

MARKER CODE			



STUDENT ENROLMENT NUMBER (SEN)									

SECONDARY ENTRANCE EXAMINATION

2023

SCIENCE

QUESTION AND ANSWER BOOKLET

Time Allowed: 2 Hours + 10 minutes reading

INSTRUCTIONS

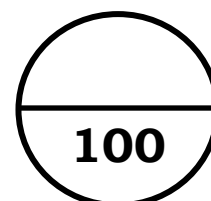
1. This paper has **FOUR SECTIONS**. ALL Sections are **COMPULSORY**.

SECTION	STRANDS	MARKS
ONE	LIVING WORLD	35
TWO	PHYSICAL WORLD	25
THREE	MATERIAL WORLD	20
FOUR	PLANET EARTH and BEYOND	20
TOTAL MARKS		100

2. Write your **Student Enrolment Number (SEN)** on the top right-hand corner of this page and on page 27.
3. Answer **ALL** questions in the spaces provided.
4. Use a black or blue ball point pen for your written answer. Use a pencil **ONLY** for drawings.
5. Write legibly and work neatly.
6. Check that this booklet contain pages **2-27** in the correct order and that pages 25 - 26 have been deliberately left blank.
7. If you need more papers for answers, ask the supervisor for extra paper. Write your **Student Enrolment Number (SEN)** on the extra paper(s).

YOU MUST HAND IN THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

TOTAL MARKS



QUESTION 1: CELL THEORY AND MICRO-ORGANISMS

PART A: Multiple choice

Circle the letter of the **BEST** answer.

1. Which statement below correctly defines **ecosystem**?

- A. Plants and animals living in a large environment.
- B. Physical factors that influence animals found in an area.
- C. Plants in an area and the physical factors that influence them.
- D. Plants and animals in an area and the interaction between them.

Skill level 1	
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2. A disease-causing micro-organism is termed

- A. bacteria.
- B. pathogen.
- C. pollutant.
- D. virus.

Skill level 1	
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3. The table below shows descriptions of visible characteristics of vertebrates **G**, **H** and **I**.

Vertebrate	Visible characteristics
G	Smooth, moist skin
H	Streamlined body with fins
I	Dry scaly skin

Which statement gives the correct class named vertebrate?

	G	H	I
A	fish	reptile	amphibian
B	amphibian	reptile	fish
C	reptile	amphibian	fish
D	amphibian	fish	reptile

Skill level 1	
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1. The pictures below show cells from an onion and from the human cheek.



C

- Cell membrane** is present in both cells shown above.

Skill level 1	
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Skill level 2	
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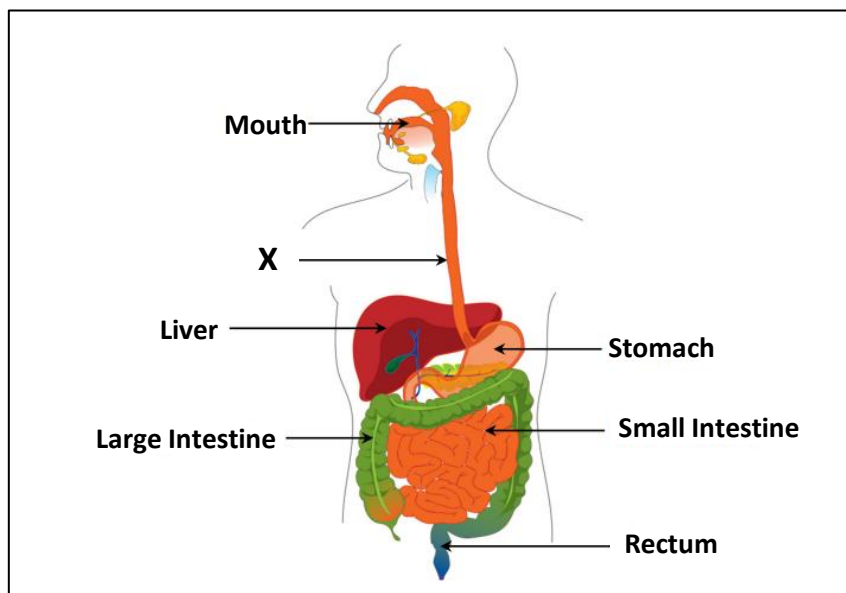
2. Epidemics such as COVID 19 can kill people very quickly. This is because the virus can multiply very quickly. Also they only survive inside living things.

