



education

Department of
Education
FREE STATE PROVINCE

GRADE 8

NATURAL SCIENCES

PS: MATTER AND MATERIAL

REVISION BOOKLET (2020)

QUESTION PAPER A – Page 1

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QUESTION PAPER C – Page 11

REVISION QUESTION PAPER 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 – 1.1.5).

1.1.1 What are the horizontal rows on the Periodic Table called?

- A Groups
- B Columns
- C Families
- D Periods (1)

1.1.2 If an atom has 12 protons in the nucleus, then it must also have ... to be neutral.

- A 12 protons around the nucleus
- B 12 neutrons in the nucleus
- C 12 electrons around the nucleus
- D 12 electrons in the nucleus (1)

1.1.3 Which of the following is a property of a solid?

- A It flows.
- B The particles slide past each other.
- C It undergoes a phase change.
- D It has a defined shape. (1)

1.1.4 Melting is the change in state of a...

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

1.1.5 Water is different from other substances because it is ...

- A more dense as a solid than a liquid.
- B less dense as a solid than a liquid.
- C more dense as a solid than a gas.
- D less dense as a solid than a gas. (1)

[5]

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 A sub-atomic particle with a positive charge. (1)

1.2.2 The spontaneous spreading of particles from an area of high concentration to an area of low concentration. (1)

1.2.3 The amount of mass per unit volume. (1)

1.2.4 A substance that cannot be broken down into simpler substances by chemical methods. (1)

1.2.5 Matter that can flow and does not have a specific shape. (1)

[10]

QUESTION 2

2.1 Use the Periodic Table of elements provided to write down the NAME of an element that:

2.1.1 is a non-metal in Group 1. (1)

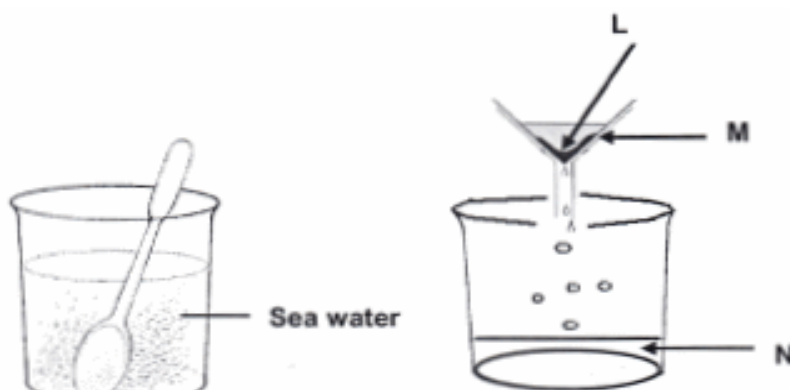
2.1.2 is represented by the symbol **Na**. (1)

2.1.3 has six protons in the nucleus of one atom. (1)

2.1.4 is a noble gas in period 2. (1)

2.1.5 is in Group 2, Period 3. (1)

- 2.2 Marius collected some sea-water near the beach. The sea-water tasted salty and was full of fine sand. He separated the sand from the sea-water using the apparatus shown below.



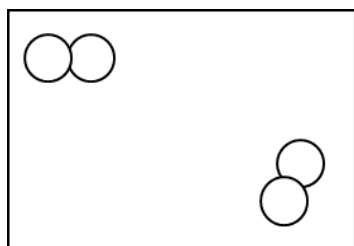
Apparatus used to separate sand from the sea water

- 2.2.1 Name the apparatus labelled **M**. (1)
- 2.2.2 Name the method used here to separate the sand from the sea-water. (1)
- 2.2.3 Substance **L** was retained by the filter paper. Give the name of the substance. (1)
- 2.2.4 Substance **N** passed through the filter paper. Name one ingredient of substance **N**. (1)

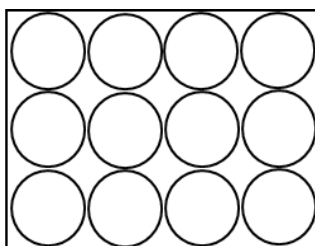
[9]

QUESTION 3

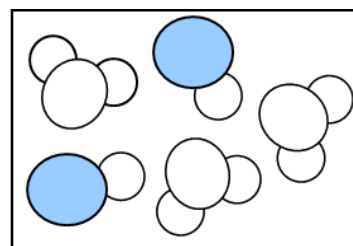
- 3.1 The particle model of matter can be used to represent different substances.



