

# Cambridge Lower Secondary Checkpoint

CANDIDATE  
NAME

CENTRE  
NUMBER

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CANDIDATE  
NUMBER

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## SCIENCE

**0893/01**

## Paper 1

**April 2023**

**45 minutes**

You must answer on the question paper.

No additional materials are needed.

## INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should show all your working in the booklet.
- You may use a calculator.

## INFORMATION

- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **20** pages. Any blank pages are indicated.

1 This question is about the human excretory (renal) system.



(a) Complete these sentences about the structure and function of the excretory (renal) system.

The excretory (renal) system filters blood.

Blood enters the ..... where it is filtered, and urine is formed.

This urine passes along a tube called the ..... towards the bladder.

The urine is stored in the bladder.

Urine is released from the body through a different tube called the .....

[3]

(b) The table shows the percentage concentration of four substances in blood plasma and in urine.

substance	percentage concentration of substance	
	in blood plasma	in urine
ammonia	0.00	0.05
protein	9.00	0.00
salt	0.60	0.90
urea	0.03	2.00

Which substance has the **greatest increase** in the urine compared to blood plasma?

Choose from the list.

ammonia

protein

salt

urea

..... [1]

2 Aiko calculates the density of some objects.



(a) A block of iron has a mass of 19.68 g.

The volume of the block is  $2.50 \text{ cm}^3$ .

(i) Write down the equation Aiko uses to calculate density.

density = ..... [1]

(ii) Calculate the density of Aiko's block of iron.

density = .....  $\text{g/cm}^3$  [1]

(b) Aiko calculates the density of four objects.

Look at her results.

object	density in $\text{g/cm}^3$
A	2.7
B	8.4
C	0.002
D	13.6

Which object is a gas?

Circle the correct answer.

**A**

**B**

**C**

**D**

Explain your answer.

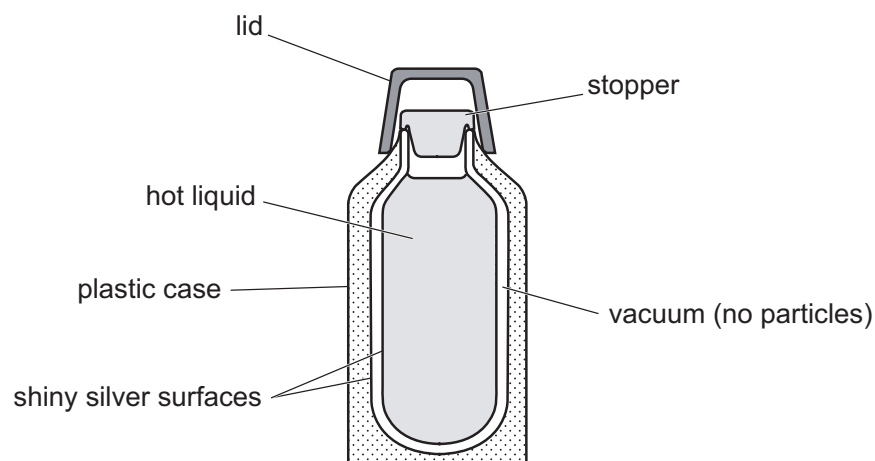
..... [1]

3 Look at the diagram of a vacuum flask.



Gabriella puts a hot liquid into the vacuum flask.

The flask keeps the hot liquid warm.



(a) Which material is most suitable to make the stopper?

Circle the correct answer.

**copper**

**gold**

**iron**

**plastic**

[1]

(b) (i) Suggest how the shiny silver surfaces help to keep the liquid warm.

..... [1]

(ii) The vacuum does **not** contain any particles.

Explain why the vacuum reduces the transfer of thermal energy.

.....  
 .....  
 ..... [2]

- (c) Gabriella removes the lid and the stopper from the vacuum flask.

Some of the hot liquid evaporates.

What happens to the temperature of the liquid that remains in the vacuum flask?

Explain why.

Use ideas about particles.

.....

.....

..... [3]

- 4 The Earth's crust is made of a number of large pieces.