Describe one way human can do to prevent a viral infection.

Skill level 2	
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3. Digestive System and associated health issues

The diagram below shows the human digestive system.



- a. On the diagram, draw a **circle** around a part of the digestive system which also a part of the respiratory system.

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- b. Name structure X.

Skill level 1	
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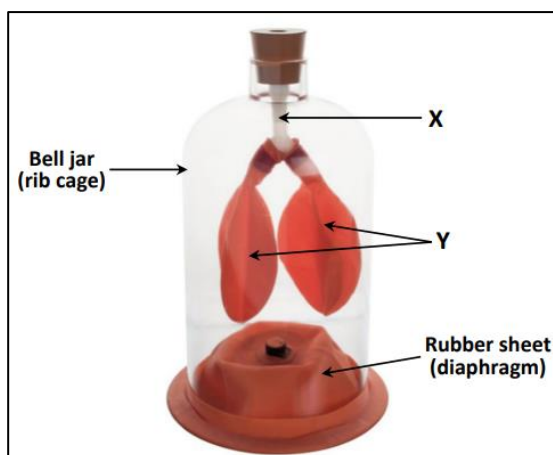
- c. Complete the table below by matching the part of the digestive system from the diagram with its function.

Function	Part of the digestive system
Absorbs water from fully-digested matter	
Secretes hydrochloric acid to kill bacteria in food	

Skill level 2	
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PART B: Respiratory System and associated health issues

1. The picture below shows a laboratory model of the human breathing system.



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- a. Name the part of the breathing system represented by the balloons tube Y

- b. Describe what happens to the diaphragm, and rib cage during the process of inhalation.

Skill level 2	
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Asthma is one of the diseases of the respiratory system.

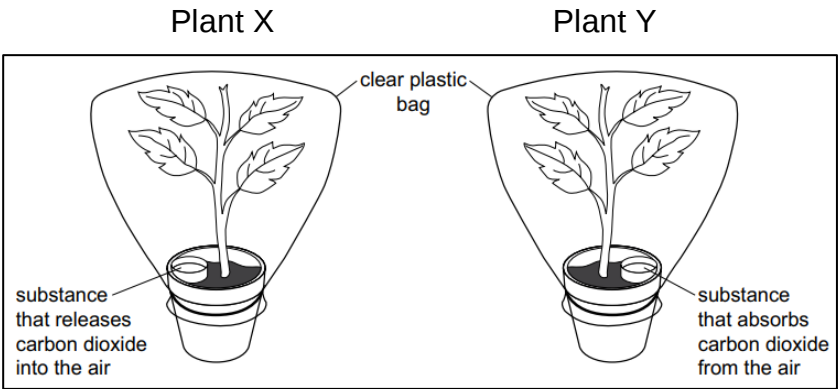
- c. Explain the symptoms of asthma and the preventative method taken by an infected person.

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QUESTION 2: PLANTS AND ANIMALS

1. A student investigates **photosynthesis** using the set-up shown in the diagram below.

The student placed the plants in the same warm room with plenty of light.



After three days, the student uses iodine solution to test a leaf from each plant.

The diagram below shows the results:



Complete the sentences to explain the results above.

The colour of the iodine solution shows that only the leaf from plant X contain _____.

This investigation shows that photosynthesis requires the presence of _____.

Skill level 1	
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Skill level 1	
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2. A student tests some potato with Benedict's solution by following the procedure shown below.