A



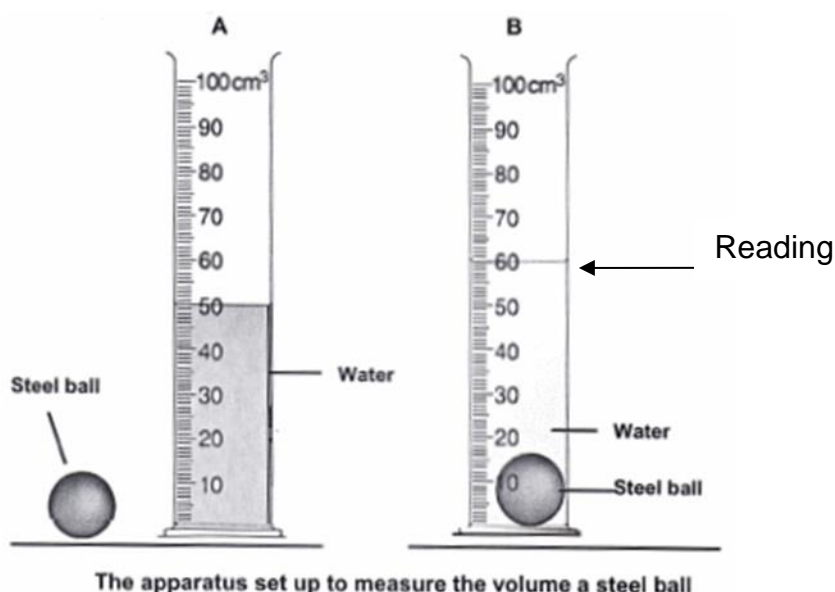
B



C

- 3.1.1 Which diagram, **A**, **B** or **C**, represents a diatomic molecule? Give a reason for your answer. (2)

- 3.1.2 Compare the three phases of matter in terms of the forces between the particles. (3)
- 3.1.3 How many types of molecules are found in diagram **C**? (1)
- 3.1.4 Which diagram represents particles with the highest average kinetic energy? Explain your answer in terms of the particle model of matter. (2)
- 3.1.5 Why does diffusion not take place in **B**? (2)
- 3.2 A learner sets up the apparatus shown below to measure the volume of a steel ball. Study the diagrams and answer the questions that follow.

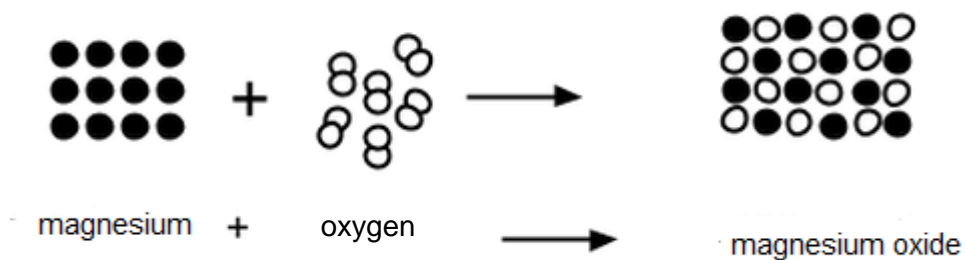


- 3.2.1 Give the name of the apparatus which is used to measure the volume of the steel ball. (1)
- 3.2.2 When a steel ball is carefully placed into apparatus **A**, the water level increases to show a new volume as shown in **B**. Write down the new reading for the volume of the water in apparatus **B**. (1)
- 3.2.3 Calculate the volume of the steel ball from the information shown above. Show all your calculations. (2)
- 3.2.4 Explain why the steel ball drops to the bottom. (1)

