Cambridge Assessment International Education

Cambridge Lower Secondary Checkpoint

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

3738325821

SCIENCE **0893/02**

Paper 2 **April 2024**

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.

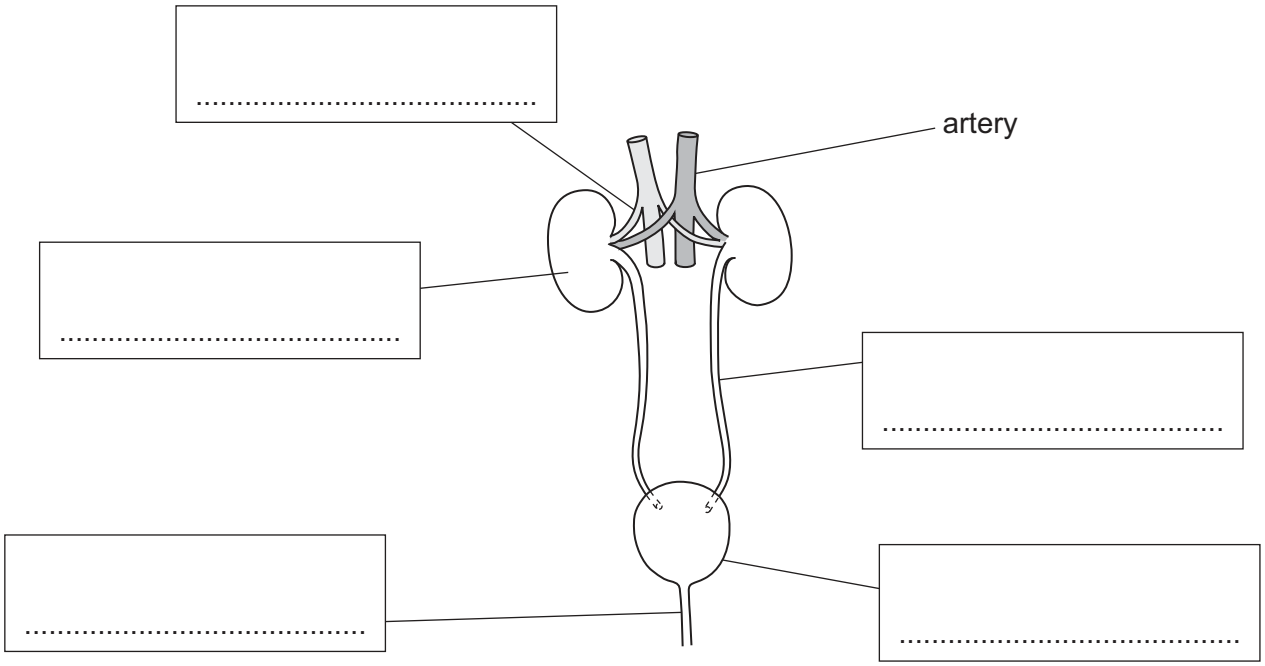
INFORMATION

- 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.

1 This question is about excretion.

Look at the model of the human excretory system.



(a) Complete the labels on the model.

Choose words from the list.