Step 1. Put piece of potato in a test- tube
 Step 2. Add 2cm^3 Benedict's solution.
 Step 3. Shake the test-tube to mix.
 Step 4.
 Step 5. Observe the colour after 3 minutes

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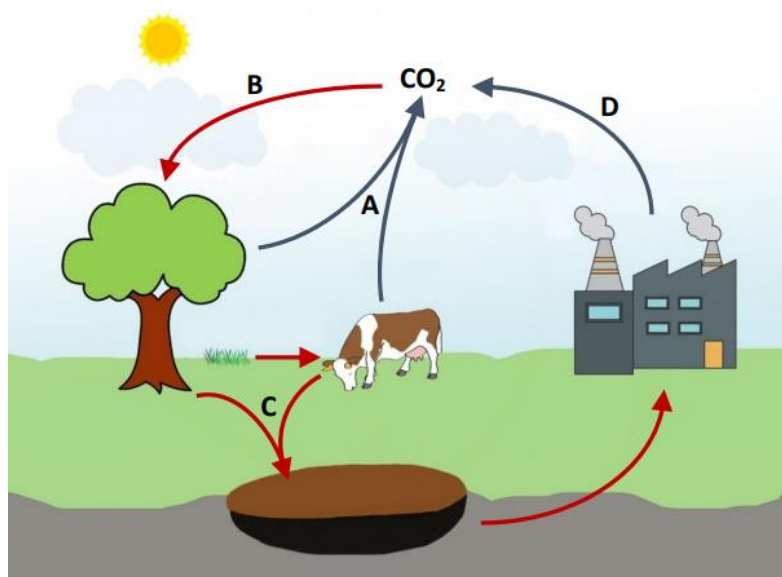
- a. State the instruction for step 4.

- b. Describe the observation made for a positive results.

Skill level 2	
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3. The diagram below shows part of the **carbon cycle**.

It shows how carbon moves into and out of the air and soil.



- a. During **process A**, plants and animals release carbon dioxide into the air.

Name process A.

Skill level 1	
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- b. Describe the function of the green pigment found in plants which allow **Process B** to happen.

Skill level 2	
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- c. Describe how plants and animals add carbon into the soil in **Process C**.

Skill level 2	
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Process D shows the burning of fossil fuels, which releases carbon dioxide into the air. Carbon dioxide is often referred to as a greenhouse gas.

- d. Discuss one environmental concerns associated with an increase in the level of carbon dioxide in our atmosphere.

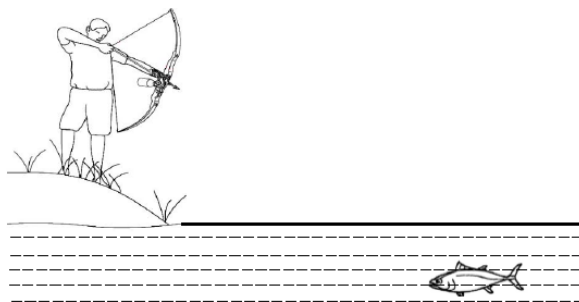
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Part A: Multiple Choice Questions

Circle the letter of the **BEST** answer.

1. The diagram below shows a **fish in a pond**.

The student aims at shooting the fish as he sees it in the pond.



Why is it most likely that the student will miss the fish?

- A. Light from the student is reflected away from the fish.
- B. Light from the fish is refracted as it leaves the pond.
- C. Light from the fish is reflected away from the student.
- D. Light from the student is refracted as it enters the pond.

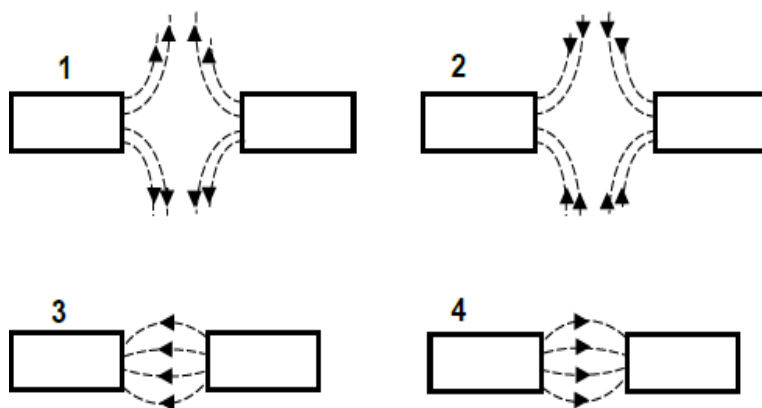
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2. Heat can be transferred through solids, liquids and gases. Which of the following explanation is correct?