- (a) What is the name given to these pieces of the Earth's crust?

Circle the correct answer.

**earthquake**

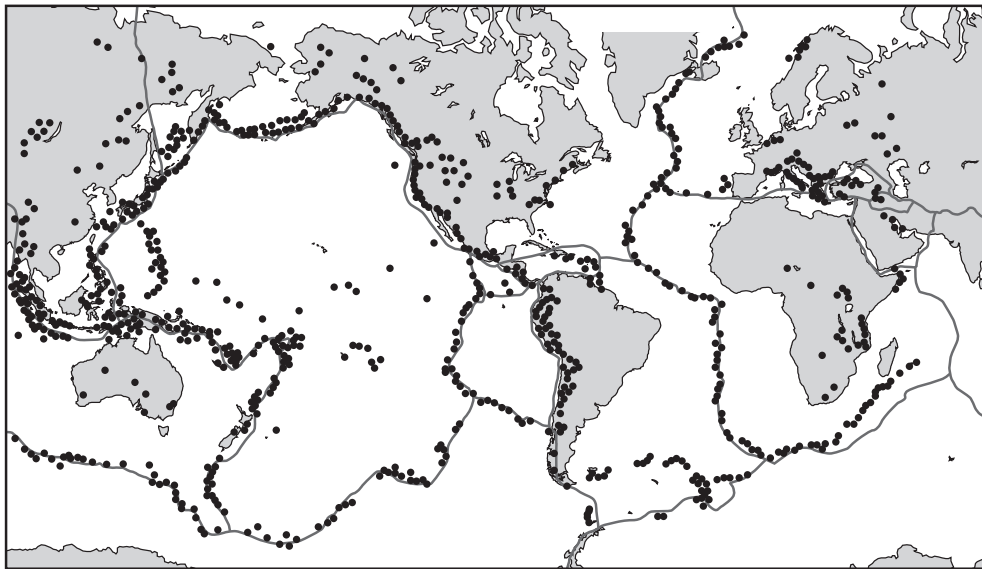
**inner core**

**mantle**

**tectonic plates**

[1]

- (b) Look at the map showing the positions of earthquakes around the world in 2021.



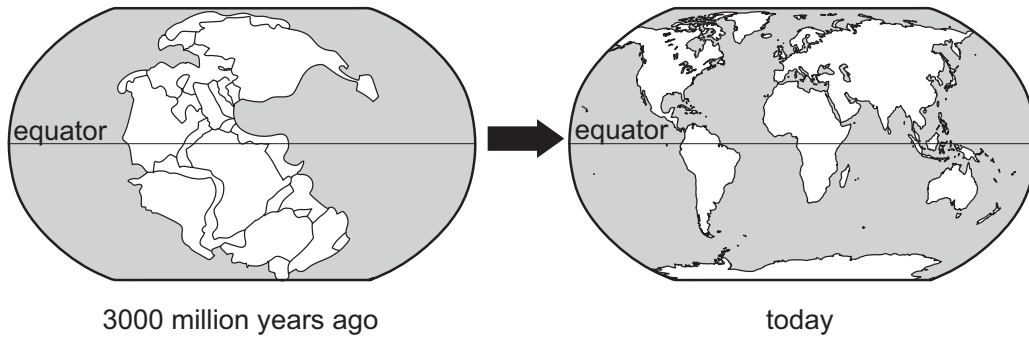
• earthquake

Suggest how the position of earthquakes provides evidence for the large pieces of the crust.

.....

..... [1]

(c) Look at the two maps showing the jigsaw appearance of the continental coasts.



(i) What is meant by the **jigsaw appearance** of the continental coasts?

.....  
 ..... [1]

(ii) The continents have moved since 3000 million years ago.

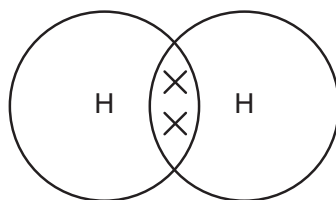
Explain how the continents move.

.....  
 .....  
 ..... [2]

- 5 The diagram shows a model of a hydrogen molecule.