[15]

QUESTION 4

A chemical reaction is represented by the following diagram:



- 4.1 Write the name of the product(s) for this reaction. (1)
- 4.2 Describe in which way the atoms in this reaction are the same before and after the reaction. (2)
- 4.3 Describe in which way the atoms in this reaction differ before and after the reaction. (2)
- 4.4 In which phase does the product occur? Give a reason for your answer, visible in the diagram. (2)

[7]

TOTAL: [51]

REVISION QUESTION PAPER B**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 – 1.1.5).

1.1.1 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)

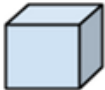
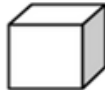
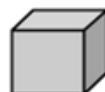
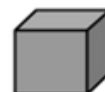
1.1.2 The following particles are found in the nucleus of an atom:

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

1.1.3 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)

- 1.1.4 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		B	
	an iron block		a square container filled water
C		D	
	a square container filled with air		a square container filled with sand

(1)

- 1.1.5 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)

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

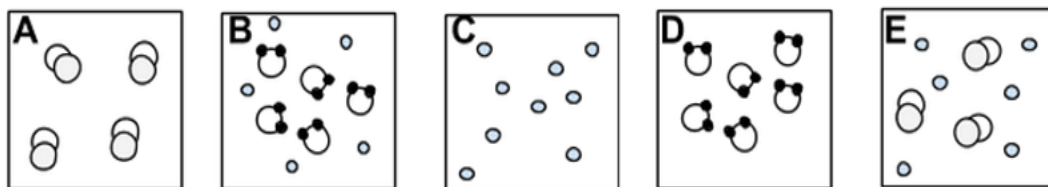
1.2.1 Positively charged particles in the nucleus of an atom. (1)

1.2.2 The name of the scientific theory that explains that all matter (solids, liquids and gases) consists of particles. (1)

[7]

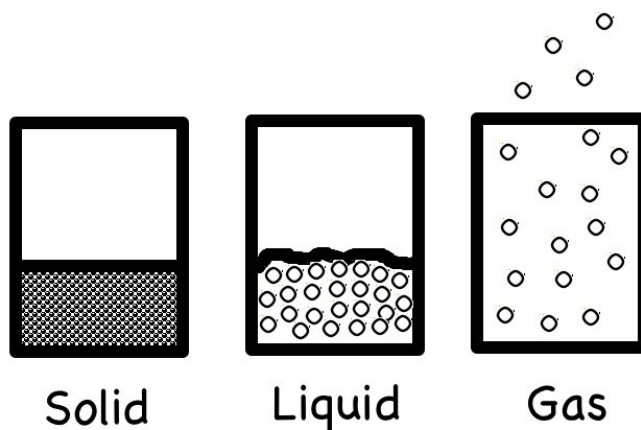
QUESTION 2

2.1 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:

- 2.1.1 An element that consists of single atoms. (1)
- 2.1.2 An element that consists of diatomic molecules. (1)
- 2.1.3 A compound. (1)
- 2.1.4 A mixture of elements. (1)
- 2.2 Consider the three phases of matter illustrated in the diagram below.



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

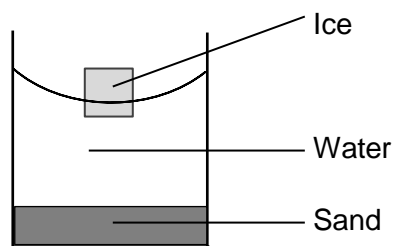
2.3 When you walk past a bakery, you can smell the fresh bread that is being baked. This is possible due to the diffusion of gases.