	Conduction of heat	Convection of heat
A	can happen in a solid	can happen in a solid
B	can happen in a solid	only happens in liquids and gases
C	only happens in liquids and gases	can happen in a solid
D	only happens in liquids and gases	only happens in liquids and gases

Skill level 1	
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3. The diagrams show magnetic field lines between two magnet poles



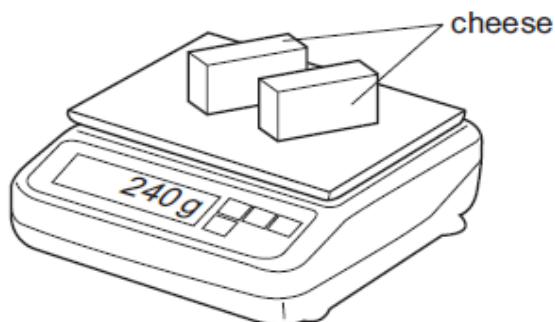
Which diagrams show two poles repelling each other?

- A. 1 and 2 only.
- B. 1 and 3 only.
- C. 3 and 4 only.
- D. 1 and 4 only.

Skill level 1	
1	
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Part B: Extended Answers.

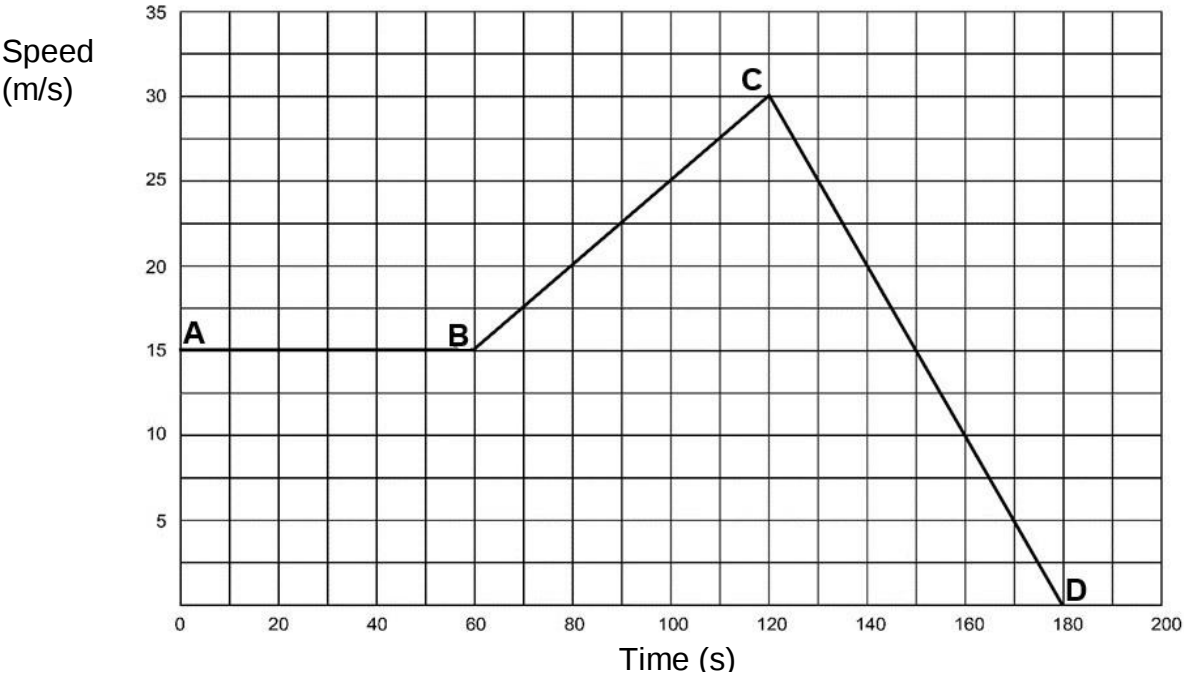
1. A shopkeeper places two identical blocks of cheese on a balance.
- Each block measures 2.0cm x 5.0cm x10.0cm.



- a. Calculate the density of the cheese.

Skill level 2	
2	
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2. The graph below shows how the speed of a car changed with time during a journey.



a. State the maximum speed of the car during this journey.

b. Describe the motion of the car between positions C and D.