bladder

kidney

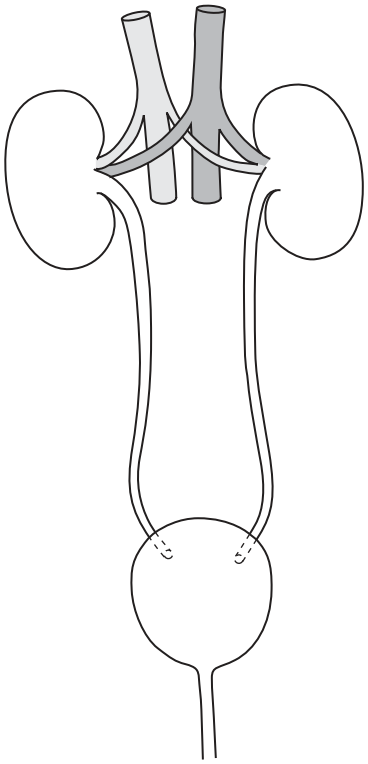
renal vein

ureter

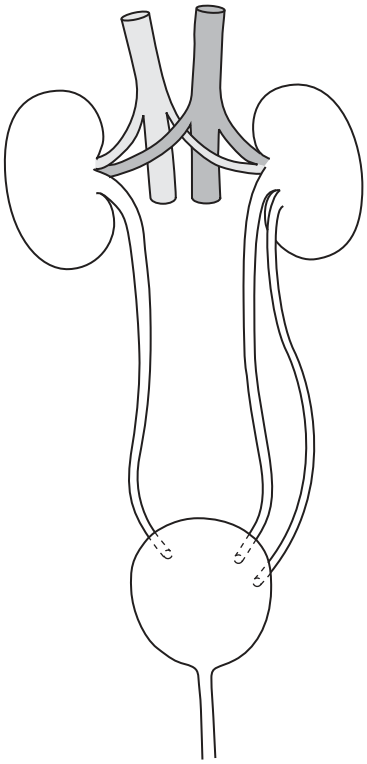
urethra

[3]

(b) The diagrams show the excretory systems of two healthy children.



child **A**



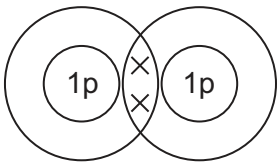
child **B**

Describe **one** difference between the excretory systems of child **A** and child **B**.

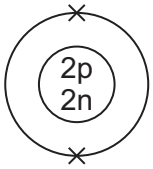
.....

..... [1]

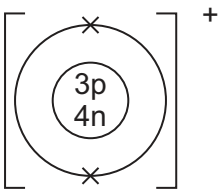
2 Look at the diagrams of models of atoms and ions.



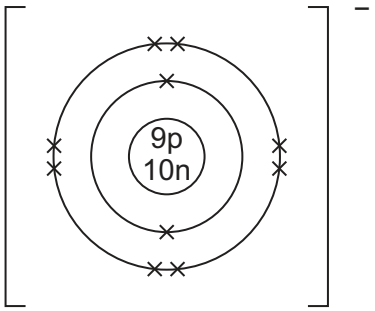
A



B



C



D

Key

× = electron

p = proton

n = neutron

(a) Which diagram is a model of a **molecule**?

.....

[1]

(b) Explain why diagram **C** is a model of a **positive ion**.

Use ideas about the particles in the ion.

.....

.....

..... [2]

(c) Which diagram shows a **covalent** bond?

.....

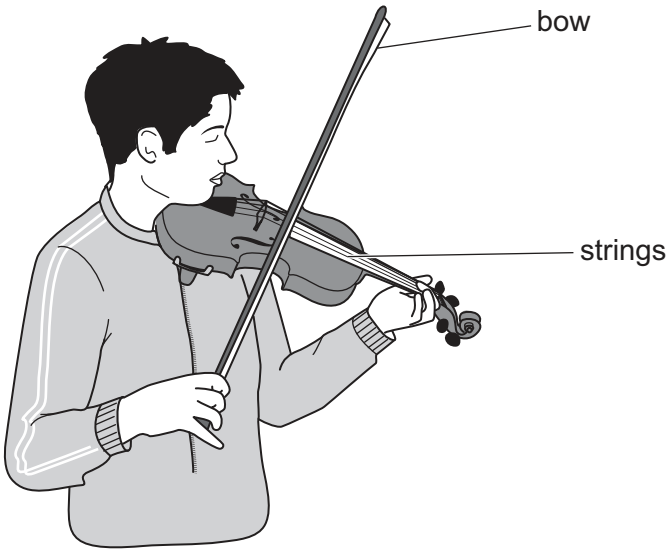
[1]

(d) Describe what is meant by an **ionic bond**.

.....

..... [1]

3 Pierre plays the violin.



Pierre moves the bow over the strings on the violin.

The strings vibrate and produce a sound.

(a) Describe what happens to the **amplitude** when the vibrations are larger.

.....

[1]

(b) The pitch of the sound changes when the strings vibrate more often.