X = electron



- (a) Name the **type** of bonding in a hydrogen molecule.

.....

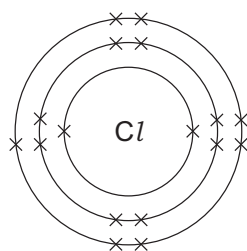
Explain how you can tell from the diagram.

.....

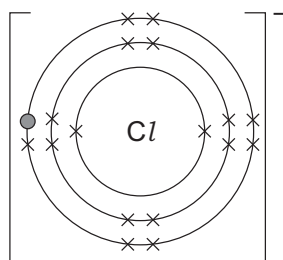
.....

[2]

- (b) Look at the diagrams showing a chlorine atom and a chloride ion.



chlorine atom,  $Cl$



chloride ion,  $Cl^-$

Describe how a chloride ion is made from a chlorine atom.

.....

[1]

- (c) Sodium chloride,  $NaCl$ , is made up of sodium ions,  $Na^+$ , and chloride ions,  $Cl^-$ .

Explain how the ions in sodium chloride are held together.

.....

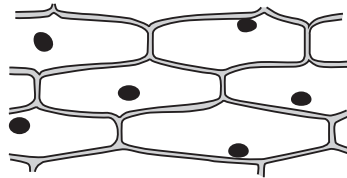
.....

[1]

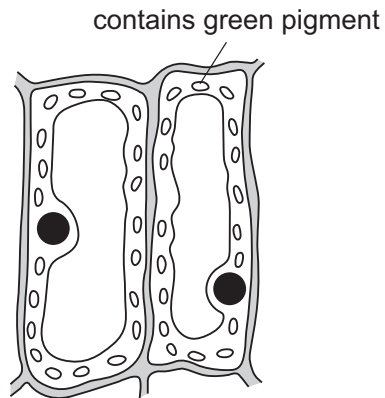
6 This is a question about photosynthesis and plant minerals.



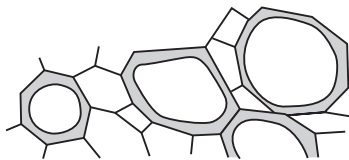
(a) Look at the diagrams of different plant cells.



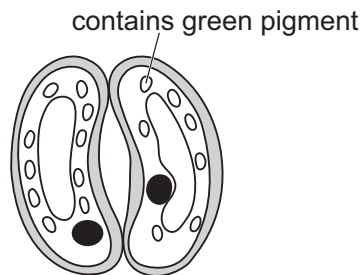
**A** onion epidermal cells



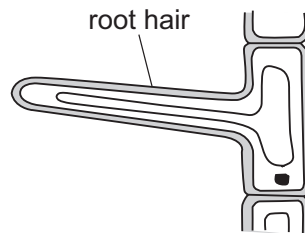
**B** palisade cells



**C** cells found in xylem



**D** guard cells



**E** epidermal cell in the root

Which **two** diagrams show plant cells that photosynthesise?

Choose from **A**, **B**, **C**, **D** and **E**.

..... and .....

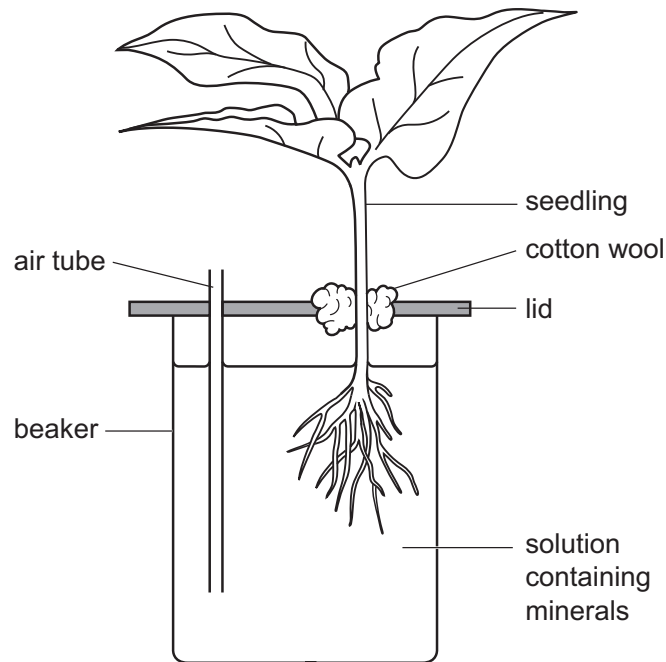
[2]



(b) Carlos investigates the effect of magnesium on plant growth.

