



GRADE 8

NATURAL SCIENCES

JUNE 2018

TIME: 1½ HOUR

MARKS: 70

INSTRUCTIONS

1. The paper consists of SEVEN questions. Answer ALL the questions.
2. Number all the answers exactly as the questions are numbered in the paper.
3. A periodic table has been attached at the end of the question paper.

SECTION A

QUESTION 1

1.1 Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A – D) next to the question number (1.1.1 – 1.1.10).

1.1.1 The most important source of light and heat on Earth is ...

- A oil.
- B electricity.
- C the Sun.
- D volcanoes. (1)

1.1.2 The products of photosynthesis are ...

- A glucose and oxygen.
- B carbon dioxide and water.
- C glucose and carbon dioxide.
- D carbon dioxide and oxygen. (1)

1.1.3 Ecology is ...

- A a combination of all ecosystems.
- B the study of the interactions of organisms with each other and their physical and chemical environment.
- C a community of animals, plants and people.
- D a group of people that stays in one place that has a specific common characteristic. (1)

1.1.4 The following is an example of a biotic component of an ecosystem.

- A A clean cement dam that contains only water.
- B The wind.
- C Heat.
- D A grassland. (1)

1.1.5 The following is NOT an example of a micro-organism.

- A Virus.
- B Mushroom.
- C Bacterium.
- D Protista. (1)

1.1.6 Atoms consist of ...

- A elements and compounds.
- B neutrons, electrons and compounds.
- C protons, electrons and neutrons.
- D elements, compounds, neutrons, electrons and protons. (1)

1.1.7 The following particles are found in the nucleus of an atom:

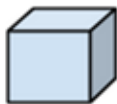
- A Neutrons and electrons.
- B Neutrons, elements and electrons.
- C Protons and neutrons
- D Protons, electrons and neutrons. (1)

1.1.8 The melting point of element X is 25°C. The boiling point of the same element is 70°C. At 30°C the element is a ...

- A solid.
- B liquid.
- C gas.
- D vapour. (1)

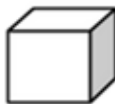
1.1.9 In which one of the following substances will the distances between the particles inside the substance be the greatest? All substances shown have the same volume.

A



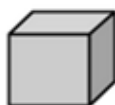
an iron block

B



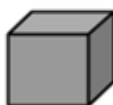
**a square container filled
water**

C



**a square container filled
with air**

D



**a square container filled
with sand**

(1)

1.1.10 The reactants in a chemical reaction are ...

- A all the substances that appear in the solid phase.
- B the new substances that are formed.
- C all the substances that are involved.
- D all the substances that react with each other.

(1)

[10]

1.2 Give **ONE word/term** for each of the following statements. Write only the word/term next to the question number.

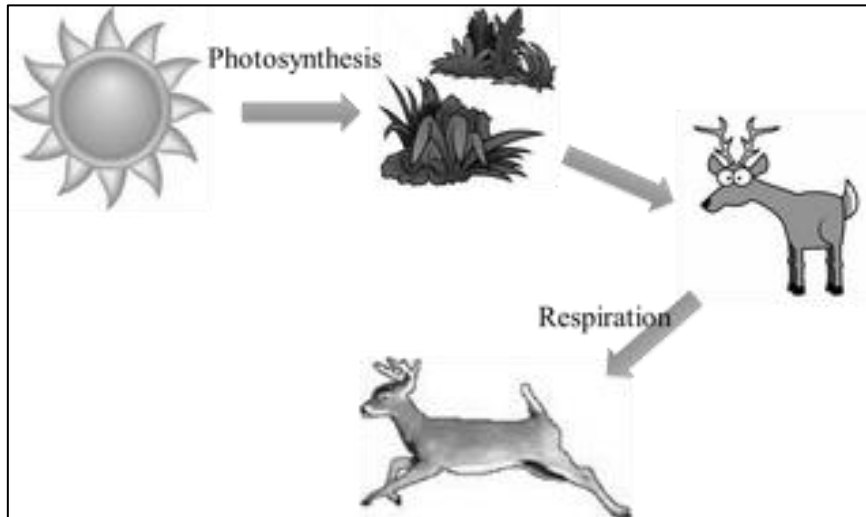
- 1.2.1 The process whereby energy is released from food through a range of chemical reactions. (1)
- 1.2.2 The term used for the various stages in the food chain. (1)
- 1.2.3 Living objects that are too small to view with the naked eye and can only be observed through a microscope. (1)
- 1.2.4 Positively charged particles in the nucleus of an atom. (1)
- 1.2.5 The name of the scientific theory that explains that all matter (solids, liquids and gases) consists of particles. (1)

[5]

TOTAL SECTION A: 15

SECTION B**QUESTION 2**

The following diagram illustrates two life sustaining processes. Answer the questions that follow:

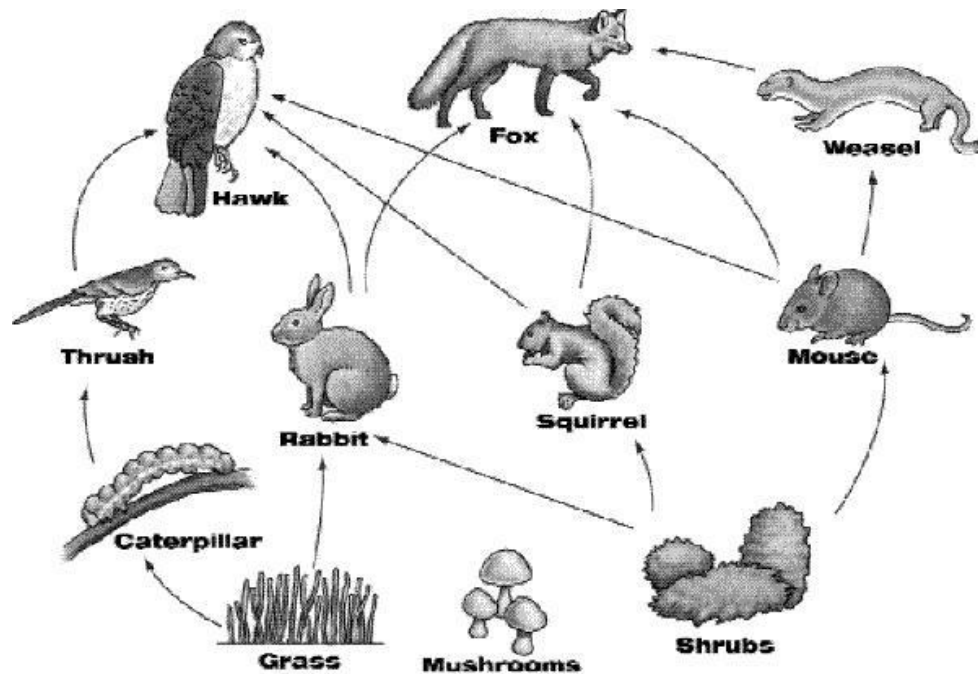


- 2.1. Describe the process of photosynthesis. (2)
- 2.2 Write down the word equation for respiration. (2)
- 2.3 Which process will take place in the following organisms? **ONLY** write **PHOTOSYNTHESIS** or **RESPIRATION** or **BOTH**.
- 2.3.1 Animals (1)
- 2.3.2 Plants (1)
- 2.4 Explain the relationship between glucose and starch. (1)
- [7]**

QUESTION 3

3.1 Explain the difference between producers and consumers in a food web. (2)

3.2 Study the diagram of a food web.



Give an example of each of the following from the food web:

3.2.1 A producer (1)

3.2.2 A tertiary consumer (1)

3.2.3 An insectivore (1)

3.2.4 A predator (1)

3.3 Explain the impact on the food web if the hawk is removed from the food web. (3)

3.4 Listed below are three types of adaptations:

- **Structural**
- **Functional**
- **Behavioural**

Use the list to identify the type of adaptation in each of the following cases:

- 3.4.1 The jaw of a rabbit is adapted for a herbivore diet. (1)
- 3.4.2 Coats of mice grow faster and become thicker when they relocate to colder areas. (1)
- 3.4.3 Hawks have hooked beaks that are designed for tearing off meat. (1)
- 3.4.4 Mushrooms increase the surface area of the gills under their caps to produce more spores. (1)
- 3.5 Explain why it is important that organisms can adapt. (2)
- [15]**

QUESTION 4

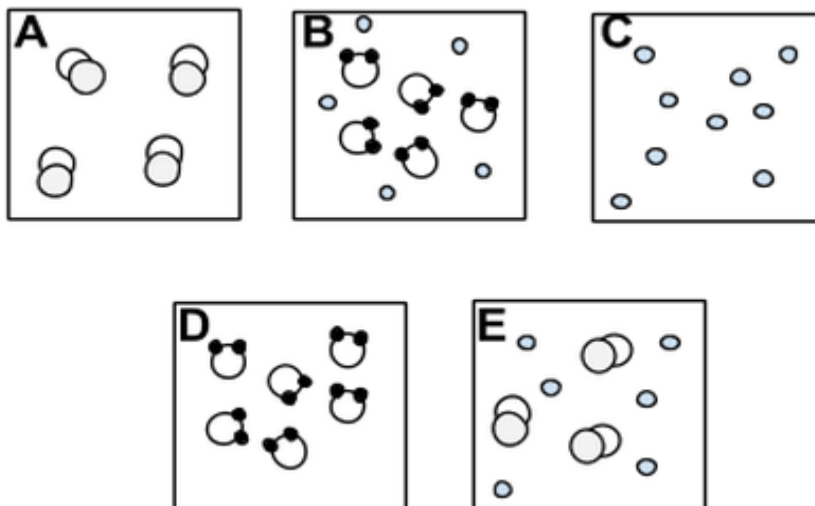
Give an **EXAMPLE** for each of the following:

- 4.1 A virus that causes AIDS. (1)
- 4.2 Food that is produced by using micro-organisms. (1)
- 4.3 Medicine that is produced by using micro-organisms. (1)
- 4.4 The name of a scientist that developed a method to remove bacteria by boiling and cooling of liquids. (1)
- [4]**

TOTAL SECTION B: 26

SECTION C**QUESTION 5**

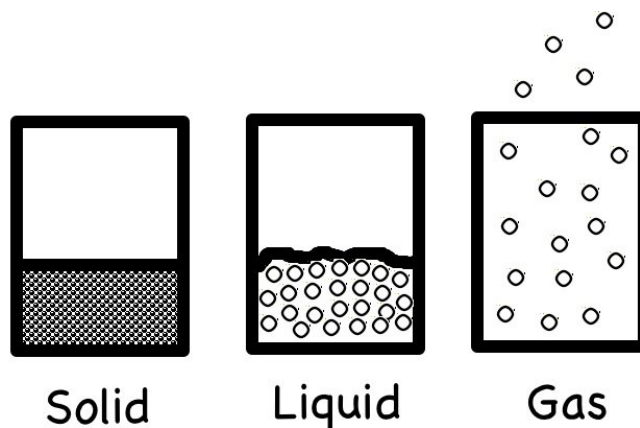
- 5.1 Different types of substances are represented in the diagrams below. Answer the questions that follow:



Write down the LETTER of the diagram which best represents:

- 5.1.1 An element that consists of single atoms. (1)
- 5.1.2 An element that consists of diatomic molecules. (1)
- 5.1.3 A compound. (1)
- 5.1.4 A mixture of elements. (1)

5.2 Consider the three phases of matter illustrated in the diagram below.



Describe in detail the arrangement and behaviour of particles in a gas. (4)

5.3 When you walk past a bakery, you can smell the fresh bread that is being baked. This is possible due to the diffusion of gases.

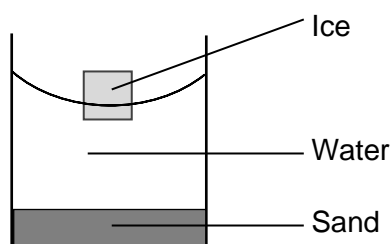
5.3.1 Explain what diffusion is. (2)

5.3.2 How does diffusion that take place in liquids compare to diffusion in gases? (1)

5.3.3 Explain why it is NOT possible for diffusion to take place in solids. (2)
[13]

QUESTION 6

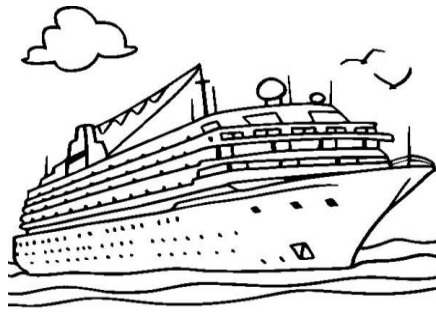
6.1 When sand and ice are added to a glass of water, the sand sinks to the bottom of the glass while the ice floats on the water as shown below.



6.1.1 Write down a definition for density. (2)

6.1.2 Write down the three substances (water, sand and ice) in order of INCREASING density. (3)

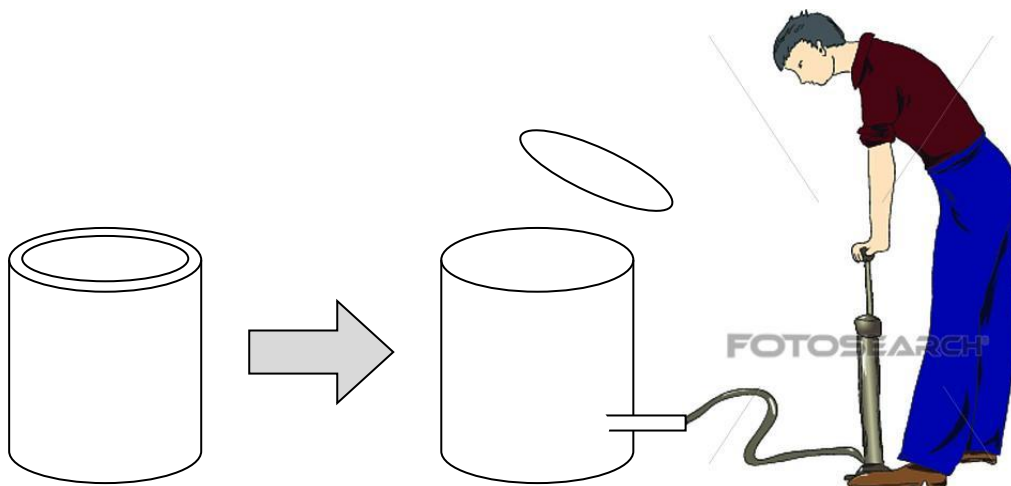
6.2 Consider the picture of a ship sailing on the sea.