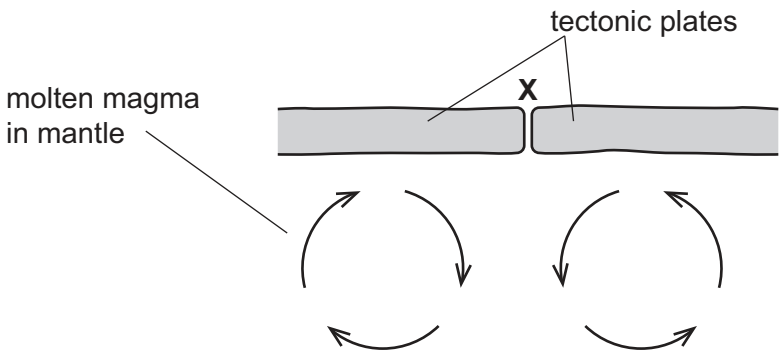
Which word describes the pitch of a sound?

.....

[1]

4 This question is about tectonic plates.

The diagram shows the process that causes tectonic plates to move.



(a) Name the process that causes tectonic plates to move.

.....

[1]

(b) Describe what happens to the two tectonic plates at position **X**.

.....

.....

[1]

5 This question is about density.

The mass of a block of silver is 840 g.

The volume of the block of silver is 80 cm^3.

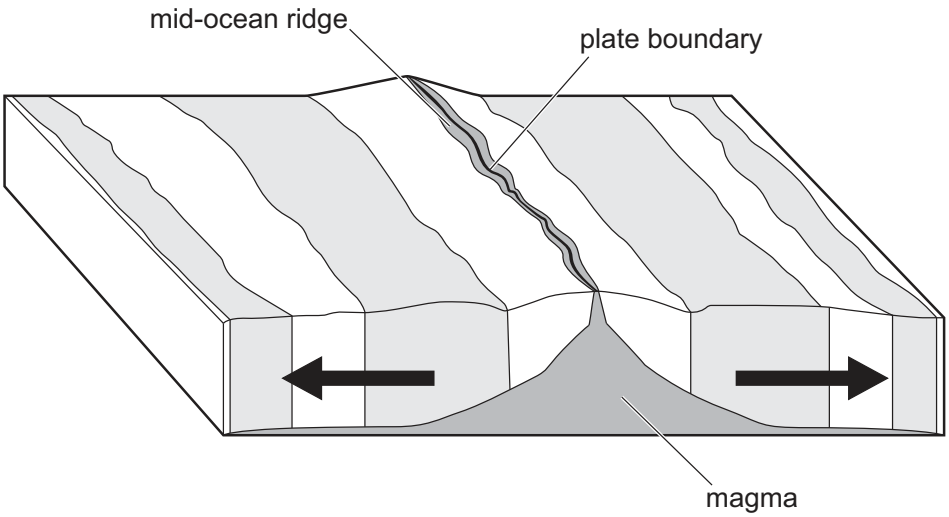
Calculate the density of the block of silver.

Include the unit of density in your answer.

density of block of silver = ... unit ..... [3]

6 This question is about the evidence for tectonic plate movement.

(a) Look at the diagram of a mid-ocean ridge in the sea floor.



Key

☐ reversed magnetic alignment

☐ normal magnetic alignment

Explain how the diagram shows evidence for tectonic plate movement.

.....

.....

.....

..... [1]

(b) Describe how the fossil record is evidence for tectonic plate movement.

.....

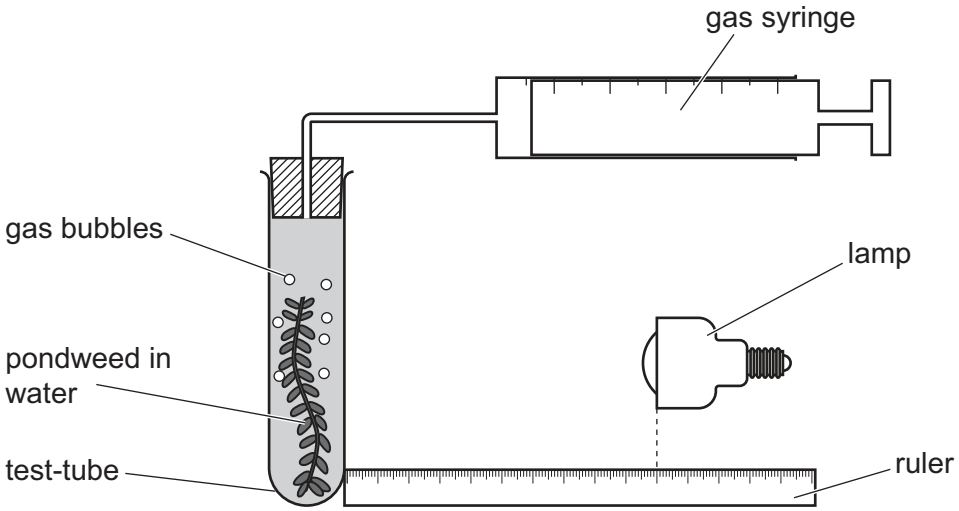
.....