Carlos makes a hypothesis about the effect of magnesium on plant growth.

He uses the equipment in the diagram.



In his first experiment Carlos:

- fills a beaker with a solution containing all the minerals needed for healthy growth
- assembles the equipment and seedling as shown in the diagram
- records the appearance of the seedling after four weeks.

Carlos repeats the experiment.

In his second experiment, he uses a solution that contains all the minerals needed for healthy growth **except** magnesium.

(i) Carlos makes a hypothesis about the effect of magnesium on plant growth.

Suggest a suitable hypothesis.

.....

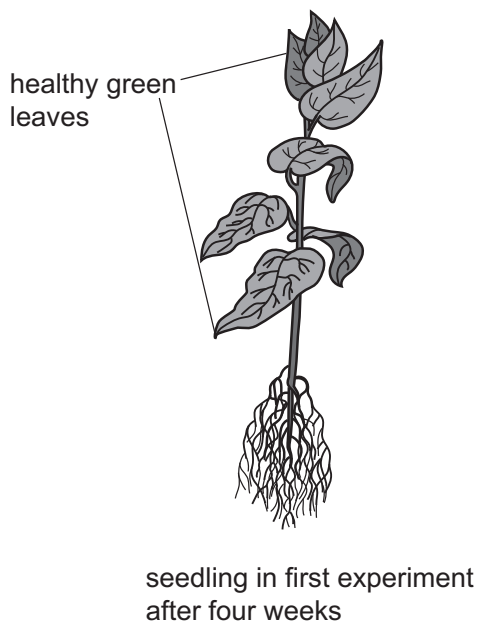
..... [1]

- (ii) In his first experiment, Carlos uses a solution with all the minerals needed for healthy growth.

Explain why this is important.

.....  
 ..... [1]

- (c) Carlos draws a diagram to show the appearance of the plant from the first experiment after four weeks.



Carlos repeats his experiment again.

In his third experiment, he uses a solution that contains all the minerals needed for healthy growth **except** nitrates.

Predict the appearance of the seedling left in the solution **without** nitrates after four weeks.

Give a reason for your answer.

.....  
 .....  
 ..... [2]

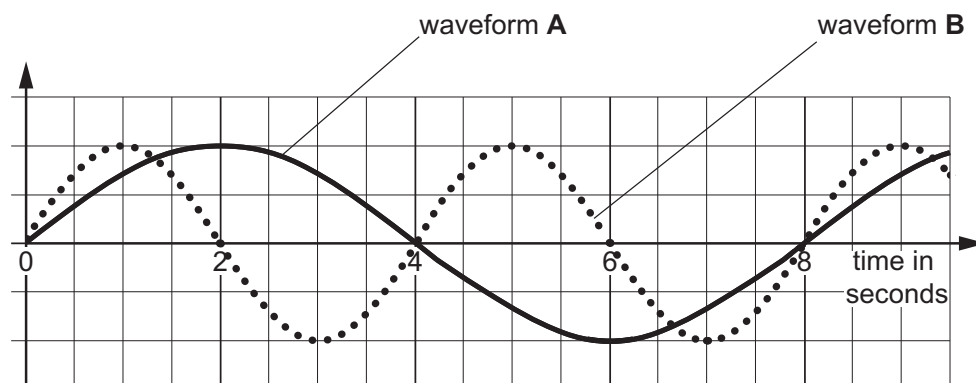
- (d) Which substance is made inside chloroplasts?

..... [1]

7 Ahmed hears two sounds, **A** and **B**.



Look at the waveforms for these two sounds.



