Cambridge Assessment International Education

Science

Stage 6

Paper 2

35 minutes

No additional materials are needed.

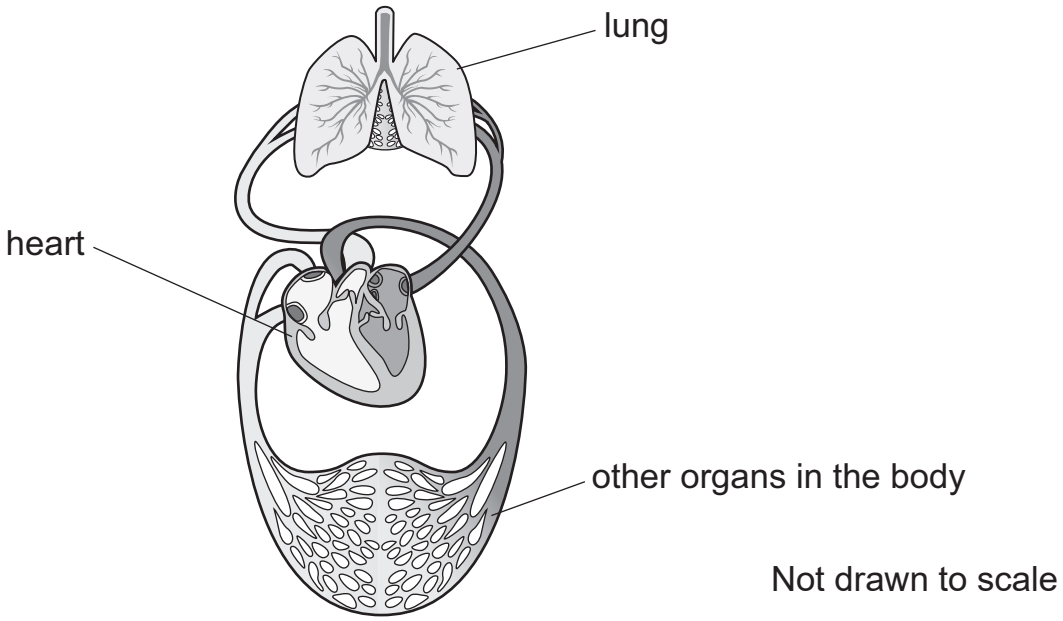
INSTRUCTIONS

- Answer **all** questions.
- Write your answer to each question in the space provided.
- You should show all your working on the question paper.

INFORMATION

- The total mark for this paper is 40.
- The number of marks for each question or part question is shown in brackets [ ].

1 The diagram shows part of the human circulatory system.



(a) The heart pumps blood through **three** different types of blood vessels.

Write down the names of the **three** different types of blood vessels.

1 .....

2 .....

3 .....

[2]

(b) The blood carries important substances.

Complete the sentences.

Choose the best words from the list.

acid **air** **mucus**

nutrients **oxygen** **waste**

The blood collects ..... at the lungs.

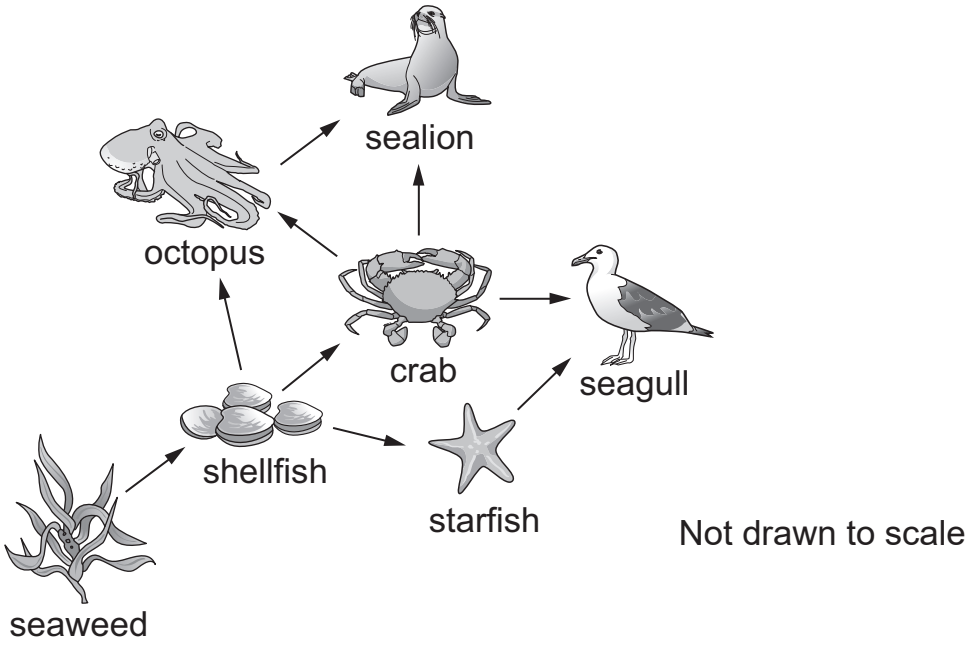
The blood takes this substance to the other organs in the body.

