



# education

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Department:  
Education  
North West Provincial Government  
**REPUBLIC OF SOUTH AFRICA**

## PROVINCIAL ASSESSMENT

**GRADE 6**

**NATURAL SCIENCES AND TECHNOLOGY**  
**JUNE 2024**

**MARKS: 60**

**TIME: 1½ hours**

**This question paper consists of 10 pages.**

**INSTRUCTIONS AND INFORMATION**

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers in the SPACES PROVIDED in the question paper.
3. Use a pencil and ruler when drawing diagrams and graphs.
4. Present your answers according to the instructions for each question.
5. Write neatly and legibly.

**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) below to the question numbers.

1.1.1 Matter is defined as ...

- A the ability to convert chemical energy into electricity.
- B anything that takes up space and has mass.
- C moving particles that change shape only when heat is removed.
- D anything that takes space and has regular shape. (1)

1.1.2 Below are the arrangements of particles in different states of matter.

- (i) Particles in a regular pattern
- (ii) Particles are closely packed and with very small spaces in between
- (iii) Particles can move in any direction
- (iv) Particles can take the shape of the container

Which ONE the following particle arrangement represent solid state?

- A (i)
- B (i) and (ii)
- C (ii) and (iv)
- D (i), (iv) and (iii) (1)

1.1.3 Choose ONE statement that is true about mixtures:

- A Mixture is made up of only one substance
- B Water is an example of a mixture
- C Mixture consists of at least two different substances mixed
- D Substances that cannot be separated (1)

1.1.4 One pair of the substances are insoluble and pollute water.

- A soil and air
  - B fertiliser and rain
  - C insecticides and birds
  - D oil and plastics (1)
- [4]**

1.2 Give the correct **scientific term** for each of the following descriptions.  
Write only the term in the space provided.

1.2.1 A mixture of a solid that dissolves in a liquid.

\_\_\_\_\_

1.2.2 A flat piece of land that is covered by shallow pools of water and act as sponges.

\_\_\_\_\_

1.2.3 A method of separating, where small particles of sand are removed by using a cloth or filter.

\_\_\_\_\_

1.2.4 The liquid in which the solid(solute) dissolves.

\_\_\_\_\_

1.2.5 Introduction of waste/harmful material into the environment through human activities.

\_\_\_\_\_

[5]

1.3 Indicate whether each of the statements in COLUMN I applies to **A ONLY**, **B ONLY**, **BOTH A AND B** or **NONE** of the items in COLUMN II.  
Write **A only**, **B only**, **both A and B** or **none** in COLUMN III.

COLUMN I	COLUMN II	COLUMN III
1.3.1 Different solids that cannot dissolve in water	A: nail, copper B: sand, marble	
1.3.2 A method used to separate a mixture like peanuts & raisins	A: hand sorting B: melting	
1.3.3 Wetlands are important because they ...	A: act as a sponge during heavy rains. B: forms pollutants	

(3 x 2) [6]

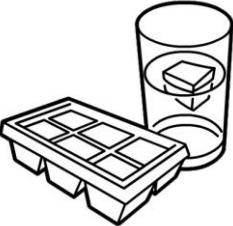

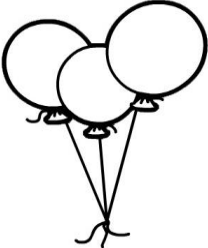
**TOTAL SECTION A: 15**

**SECTION B**

**QUESTION 2**

2.1 The diagram below in **Figure 1** has pictures **A**, **B** and **C** that represent three (3) states of matter.

2.1.1 Draw the arrangements of the particles in COLUMN 3 provided that represents the state of the 3 pictures **A**, **B** and **C**.

COLUMN 1 Pictures	COLUMN 2 Material inside	COLUMN 3 Arrangement of particles
 <p><b>A</b></p>	Ice blocks	
 <p><b>B</b></p>	Water	
 <p><b>C</b></p>	Air	

**Figure 1 States of matter**

(6)

- 2.2 The table below shows different materials used by a group of learners to make the mixtures.

Mixture	Method of separation
1. Peanuts and beans	a)
2. Water and oil	b)
3. Salt and water	c)

- 2.2.1 Suggest the correct method of separation and write the correct answer in the table above (a–c). (3)

- 2.2.2 From the mixtures in the table above, choose a mixture that can be suitable to investigate the process of crystallisation. Give a reason for your answer.