Give **one similarity** and **one difference** between waveform **A** and waveform **B**.

similarity .....

difference .....

[2]

8 When asteroids collide with the Earth, they make craters.



Chen uses a model to investigate the effect of asteroid collisions with the Earth.

In his investigation Chen:

- drops a rock into a container of soil
- measures the size of the hole in the soil made by the rock.

(a) Complete the sentences about Chen's model.

In the model the rock represents .....

In the model the soil represents .....

In the model the hole represents .....

[2]

(b) Write down **one strength** and **one limitation** of his model of asteroid collisions with the Earth.

strength .....

limitation .....

[2]

9 Myxomatosis is a disease that kills rabbits.

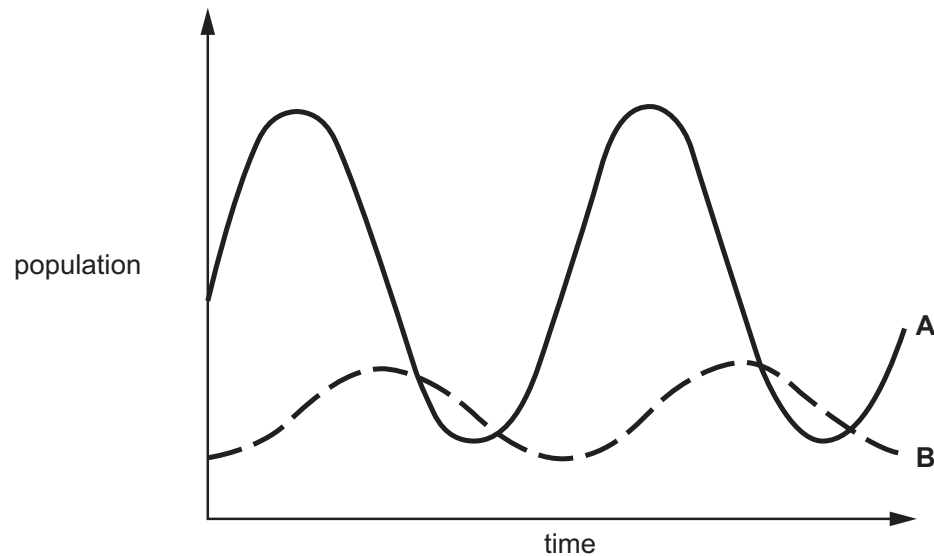


(a) Describe the effect of myxomatosis on the size of a rabbit population.

..... [1]

(b) Foxes hunt rabbits for food.

The graph shows the population of foxes and the population of rabbits.



Tick (✓) the box that shows the population of rabbits.

line A

☐

line B

☐

Give **two** reasons for your answer.

1 .....

.....

2 .....

.....

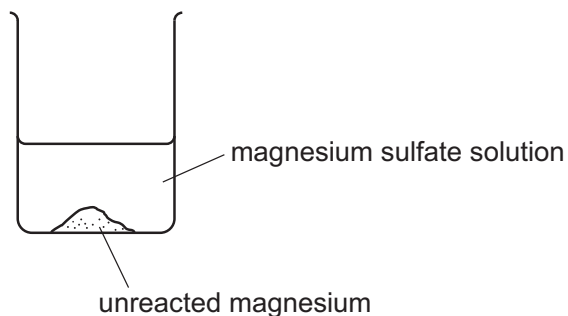
[2]

10 Blessy makes some magnesium sulfate.



She adds an excess of magnesium to some dilute sulfuric acid until the reaction stops.

Unreacted magnesium is left at the bottom of the solution.



(a) Describe how Blessy separates the magnesium sulfate solution from the unreacted magnesium.

..... [1]

(b) Blessy wants to make solid magnesium sulfate from the magnesium sulfate solution.

Describe how she makes solid magnesium sulfate.

.....  
..... [1]

(c) Blessy now wants to make zinc chloride.