- 2.3.1 Explain what diffusion is. (2)
- 2.3.2 How does diffusion that take place in liquids compare to diffusion in gases? (1)
- 2.3.3 Explain why it is NOT possible for diffusion to take place in solids. (2)

[13]

QUESTION 3

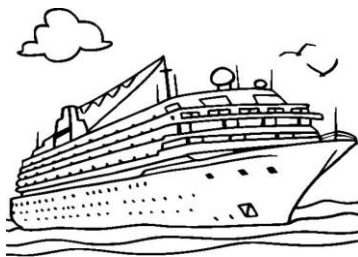
3.1 When sand and ice are added to a glass of water, the sand sinks to the bottom of the glass while the ice floats on the water as shown below.



3.1.1 Write down a definition for density. (2)

3.1.2 Write down the three substances (water, sand and ice) in order of (3)

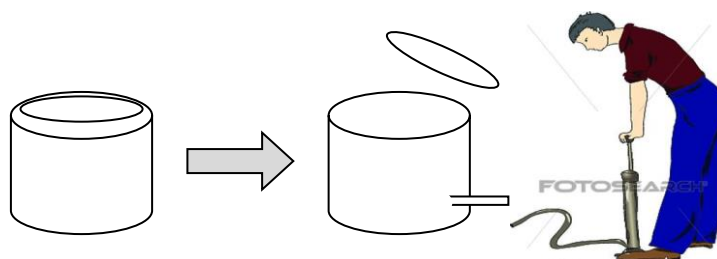
3.2 Consider the picture of a ship sailing on the sea.



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

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

3.3 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)

QUESTION 4

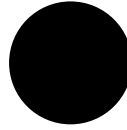
4.1 Atoms of oxygen, hydrogen and carbon are represented by the following symbols:



Oxygen



Hydrogen



Carbon

Use the above symbols to draw the following:

4.1.1 One water molecule (2)

4.1.2 Carbon + oxygen gas \rightarrow carbon dioxide (3)

[5]

TOTAL: [36]

REVISION QUESTION PAPER C**QUESTION 1**

1.1 Four options are given as possible answers to the following questions. Every question has only ONE correct answer. Choose an answer and write down only the letter (A – D) next to the question number (1.1 – 1.5).

1.1.1 Jade wants to test whether the gas produced during an experiment is carbon dioxide gas. Which one of the following reactants can Jade use to test for the presence of carbon dioxide gas?

- A Copper hydroxide.
- B Milky white lime water.
- C Clear lime water.
- D Iodine solution. (1)

1.1.2 Which one of the following symbols represents hydrogen?

- A Hg
- B He
- C Hy
- D H (1)

1.1.3 Protons and neutrons are responsible for the ... of an atom.

- A mass
- B volume
- C density
- D size (1)

1.1.4 Which one of the following is NOT an example of a compound?

- A H₂O
- B O₂
- C CuCl₂
- D CO₂ (1)

1.1.5 Sea-water is an example of a(n) ...

A atom.

B compound.

C mixture.

D element.

(1)

[5]

QUESTION 2

2.1 Choose the description in COLUMN B that best matches the item in COLUMN A. Only write down the letter (A - I) next to the correct question number (2.1.1 – 2.1.5) in your ANSWER BOOK, e.g. 2.1.6 J.

COLUMN A	COLUMN B
2.1.1. Proton	A. Compound
2.1.2. Atom	B. Negatively charged sub-atomic particle
2.1.3. Electron	C. Positively charged sub-atomic particle
2.1.4. Molecule	D. Sub-atomic particle that has no charge
2.1.5. Density	E. Two or more atoms chemically bonded
	F. Smallest building block of matter
	G. Element
	H. Mass per unit volume
	I. Measured in gram per cm ²

(5)

[5]

