged. Power cuts on Earth can also take place.

Although we may now understand the basics of the Sun, we remain unable to reliably predict everything about it. There is much still to understand and learn about it, and it seems the more intensely it is studied, the more questions there are to answer!

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Questions 14 - 19

Complete the notes below.

Write **NO MORE THAN TWO WORDS** for each answer.

Write your answers in boxes **14 - 19** on your answer sheet.

THE SUN

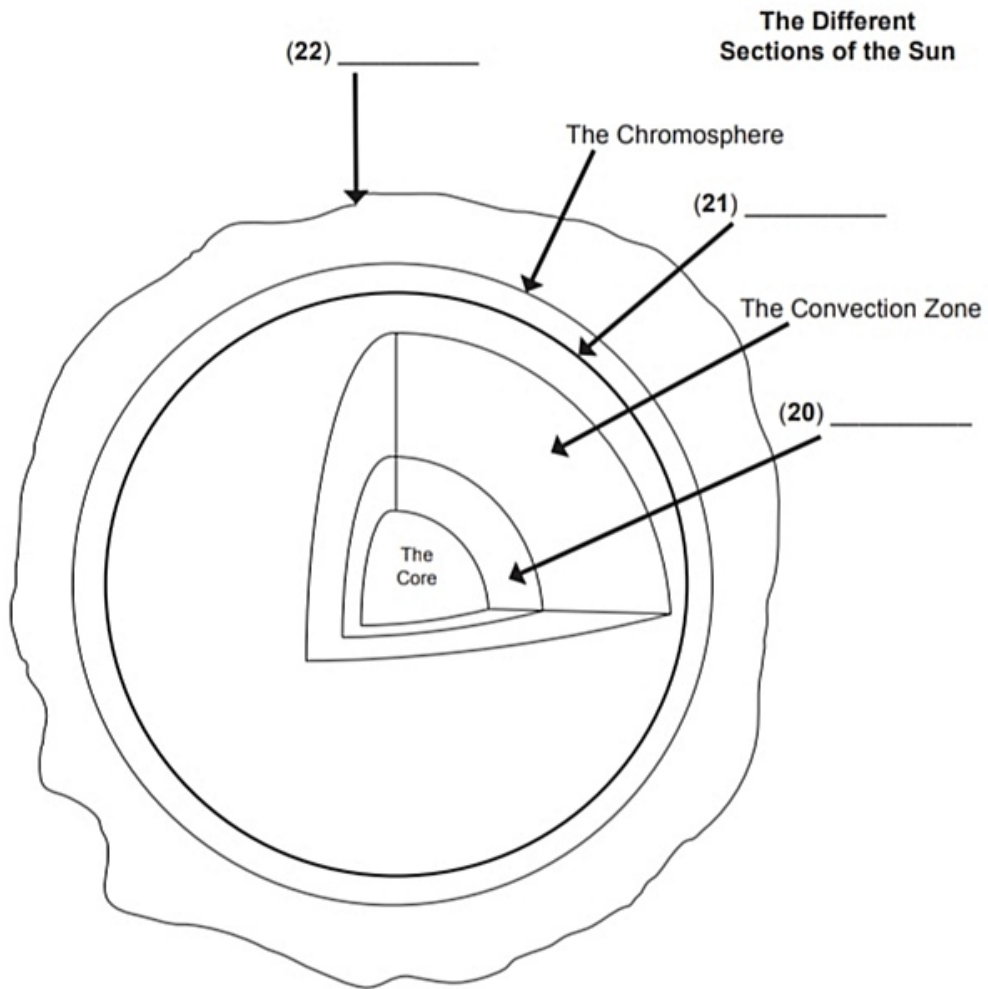
- * The Sun is the Earth's (14) _____.
- * The Sun contains 99.9% of the entire (15) _____ of our solar system.
- * The Sun gives us the energy we need to survive, but also danger in the form of dangerous (16) _____ and powerful space weather.
- * In spite of its size, the Sun has a low average (17) _____.
- * Nuclear fusion requires extreme (18) _____ and heat, which the Sun can provide.
- * The Sun's energy is created from nuclear fusion changing (19) _____ to helium.