6.2.1 Which one of water and iron has the highest density? (1)

6.2.2 Explain, by referring to density, why a ship can float on water. (2)

6.3 Study the following diagram. An empty paint tin with its lid on, is full of air. When more air is pumped into the tin, the lid pops off at some stage.



Explain why the lid pops off when more air is pumped into the tin.

(3)
[11]

QUESTION 7

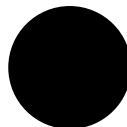
7.1 Atoms of oxygen, hydrogen and carbon are represented by the following symbols:



Oxygen



Hydrogen



Carbon

Use the above symbols to draw the following:

7.1.1 One water molecule (2)

7.1.2 Carbon + oxygen gas \rightarrow carbon dioxide (3)
[5]

TOTAL SECTION C: 29

GRAND TOTAL: 70

TABLE 3: THE PERIODIC TABLE OF ELEMENTS/TABEL 3: DIE PERIODIEKE TABEL VAN ELEMENTE

KEY/SLEUTEL																		Atomic number Atoomgetal	
Electronegativity Elektronegatiwiteit																		Symbol Simbool	
Approximate relative atomic mass Benaderde relatieve atoommassa																			
1 (I)	2 (II)	3	4	5	6	7	8	9	10	11	12	13 (III)	14 (IV)	15 (V)	16 (VI)	17 (VII)	18 (VIII)	2 He	
1 H 1,01	3 Li 7	4 Be 9	5 B 10,81	6 C 12,01	7 N 14,01	8 O 16,00	9 F 18,99	10 Ne 20,18	11 Na 22,99	12 Mg 24,31	13 Al 26,98	14 Si 28,09	15 P 30,97	16 S 32,06	17 Cl 35,45	18 Ar 39,94	19 K 39,09	20 Ca 40,08	
19 K 39,09	20 Ca 40,08	21 Sc 44,96	22 Ti 47,88	23 V 50,94	24 Cr 51,99	25 Mn 54,94	26 Fe 55,85	27 Co 58,93	28 Ni 58,69	29 Cu 63,55	30 Zn 65,38	31 Ga 69,72	32 Ge 72,64	33 As 74,92	34 Se 78,96	35 Br 79,90	36 Kr 83,80	37 Rb 85,47	
37 Rb 85,47	38 Sr 87,62	39 Y 88,91	40 Zr 91,22	41 Nb 92,91	42 Mo 95,94	43 Tc 98,91	44 Ru 101,07	45 Rh 102,91	46 Pd 106,42	47 Ag 107,87	48 Cd 112,41	49 In 114,82	50 Sn 118,71	51 Sb 121,76	52 Te 127,60	53 I 126,91	54 Xe 131,29	55 Cs 132,91	
55 Cs 132,91	56 Ba 137,33	57 La 138,91	58 Ce 140,12	59 Pr 140,91	60 Nd 144,24	61 Pm 144,91	62 Sm 150,36	63 Eu 151,96	64 Gd 157,25	65 Tb 158,93	66 Dy 162,50	67 Ho 164,93	68 Er 167,26	69 Tm 168,93	70 Yb 173,05	71 Lu 174,97	72 Hf 178,49	73 Ta 180,95	
73 Ta 180,95	74 W 183,84	75 Re 186,21	76 Os 190,23	77 Ir 192,22	78 Pt 195,08	79 Au 196,97	80 Hg 200,59	81 Tl 204,38	82 Pb 207,2	83 Bi 208,98	84 Po 209	85 At 210	86 Rn 222	87 Fr 223	88 Ra 226	89 Ac	90 Th 232	91 Pa 231	
91 Pa 231	92 U 238,03	93 Np 237,05	94 Pu 244,06	95 Am 243,06	96 Cm 247,07	97 Bk 247,07	98 Cf 251,08	99 Es 252,08	100 Fm 257,10	101 Md 258,10	102 No 259,10	103 Lr 262,11	104 Rf 261	105 Db 262	106 Sg 266	107 Bh 264	108 Hs 277	109 Mt 268	