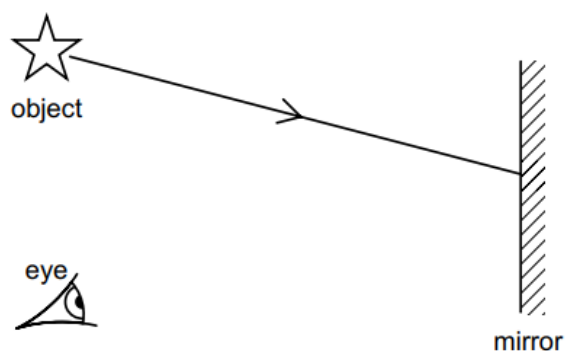
c. Calculate the acceleration of the car between positions B and C.

Skill level 1	
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Skill level 2	
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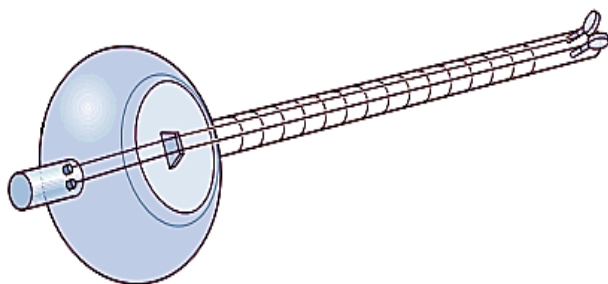
3. The diagram below shows a person's eye looking at the reflection of an object placed in front of an aluminium mirror.



Skill level 2	
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Complete the diagram to show how the eye is able to see the **reflected image** of the object.

4. A dotar is a musical instrument with two strings.



- a. Sione makes the strings tighter so they vibrate more quickly.

How does this affect the sound produced by the strings? Tick the correct box.

The sound has a lower pitch

☐

The sound is louder

☐

The sound has a higher pitch

☐

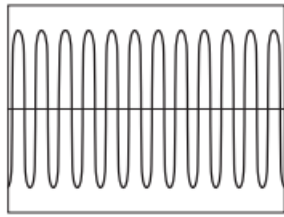
The sound is quieter

☐

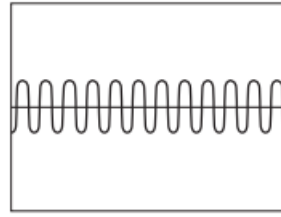
Skill level 1	
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- b. Sione played the dotar near a microphone.

The diagrams below show the patterns made by two sounds, A and B.



A



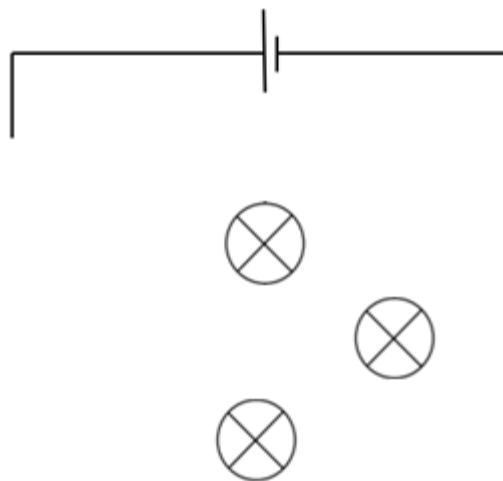
B

Compare the sound shown in A with the sound shown in B.

[illegible]

Skill level 3	
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5. The diagram below shows an incomplete circuit, made of 3 bulbs and 1 battery.



Skill level 1	
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- a. Complete the diagram above to connect the bulbs in parallel.

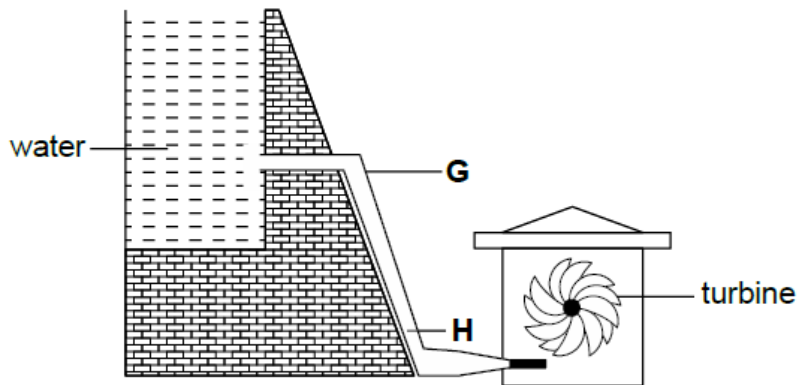
- b. Draw in a switch to the circuit above so that it be able to turn all the 3 bulbs on and off at the same time.