.....

..... [1]

7 Priya investigates photosynthesis in pondweed.

Look at the diagram of the assembled equipment.



In her first experiment Priya:

- places the lamp 5 cm away from the test-tube
- measures the volume of gas in the gas syringe after 10 minutes.

Priya repeats the experiment several times.

Each time she increases the distance of the lamp from the test-tube.

Look at her table of results.

distance from the lamp in cm	**volume of gas in gas syringe in cm^3**
5	4.0
10	2.0
15	1.0
20	0.5
25	0.2

(a) The gas collected in the gas syringe comes from the pondweed.

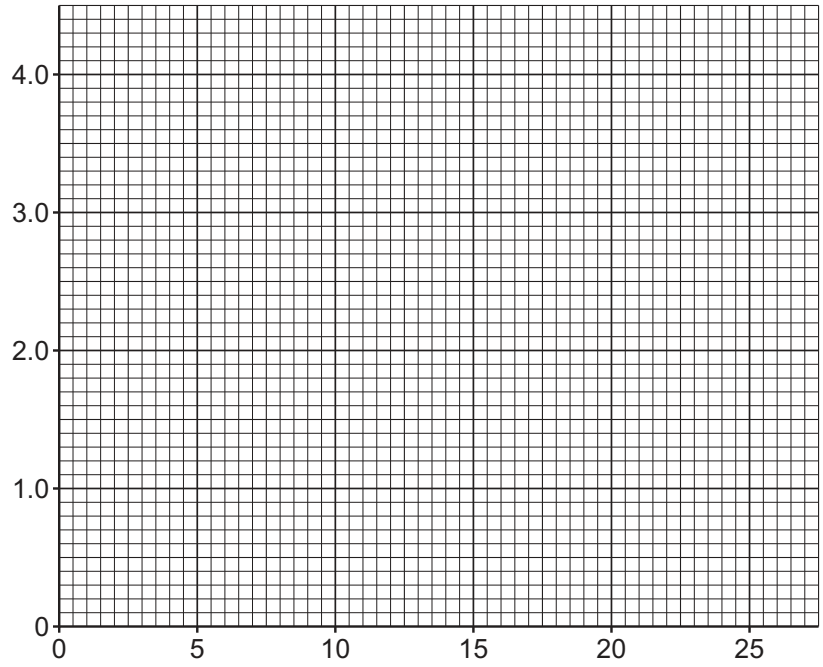
What is the name of this gas?

.....

[1]

(b) Plot the results on the grid:

- label the *x*-axis and *y*-axis
- plot the results
- draw a curve of best fit.



.....

.....

.....

.....

.....

.....

[3]

(c) Describe the relationship between distance from the lamp and volume of gas in the syringe.

.....

..... [1]

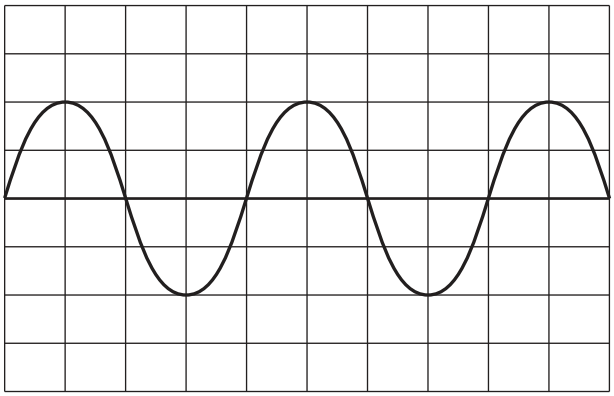
(d) Why do plants need magnesium for photosynthesis?