Questions 20 - 22

Label the diagram below.

Write **NO MORE THAN THREE WORDS** from the text for each answer.

Write your answers in boxes **20 - 22** on your answer sheet.



Questions 23 - 26

Answer the questions below.

Write **NO MORE THAN THREE WORDS AND/OR A NUMBER** from the text for each answer.

Write your answers in boxes **23 - 26** on your answer sheet.

- 23 For how much longer will the Sun continue to operate nuclear fusion?
- 24 What will the outer section of the Sun become following the red giant stage?
- 25 What part of a powerful Sun flare heats up and accelerates the particles that make up a coronal mass ejection?
- 26 What can the geomagnetic storms caused by coronal mass ejections cause on Earth?

Reading Passage 3

You should spend about 20 minutes on **Questions 27 - 40**, which are based on Reading Passage 3 below.

The Good-Enough Mother

Throughout history, new parents have experienced the pressures and responsibilities that come with rearing a child. The mother in particular, for biological and societal reasons, is under stress to fulfill the expectations that she and society puts on her. Donald Winnicott, a British paediatrician and psychoanalyst, broke ground and shocked those around him with his original views on the relationship between children and their mothers. Winnicott challenged the traditional and idealised view of parenting and provided theory and guidance that was more grounded in the reality of parenthood. Winnicott's notions of the 'good-enough' mother and the facilitating environment that he described remain important in the study of child development.

It would not be an exaggeration to say that most parents try to provide the best for their children, and many feel guilty when they are not able to do so, especially when many women and men in the modern world try to balance personal and professional lives with perfect parenthood. This key role for adults in today's world has led to this subject being intensively examined and various theories of parenting being created. While a variety of models have informed the development of parenting programmes, four core theories underpin the majority of them.

Social learning theory is based on the assumption that children's behaviour will improve when appropriately reinforced; good behaviour is rewarded and bad behaviour is either ignored or appropriately sanctioned. Social learning theory-based programmes teach parents strategies for punishing child misconduct and rewarding positive behaviour.

Attachment theory is based on the notion that an infant's ability to form a strong emotional bond with their primary caregiver is a natural part of its development. The security of this bond, also known as attachment security, is largely determined by the parents' ability to respond sensitively and appropriately to their infant's bids for attention. Programmes based on attachment theory therefore aim to improve parental sensitivity by increasing parents' understanding of their children's requirements and attachment related conduct.

Parenting styles theory is based on research that suggests children's behaviour is directly related to their parent's child-rearing practices. Parents who combine high levels of parental warmth with high levels of supervision are likely to have children who are more confident, more autonomous and more socially responsible. This parenting style is often referred to as an authoritative style of parenting, as it recognises the child as an individual in his or her own right. For this reason, many parenting programmes include elements that encourage parents to allow their children to experience risk-taking amidst high levels of supervision.

The model of human ecology assumes that a child's development is determined by his or her interaction within the environments of the individual, family, school, community and culture. Each of these environments contains elements that can either improve a child's life outcomes or place them at risk for adversity. Every family is unique in terms of these risk and protective factors influencing it. Programmes based on this model consider ways to strengthen protective factors in order to manage any on-going risks.

Winnicott's idea of a facilitating environment created for a child by a 'good-enough mother', who is supported by the adults around her, rests easily alongside the theory of attachment. Winnicott's facilitating environment is provided by an unconscious process within an ordinary mother who is fond of her baby. Winnicott suggests that during pregnancy, a mother develops a state of heightened sensitivity, which continues to be maintained for some weeks after the baby's birth. When this heightened state passes, the mother has what Winnicott calls a 'flight into sanity', and she begins to be aware of the world that exists outside of her state of primary maternal preoccupation with her infant.