Skill level 1	
1	
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6. The diagram below shows a **hydro-electric power** station.

The water is allowed to fall from point **G** to point **H**.

The total energy at point **G** is equal to the total energy at point **H**



- a. State the main energy conversions that take place as the water moves from point **G** to point **H**.

Skill level 2	
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- b. Discuss why the energy of the water at point **G** is equal to the energy of the water at point **H**.

Skill level 4	
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Part A: Multiple Choice

Circle the **letter** of the best answer.

1. Which of the following is the symbol of the element **chlorine**?

- A. CL
- B. Cr
- C. Cl
- D. Cn

Skill level 1	
1	
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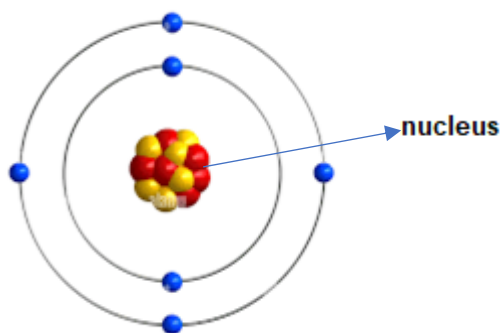
2. The melting point of element X is 25°C. The boiling point of the same element is 70°C. At 30°C the element is a _____

- A. solid.
- B. liquid.
- C. gas.
- D. vapour.

Skill level 1	
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Part B: Extended Answers.

1. An atom of an unknown element is shown in the diagram below.



a. Name **ONE (1)** subatomic particle found in the nucleus of an atom.

Skill level 1	
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- b. Name the unknown element and locate its position on the Periodic Table shown below.

Skill level 2	
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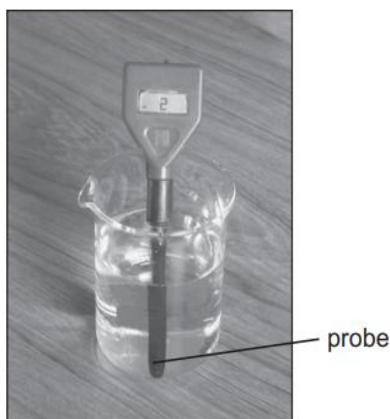
2. Magnesium is in the **same group** as Calcium in the Periodic table.

Discuss in terms of their atomic structure why these two elements are placed in the same group.

[illegible]

Skill level 4	
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3. Molly used a pH sensor to test different liquids. She dipped the probe of the sensor into each liquid and recorded the pH value in a table.



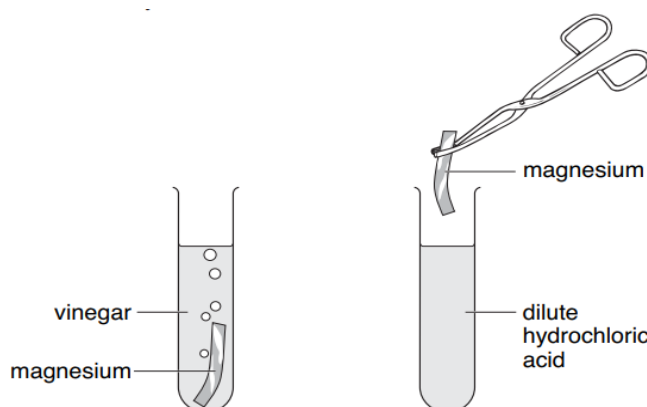
liquid	pH value
alcohol	7
dilute hydrochloric acid	2
distilled water	7
vinegar	3
sodium hydroxide solution	11

Between each test she dipped the probe into distilled water.

- a. State which other liquid could student used between tests to have the same effect as distilled water.

Skill level 1	
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Molly set up two test-tubes with equal amounts of acids were set-up. Magnesium ribbon with some length were added to each test-tube as shown in the diagram below.