..... [1]

8 This question is about the interaction of sound waveforms.

(a) Look at the diagram of waveform **A**.

waveform **A**

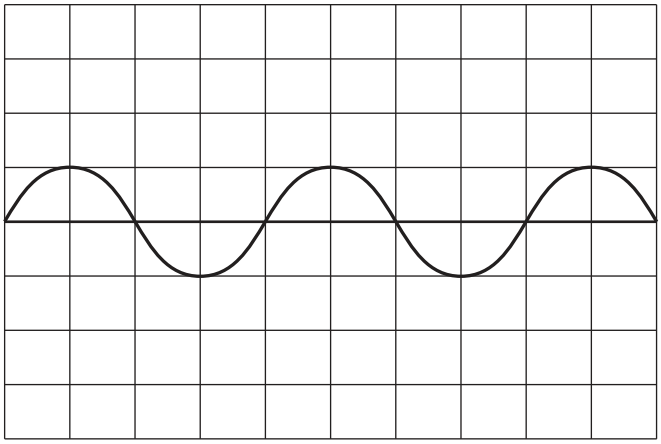


Waveform **B** and waveform **C** interact to make waveform **A**.

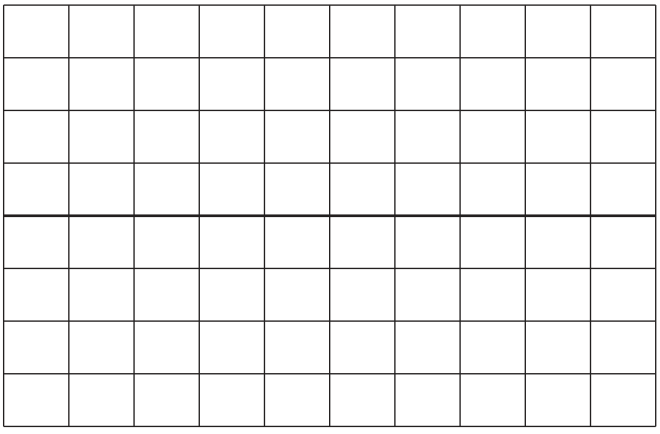
Look at the diagram of waveform **B**.

Draw waveform **C** that interacts with waveform **B** to make waveform **A**.

waveform **B**



waveform **C**



[1]

(b) Waveform **D** and waveform **E** interact and produce waveform **F**.

waveform **D**

waveform **E**

(i) Draw waveform **F** produced when waveform **D** and waveform **E** interact.

waveform **F**

[1]

(ii) Describe how the loudness of sound waveform **F** is different from the loudness of sound waveform **D**.

.....

[1]

9 This question is about extinction and conservation.

(a) The last West African black rhinoceros died in 2011.

Hunting and habitat loss were blamed for the disappearance of this rhinoceros.

Tick (✓) the box that best describes the effect of **both** hunting **and** habitat loss on this rhinoceros.

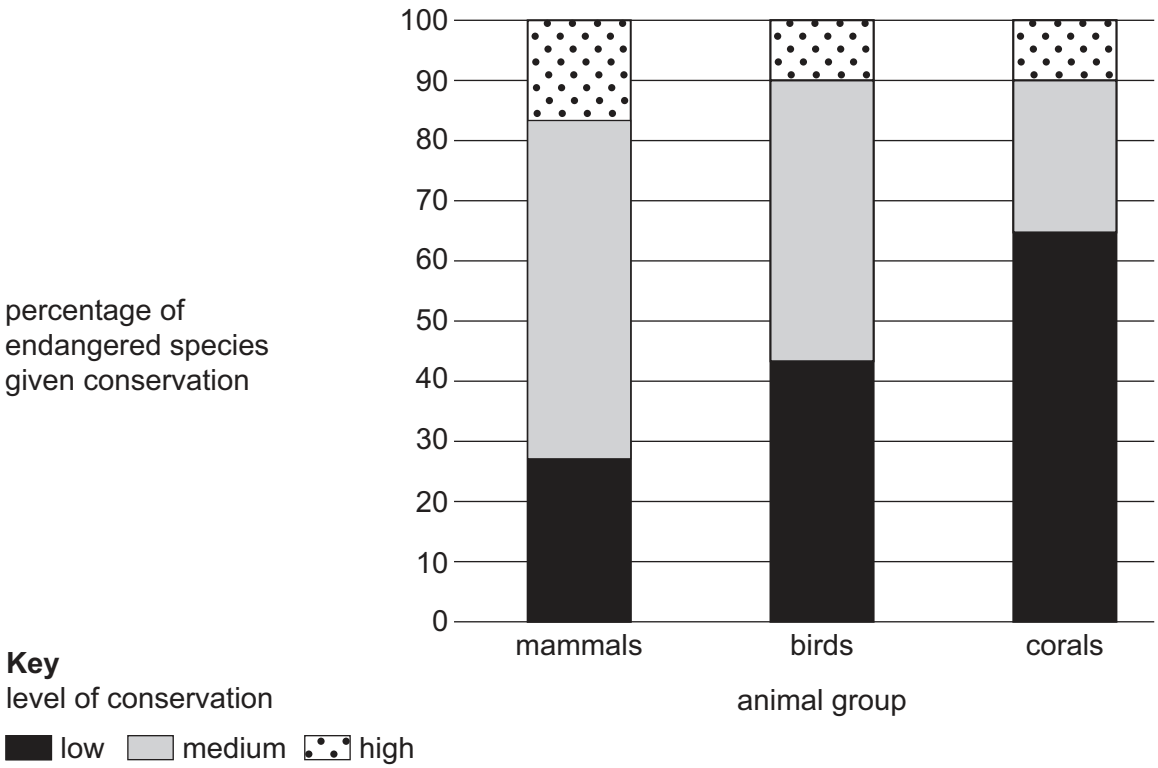
deforestation	☐
environmental change	☐
inheritance	☐
natural selection	☐
variation	☐