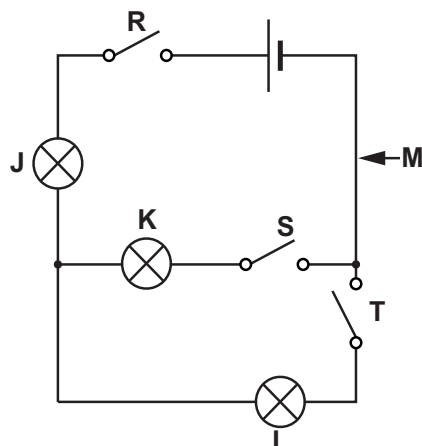
Write down the name of the **metal** and **acid** she uses to make zinc chloride.

metal .....

acid .....

[1]

11 The circuit diagram shows the circuit Priya makes using switches and identical lamps.



(a) Priya connects a meter to measure the current at position **M** in the circuit.

Draw the correct symbol for the meter she uses to measure the current.

..... [1]

(b) Priya opens and closes different switches.

Complete the table by writing if the:

- switches are **open** or **closed**
- lamps are **on** or **off**.

switch R	switch S	switch T	lamp J	lamp K	lamp L
closed	open	open	off	.....	.....
open	closed	closed	.....	off	.....
.....	.....	.....	on	off	on

[3]

(c) Describe how Priya connects a voltmeter to measure the voltage across lamp **J**.

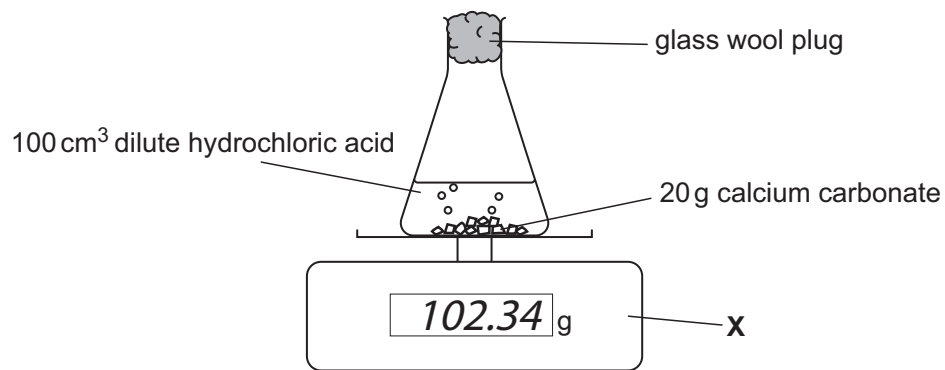
..... [1]

12 Pierre investigates the reaction between calcium carbonate and dilute hydrochloric acid.



The reaction gives off carbon dioxide gas.

Look at the equipment he uses.

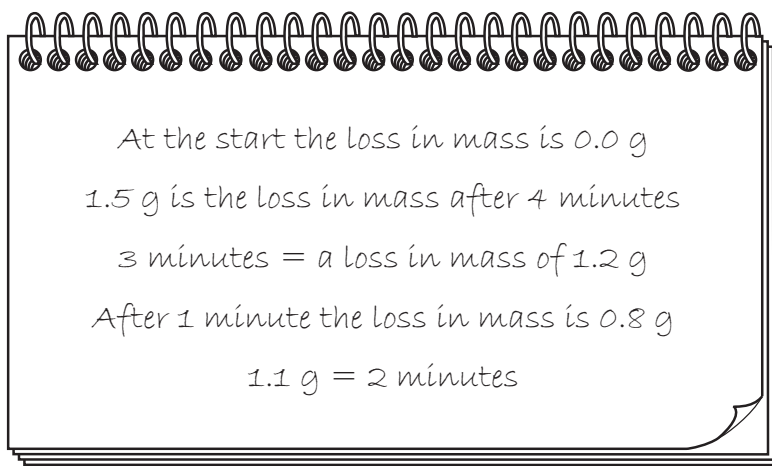


(a) Write down the name of equipment X.

..... [1]

(b) Pierre measures the loss in mass every minute for 4 minutes.

Here are his results.



Complete his results table.

.....	loss in mass in g
.....	
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

[2]