Molly thought that magnesium would react more vigorously with hydrochloric acid than with vinegar.

- b. Describe what information in the table above supports her thought.

Skill level 2	
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4. Iron reacts with dilute hydrochloric acid to form hydrogen gas and a salt.

a. Explain why the above sentence is an example of a **chemical change**.

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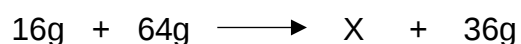
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Iron is used as a **catalyst** in some chemical reactions

b. Describe what is meant by catalyst.

Skill level 2	
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5. When 16g of methane gas is burned in 64g of oxygen, water and carbon dioxide are formed. The mass of the water produced is 36g. (Equation is not balanced).



a. **State** much carbon dioxide is made?

Skill level 1	
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- b. **Describe** how does the above chemical reaction accounts for the *Law of Conservation of mass*.

Skill level 2	
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Part A: Multiple choice

Circle the letter of the best answer.

1. The type of volcano that has been inactive for many years but has the potential to erupt again is
- A. Extinct volcano.

B. Active volcano.

C. Dormant volcano.

D. Inactive volcano.

Skill level 1	
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2. The point on Earth’s surface directly above where an earthquake originates is the
- A. focus.

B. fault.

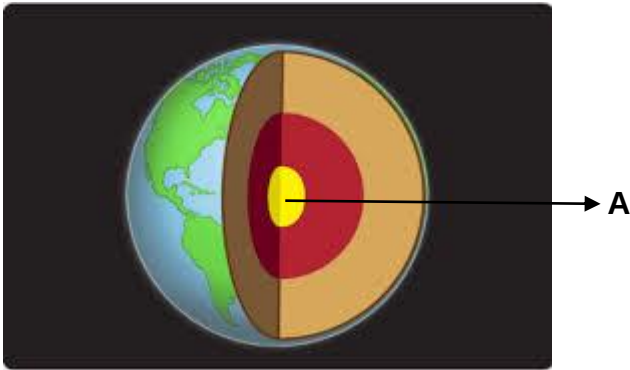
C. epicenter.

D. inner core.

Skill level 1	
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Part B: Extended Answers

1. The diagram below shows the structure of the Earth.



- a. State the name of the part labelled A in the diagram above.
-

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- [illegible]

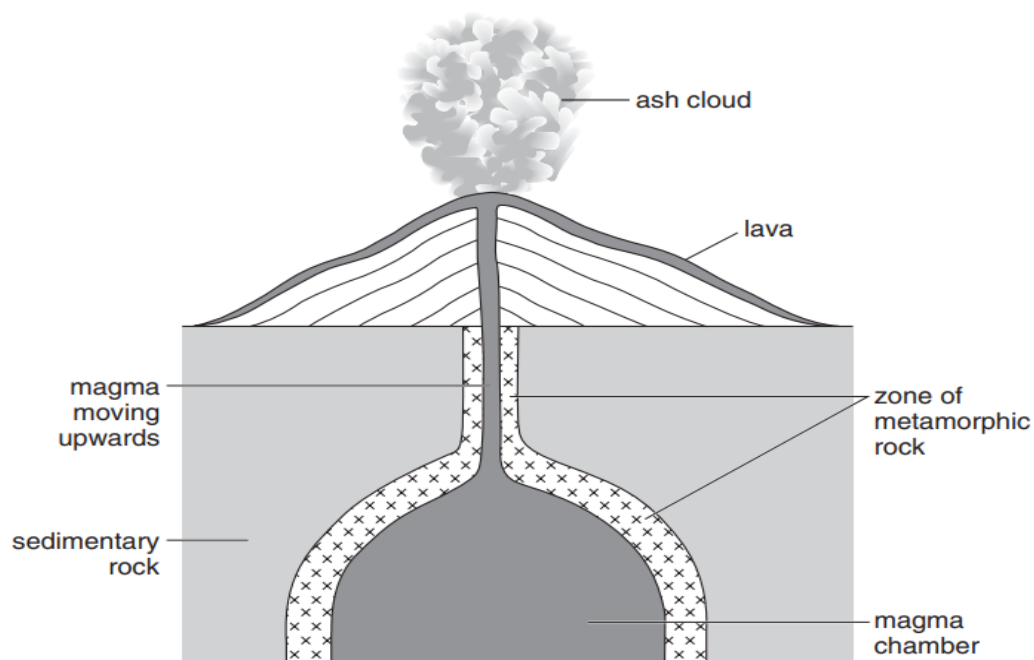
Although water is one of the natural **renewable** resources, we are advised to use it wisely at all times.