[1]

(b) Scientists try to prevent extinction of species by using conservation.

The chart shows the percentage of endangered species given conservation in three animal groups.

The level of conservation is described as low, medium or high.



(i) Which animal group has the greatest level of **medium** conservation?

..... [1]

(ii) Endangered species of corals and birds both get the same level of **high** conservation.

Suggest why endangered species of corals are more likely to become extinct than endangered species of birds.

Use information from the chart.

.....

..... [1]

10 This question is about the resistance of a lamp.

The current through the lamp is 5.0 A.

The voltage across the lamp is 2.7 V.

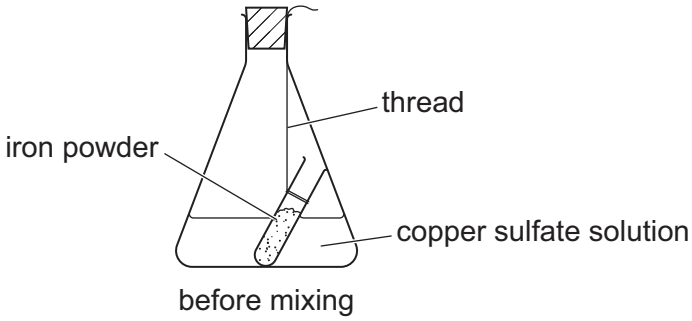
Calculate the resistance of the lamp.

resistance = ... Ω [2]

11 Chen investigates a displacement reaction.

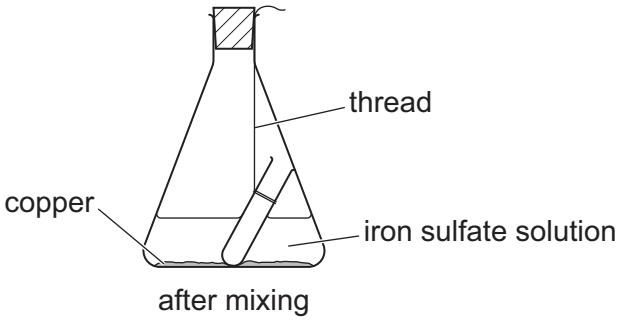
Chen:

- assembles the equipment shown in the diagram



before mixing

- measures the mass of the equipment
- tips the equipment so that the iron powder mixes and reacts with the copper sulfate solution
- measures the mass of the equipment after the reaction has finished.



after mixing

(a) Describe how the total mass before mixing compares with the total mass after mixing.

.....

Explain your answer.

.....

.....