The blood also takes ..... to the other organs in the body.

Blood removes ..... from the other organs in the body.

[2]

2 The diagram shows a food web.



(a) Write down the energy source for this food web.

.....

[1]

(b) Complete these **two** food chains from the food web.

seaweed → shellfish → ..... → seagull

seaweed → shellfish → ..... → .....

↓

sealion

[2]

(c) The shellfish absorb a toxic substance.

The crab eats the shellfish and then has the toxic substance inside its body.

The sealion does **not** eat the shellfish.

The sealion has **more** of the toxic substance inside its body than the crab.

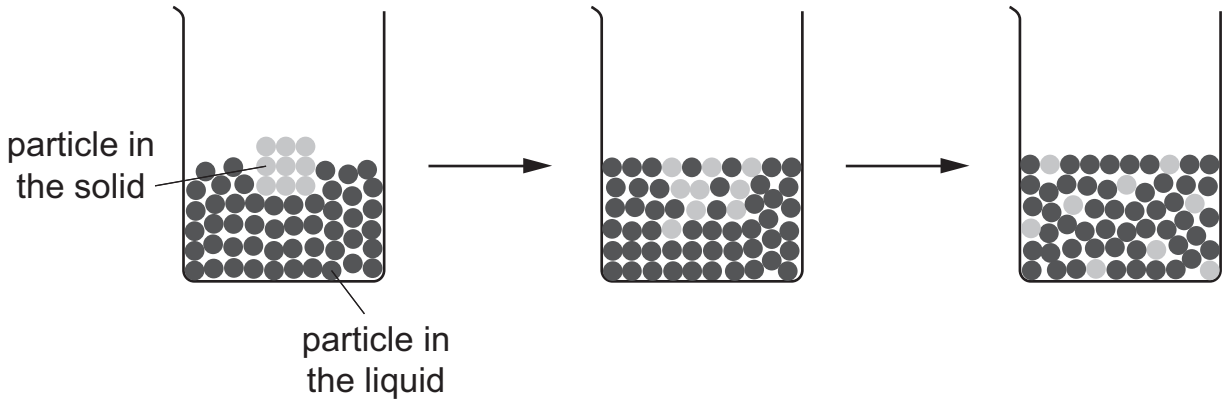
Explain why.

.....

.....

[1]

3 Lily draws a model to help describe how a solid dissolves in a liquid.



(a) The solid dissolves in the liquid.

Use the model to describe what happens when the solid dissolves.

.....

.....

..... [2]

(b) The temperature of the liquid increases.

The liquid does **not** change into a gas.

Write down **two** things that happen to the particles when the temperature of the liquid increases.

1 .....

2 .....

[2]

4 Blessy is a scientist.

She investigates how bacteria grow in different solutions.

Blessy puts:

- the same amount of bacteria in each dish
- the same amount of nutrients in each dish
- water in only one dish
- different strengths of acid in the other dishes
- the dishes in a warm place for five days.

(a) Write down **two** variables Blessy **controls** in her investigation.

1 .....

2 .....

[2]

(b) There are risks with this investigation.

Write down **one** risk and **one** way to reduce this risk.

risk .....

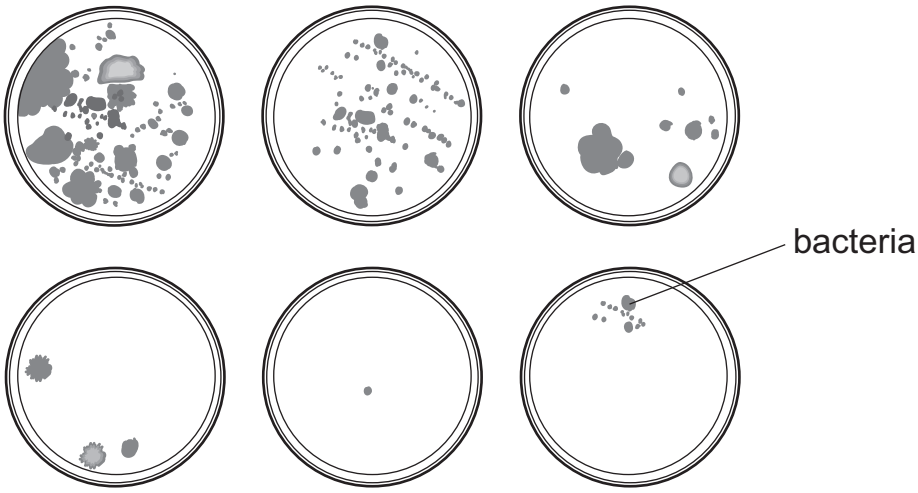
.....

way to reduce this risk .....