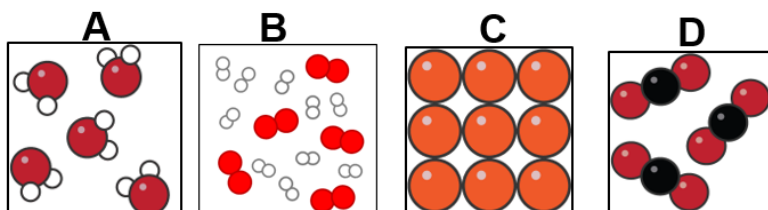
QUESTION 3

3.1 Write down the symbol for each of the following elements:

3.1.1 Oxygen (1)

3.1.2 Nitrogen (1)

3.2 Classify each of the following substances (A, B, C and D) as either a mixture, an element or a compound.



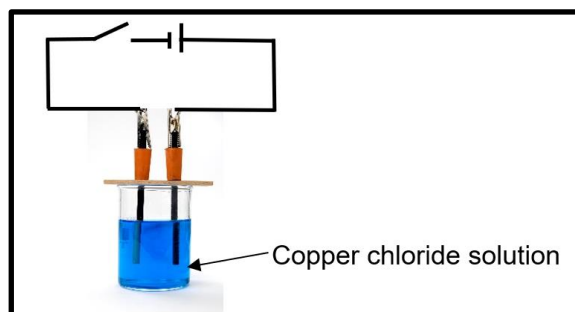
(4)

3.3 Use the particle model of matter to describe the behaviour of water particles when water is heated and changes from a LIQUID to a GAS. In your answer, refer to the kinetic energy of the particles, the movement of the particles, the open spaces between the particles and the forces between the particles. (4)

[10]

QUESTION 4

Phakisi and Tristan want to find out what effect an electric current will have on a blue copper chloride solution. Phakisi predicts that an electric current will break up the copper chloride into copper and chlorine.



4.1 Write down an investigative question for the experiment above. (2)

4.2 Define the term electrolysis. (2)

- 4.3 Describe your observations at the positive electrode (anode). (2)
- 4.4 Write down the formula for chlorine gas. (1)
- 4.5 Describe the energy conversion that occurs during the process above. (2)
- 4.6 Is the blue copper chloride solution an example of an ATOM or a COMPOUND or a MIXTURE? Write down the correct option. (1)

[10]

QUESTION 5

A lady orders a drink in a restaurant. When the waiter brought her drink, she noticed that she could see three different layers of liquids, as shown in the diagram below. Study the diagram and answer the questions that follow.



- 5.1 Define the term density. (2)
- 5.2 Will the density of matter increase or decrease when it is heated? Explain your answer by referring to the definition of density. (2)
- 5.3 Which one of the three layers in the diagram has the highest density? (1)

[5]

TOTAL: [35]

INFORMATION SHEET:

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

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	(I)	(II)										(III)	(IV)	(V)	(VI)	(VII)	(VIII)	
1	H 1																	He 4
3	Li 7	Be 9																Ne 20
11	Na 23	Mg 24																Ar 40
19	K 39	Ca 40	Sc 45	Ti 48	V 51	Cr 52	Mn 55	Fe 56	Co 59	Ni 59	Cu 63,5	Zn 65	Ga 70	Ge 73	As 75	Se 79	Br 80	Kr 84
37	Rb 86	Sr 88	Y 89	Zr 91	Nb 92	Mo 96	Tc 99	Ru 101	Rh 103	Pd 106	Ag 108	Cd 112	In 115	Sn 119	Sb 122	Te 128	I 127	Xe 131
55	Cs 133	Ba 137	La 139	Hf 179	Ta 181	W 184	Re 186	Os 190	Ir 192	Pt 195	Au 197	Hg 201	Tl 204	Pb 207	Bi 209	Po 209	At 210	Rn 222
87	Fr 226	Ra 226	Ac 227															
58	Ce 140	Pr 141	Nd 144	Pm 145	Pu 242	Am 243	Cm 247	Bk 247	Cf 285	Es 287	Fm 287	Md 288	No 289	Lr 260				

KEY/SLEUTEL
Atomic number Atoomgetal
Electronegativity Elektronegatiwiteit
Approximate relative atomic mass Benaderde relatiewe atoommassa

29	Cu	63,5
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