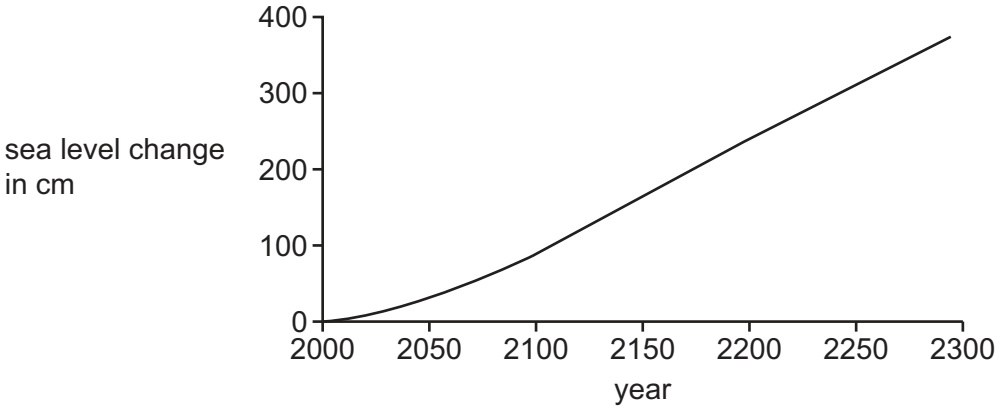
[2]

(b) Write the word equation for the reaction.

..... [1]

12 Look at the graph.

The graph shows a prediction about how the sea level will change from its value in the year 2000.



(a) Suggest **one** reason for the trend in sea level change shown in the graph.

.....

[1]

(b) Suggest **one** impact of the trend in sea level change shown in the graph.

.....

[1]

13 You will need to use the Periodic Table of the Elements on page 20 to answer this question.

Look at the table about some Group 1 elements.

element	boiling point in °C
lithium	
sodium	883
potassium	760
rubidium	686

(a) Write down the name of **one other** Group 1 element.

.....

[1]

(b) Predict the boiling point of lithium.

boiling point of lithium = ... °C [1]

(c) Oxygen is an element in Group 6.

Oxygen has a melting point of –218 °C and a boiling point of –183 °C.

What **type of structure** does oxygen have?

..... [1]

14 Anastasia describes an electrical circuit she makes.

Her circuit contains a battery, a switch, one lamp, a fixed resistor and some wires.

(a) Anastasia says,

'When I add another lamp to my circuit the brightness of the first lamp decreases.'

Explain this observation.

Use ideas about:

- the **type** of circuit
- the current in the circuit.

.....

.....

.....

..... [2]

(b) Draw the standard electrical symbol for a fixed resistor.

..... [1]

15 This question is about nebulae.

(a) Lily writes statements about how stars are formed from nebulae.

A large clouds of dust and gases collapse

B the core of a star is formed

C gravity brings clouds of dust and gases together

D collapsed material at the centre of the clouds of dust and gases heats up

E the clouds of dust and gases increase in size because of gravity

Put the statements in the correct order.

One has been done for you.

.....	.....	**A**	.....	.....

[2]

(b) Circle the word used to describe nebulae that form stars.

galaxies **nurseries** **planets** **systems** [1]

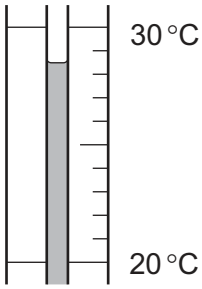
16 Ahmed investigates the cooling of water.

In his first experiment he:

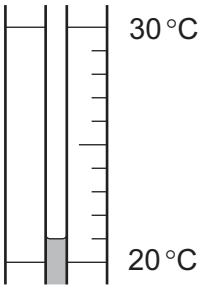
- pours some water into a beaker
- measures the initial temperature of the water
- measures the temperature of the water after five minutes.

Ahmed repeats the experiment using a different beaker.

The thermometer diagrams show the final temperatures of the water.



beaker **1**



beaker **2**

(a) Write the final temperatures to the nearest 0.5 °C in the table of results.

	starting temperature in °C	**final temperature in °C**	**temperature change in °C**
beaker **1**	36.0	.....	.....
beaker **2**	22.5	.....	.....

[2]

(b) Calculate the temperature change in both beakers.

Write your answers in the table of results. [1]

(c) Darker-coloured objects radiate thermal energy more efficiently than lighter-coloured objects.

Ahmed writes a hypothesis using this information.

Complete his hypothesis.

Painting the outside of a beaker of water in a ..... colour will

..... the heat loss from the water.

[1]