.....

[2]

(c) Here are the dishes after five days.



Show which dish contains water and which dish contains the highest strength of acid by:

- writing the letter **W** on the dish that contains water
- writing the letter **A** on the dish with the highest strength of acid.

[1]

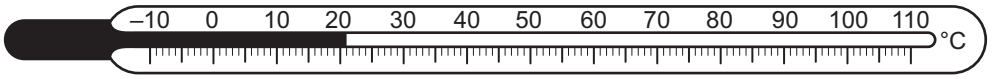
(d) Humans use acid as a defence against bacteria.

Write down the name of the organ in the human body that uses acid.

..... [1]

5 Thermometers are used to measure temperature.

(a) Look at the thermometer.



Write down the temperature the thermometer is measuring.

..... °C [1]

(b) Thermometers measure the boiling point of a substance.

What is the meaning of **boiling point**?

.....

..... [2]

(c) The table shows the melting point and boiling point of five substances used in thermometers.

substance	melting point in °C	boiling point in °C
ethanol	–114	78
gallium	30	2403
glycol	–12	198
mercury	–39	357
water	0	100

Complete the sentences.

Choose words from:

ethanol **gallium** **glycol** **mercury** **water**

The substance with the **highest** boiling point is .....

The substance with the **least** difference between its melting point and boiling point is .....

The substance in a thermometer must be a **liquid** to measure temperature.

The substance used to measure a temperature of –50 °C is .....

[2]

6 Mia investigates floating and sinking.

She uses six balls and a beaker of water.

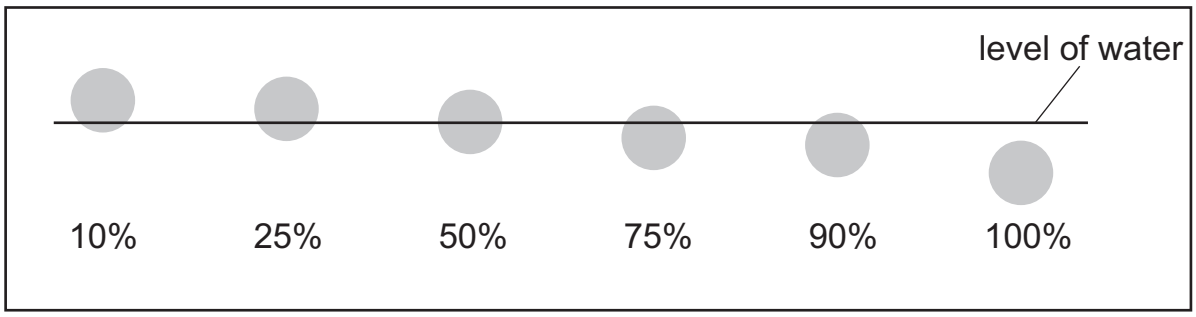
All the balls are the same size but are made from different materials.

Mia:

- puts each ball in the beaker of water
- waits 2 minutes
- looks at where each ball is floating.

Mia compares her observations to a chart she finds in a book.

Look at the chart.



(a) Complete the sentences to explain how the chart works.

The chart starts at 10% and ends at 100%.

At 10% the ball is .....

At 50% the ball is .....

At 100% the ball is .....

[2]

(b) Look at the results.

ball	percentage %
A	33
B	10
C	50
D	40
E	12
F	90

Put each ball into the correct group.

percentage 0% to 32%	percentage 33% to 66%	percentage 67% to 100%

[2]

(c) Look at the results for ball **B** and ball **F**.

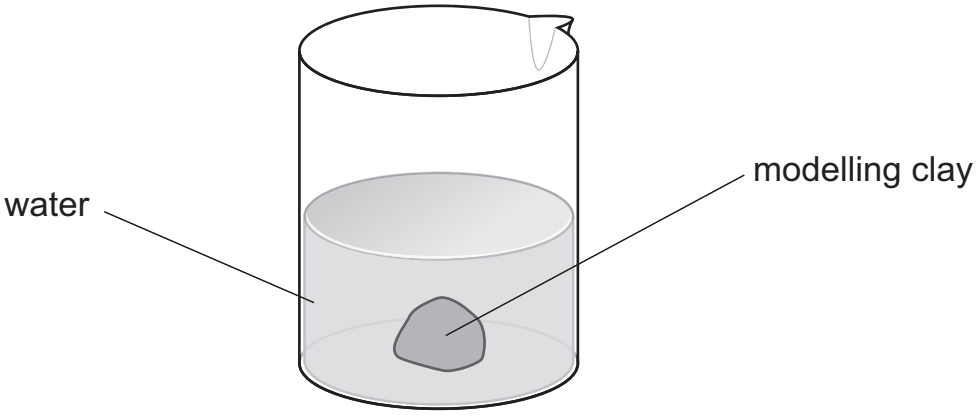
Complete the conclusion for this investigation.