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(2)

- 2.2.3 Solids like sugar dissolves in water because they are soluble therefore, solids like metals will not dissolve in water because they are

... \_\_\_\_\_

(1)  
[12]

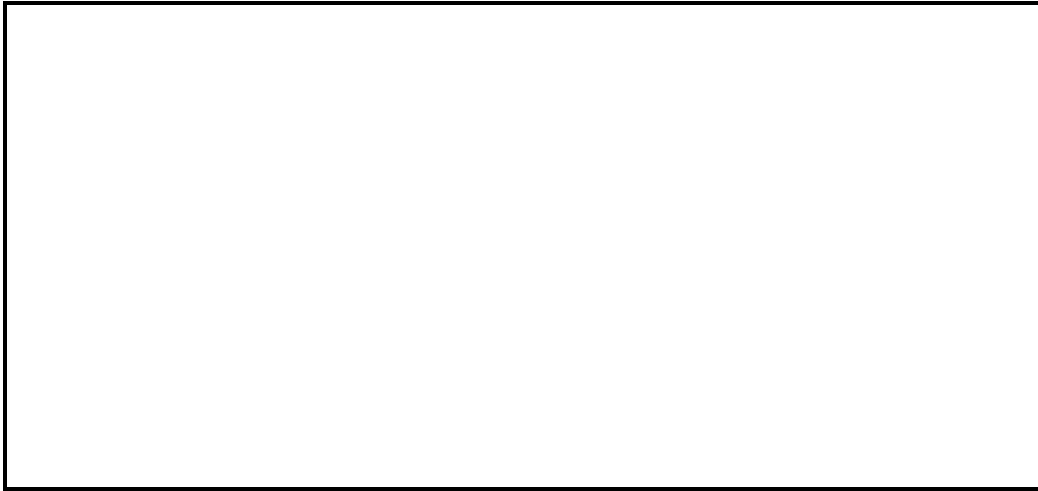
### QUESTION 3

- 3.1 The investigation below show how stirring affects the rate of dissolving.

Learners in Boitseanape Technical school conducted an investigation on how stirring affects the rate of dissolving at room temperature. Two (2) beakers were used and same amount and size of grain of sugar was used for both beakers. The results were recorded in a table that shows both beakers. The mixture in beaker one was stirred and the mixture in beaker two was not stirred.

	Time for sugar to dissolve (in seconds)
No stirring (beaker 1)	50
With stirring (beaker 2)	30

- 3.1.1 Draw a bar graph showing the effect of stirring on rate of dissolving using the results recorded in the table above. Your graph should have a heading, show your y- & x-axis and also use correct space/scaling.



(4)

- 3.1.2 Name the TWO factors that were kept constant/not changed to ensure fair test in the investigation.

a) \_\_\_\_\_

b) \_\_\_\_\_

(2)  
[6]

#### QUESTION 4

- 4.1 Read the passage below and answer the questions that follow.

The Hartebeespoort Dam is one of the oldest tourist attractions in the country. It was built in 1920s to supply water to farms near the town of Brits. It serves as habitat for many animals like frog, fish and other aquatic insects that breed there and permanently stay in the dam. Today it is heavily polluted. Water from the mines as well as waste from the factories near Johannesburg flow down the Crocodile River into the dam. Fertilisers from the farms upstream have caused algae growth in the dam. Human wastes from the townships of the West Rand also pollute the water.

- 4.1.1 State ONE reason why the dam was built.

\_\_\_\_\_

\_\_\_\_\_

(1)

- 4.1.2 List THREE sources of pollution affecting the dam.  
a) \_\_\_\_\_  
b) \_\_\_\_\_  
c) \_\_\_\_\_ (3)
- 4.1.3 Indicate where do the fertilisers come from in Hartebeespoort Dam?  
\_\_\_\_\_ (1)
- 4.1.4 Fertiliser causes algae to grow. Explain why does this cause a problem?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ (2)
- 4.2 Wetlands are regarded as a centre of biodiversity in South Africa.
- 4.2.1 Explain with TWO factors why wetlands are important for biodiversity  
a) \_\_\_\_\_  
\_\_\_\_\_ (2)  
b) \_\_\_\_\_  
\_\_\_\_\_ (2)
- 4.2.2 Name TWO animals that uses wetlands as their habitats  
a) \_\_\_\_\_  
b) \_\_\_\_\_ (2)
- [13]**



**QUESTION 5**

5.1 Read and analyse the warning sign below and answer the questions that follow.



Figure 2: *warning against drinking polluted water*

5.1.1 State a reason why the warning sign was put in that area.

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(2)

5.1.2 Name TWO human diseases caused by drinking contaminated water.

a) \_\_\_\_\_

b) \_\_\_\_\_

(2)

5.2 Filtering and chlorination are part of the stages in water treatment in all municipalities that clean water for re-use.

5.2.1 Explain the importance of the TWO stages in the purification process.

a) \_\_\_\_\_

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(2)

b) \_\_\_\_\_

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(2)

5.2.2 Sieving is a process to clean water. Explain why it is not safe to drink water after sieving?

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(2)

5.3. Most rural areas still depend on river water and dam water in South Africa. Families are using the boiling method to ensure that water is safe for consumption.

5.3.1 Outline the FOUR steps that can be followed to clean the water by filtering and boiling processes.

- a) \_\_\_\_\_ (1)
- b) \_\_\_\_\_ (1)
- c) \_\_\_\_\_ (1)
- d) \_\_\_\_\_ (1)
- [14]**

**TOTAL SECTION B: 45**  
**GRAND TOTAL: 60**