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3. The diagram below shows a section through a volcano.

A zone of rock surrounding the magma has become a metamorphic rock.



a. Describe how solid rocks form when a volcano erupts.

Skill level 2	
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b. Describe the conditions that would cause the above statement to happen.

Skill level 2	
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- c. State the name of the metamorphic rock which is formed from limestone in this way.

Skill level 1	
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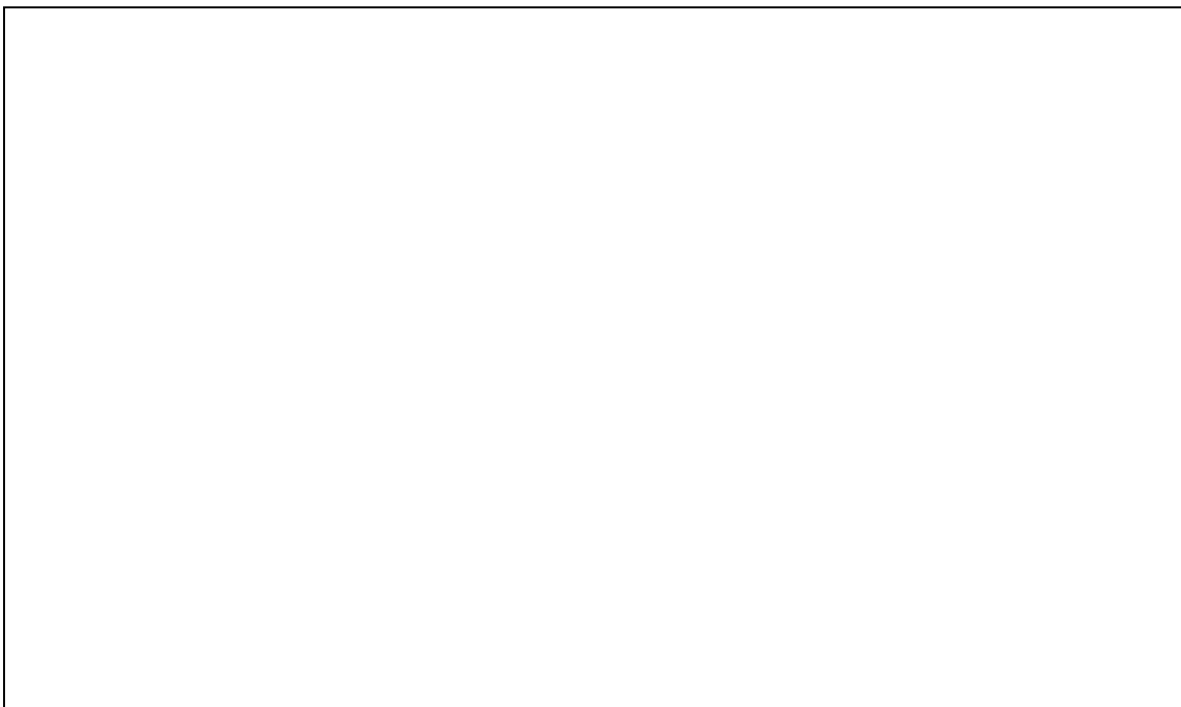
4. **Fill in the blanks** in the paragraph below using the words in the box. You can use the words once, more than once or not at all.

Venus Jupiter Earth Sun ring gaseous rocky Mars

The first four planets in our solar system are _____ planets. _____ is called the red planet while _____ is the giant planet. Mercury is the closest planet to the sun while _____ is the hottest.

Skill level 2	
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5. In the space below, draw a diagram to show how a lunar eclipse occurs. Draw straight lines to show the light rays.



Skill level 3	
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- a. State the phase of the moon when lunar eclipse occurs.

Skill level 1	
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STUDENT ENROLMENT NUMBER (SEN)									

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2023

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