Ball **F** ..... **more** than ball **B**.

This is because ball **F** is ..... than ball **B**.

[2]

(d) Mia now puts modelling clay into a beaker of water.



Mia wants the modelling clay to float.

Mia does not change the mass of the modelling clay.

Suggest what Mia does to the modelling clay to make it float.

.....

.....

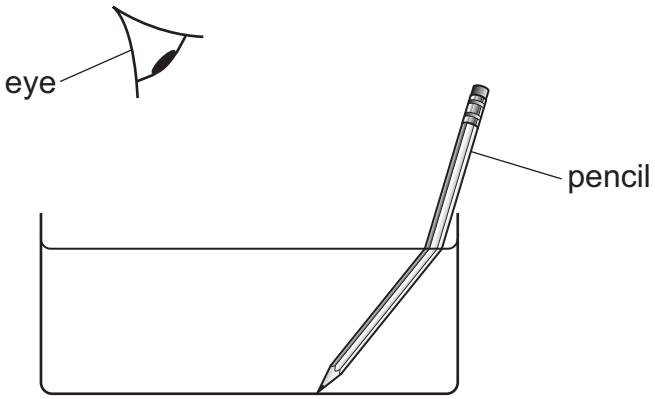
[1]

7 Mike puts a pencil into water.

He says:

'The pencil looks bent where it goes into the water.'

Mike draws a diagram to show what he sees.



(a) Explain why the pencil looks bent.

Use ideas about a ray of light in your answer.

.....

.....

..... [2]

(b) A ray of light is reflected from a plane mirror.

Draw a diagram to show this.

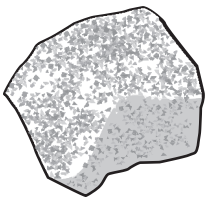
The plane mirror has been drawn for you.

plane mirror

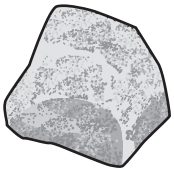
[1]

8 Look at the information about **six** different rocks.

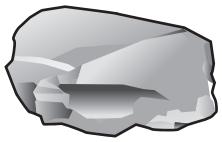
A
black rock formed by high pressure



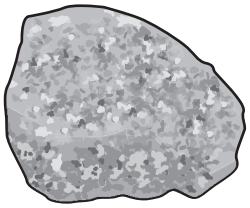
B
white hard rock formed by high heat and high pressure



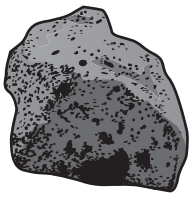
C
yellow rock made from layers of sand



D
grey and white hard rock formed when chalk is heated



E
rock with large crystals formed when magma cools slowly



F
black rock with small crystals formed when lava cools quickly

(a) Which rock is a **sedimentary** rock?

Circle the correct answer.

A **B** **C** **D**

[1]

(b) What type of rock are **E** and **F**?

..... [1]

(c) Rocks **E** and **F** have different size crystals.

Suggest and explain why the crystals are **larger** in rock **E** than rock **F**.

suggestion .....

.....

explanation .....

..... [2]

(d) Which are the **best** words to describe some of the processes in the rock cycle?

Circle the correct answer.

burial and burning

erosion and evaporating

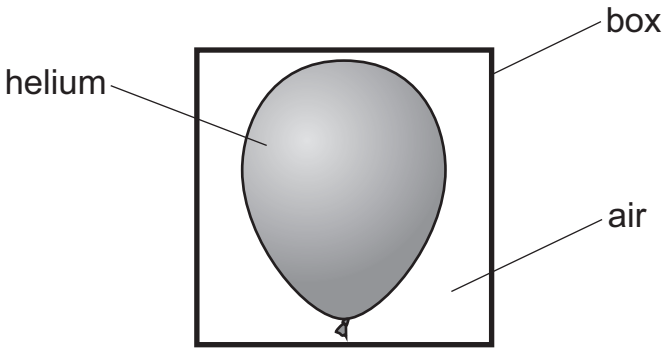
metamorphism and melting

solidification and sorting

[1]

9 Rajiv fills a balloon with helium gas.

He puts the balloon inside a tightly sealed box containing air.



Complete the sentences.

Choose words from:

air **balloon** **box** **decreases**

helium **increases** **stays the same** **water**

The balloon is popped.

The helium gas mixes with the .....

The helium gas spreads out to fill the .....

The mass of helium .....

[2]