The good-enough mother then continues to provide an environment that facilitates healthy maturational processes in her baby. She achieves this by being the person who wards off the unpredictable and who actively provides care in the holding, handling and in the general management of the child. The good-enough mother provides physical care and meets her baby's need for emotional warmth and love. She also protects her baby against those parts of her from which murderous feelings are brought forth when, for example, her baby screams, yells and cries continuously. By containing her own hateful feelings about her baby, and using them to intuit the baby's terror and hate, the good-enough mother facilitates her baby's thoughts and expressions of omnipotence by adapting to his needs until such time as he gradually begins to feel safe enough to relinquish these feelings. At this stage, the process of integration can start and the baby begins to develop a sense of 'me' and 'not me'. To achieve this shift in the baby, the good-enough mother must, by a gradual process, fail to adapt to her baby's needs in order that the baby can begin to learn to tolerate the frustrations of the world outside of himself and his mother.

Winnicott intended to take the pressure off women who became mothers, but critics have argued that Winnicott's idea of the good-enough mother has placed the undue expectations upon the 'real' mother that she must shoulder most of the responsibility for the care of her baby. Furthermore, she is held responsible for how well her baby flourishes.

Like many social theories of child development, it is clear to outsiders that real life practice exhibits characteristics of all theory and most parents show parts of each theory in order to adapt naturally to whatever situations arise. Nevertheless, Winnicott's ideas have been a source of comfort and hope to many mothers who have naturally struggled with the challenge of motherhood.

Questions 27 - 30

Do the following statements agree with the views of the writer of the text?

In boxes 27 - 30 on your answer sheet write:

- YES** *if the statement agrees with the writer's views*
- NO** *if the statement doesn't agree with the writer's views*
- NOT GIVEN** *if it is impossible to say what the writer thinks about this*

- 27 Mothers are under pressure from themselves and society's expectations to be good mothers.
- 28 Today, the field of child development is not influenced much by Winnicott's theories.
- 29 A man's traditional role as the breadwinner means that he has less pressure to be an excellent parent.
- 30 Parenting has not been a subject that has been widely studied.

Questions 31 - 36

Complete the table below. Write **NO MORE THAN TWO WORDS** from the text for each answer. Write your answers in boxes 31 - 36 on your answer sheet.

Four Core Theories of Parenting	
Social Learning Theory	Based on how reactions to children's (31) _____ are reinforced. Good conduct is rewarded and poor conduct ignored or sanctioned. Parents can be taught (32) _____ for the above.
Attachment Theory	Based on the powerful (33) _____ between an infant and its caregiver and how this is created by how parents deal with their children's needs. Parents can be taught a better sensitivity and (34) _____ of children's needs and behaviour.
Parenting Styles Theory	Based on the relationship between a child's behaviour and the parents' parenting skills. Also known as an authoritative style. Parents are taught to encourage appropriate (35) _____.
Human Ecology	Based on a child's relationship with its environment and the risks within it. Parents are taught to improve (36) _____ related to the risks.

Questions 37 – 40

Complete the summary below.

Write **NO MORE THAN TWO WORDS** from the text for each answer.

Write your answers in boxes **37 - 40** on your answer sheet.

The Good-Enough Mother

Winnicott's theories are linked to the theory of attachment - an (37) _____ on the part of the mother builds the relationship between mother and child. A mother's heightened sensitivity before and after birth soon changes and allows her to realise how life carries on away from her child.

The good-enough mother manages her child to develop his/her healthy (38) _____. She provides care and love and deals with the natural negative feelings produced by the pressure of caring for a baby. By doing so, the baby slowly realises he/she is safe and must abandon its feelings of (39) _____. In order to succeed, a good-enough mother must fail to fulfil some of the baby's needs, so the baby learns the realities and independence of life.

Critics say Winnicott did not alleviate pressure from mothers, but increased (40) _____ that she must be solely responsible for rearing the child successfully.