Cambridge Assessment International Education

Science

Stage 8

Paper 2

2024

Cambridge Lower Secondary Progression Test

Name

Class

Date

45 minutes

No additional materials are needed.

INSTRUCTIONS

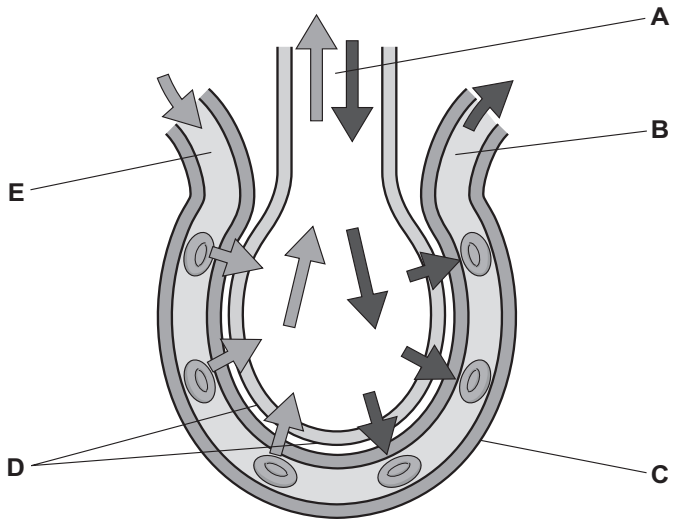
- Answer **all** questions.
- Write your answer to each question in the space provided.
- You should show all your working on the question paper.

INFORMATION

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

1 Alveoli are air sacs found at the end of the bronchioles in the lungs.

(a) The diagram shows how gas is exchanged in alveoli.



Match the **description** to the correct **letter** shown in the diagram.

Write your answers in the table.

description	letter
place where the blood has the highest oxygen concentration	
blood capillary wall	
a surface where gas exchange happens	

[3]

(b) Alveoli are adapted to maximise gas exchange.

Describe **one adaptation** of the alveoli and explain how this helps to maximise gas exchange.

adaptation .....

.....

explanation .....

.....

[2]

(c) Red blood cells transport oxygen around the body.

Which mineral in the diet is needed to make red blood cells?

..... [1]

2 This question is about reactions of magnesium.

(a) Mia heats a piece of magnesium over a blue Bunsen flame.

(i) The magnesium reacts with a gas in the air.

Write down the name of this gas.

..... [1]

(ii) Describe one **safety risk** in this investigation and how to control the risk.

safety risk .....

how to control risk .....

.....

[2]

(b) Magnesium reacts with dilute hydrochloric acid.

Circle **all** the products of this reaction.

carbon dioxide	**chlorine**	**hydrogen**
magnesium chloride	**magnesium hydroxide**	**water**

[2]

3 Safia uses an electromagnet to pick up steel pins.

She changes the current in the wire and records her results in the table.

current in A	number of pins
0.25	1
0.50	2
0.75	3
1.00	1
1.25	5

(a) Circle the anomalous result in the table. [1]

(b) The current in the wire changes the strength of the electromagnet.

Suggest **one other** factor that changes the strength of the electromagnet.

..... [1]

4 Space has many parts.

Draw a straight line from each **part** to its correct **description**.

part	description
galaxy	clouds of particles in space
solar system	object orbiting a planet
stellar dust	large group of stars
	small planets
	planets orbiting around a star

[3]

5 Some industries produce toxic substances.

These toxic substances sometimes enter food chains.

Look at the food chain.

algae → mayfly → small fish → big fish → otter

(a) Suggest a habitat where this food chain is found.

..... [1]

(b) The table shows how the amount of toxic substance increases along the food chain.

organism	relative concentration of toxic substance
algae	1
mayfly	12
small fish	50
big fish	320
otter	5000

(i) Explain why the relative concentration of toxic substance is **much higher** in an otter than a big fish.

.....

..... [1]

(ii) The amount of toxic substance increases along the food chain.

What is this process called?

..... [1]

(c) Write down **one impact** of increasing the concentration of toxic substances on an ecosystem.

.....

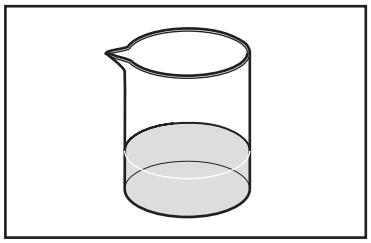
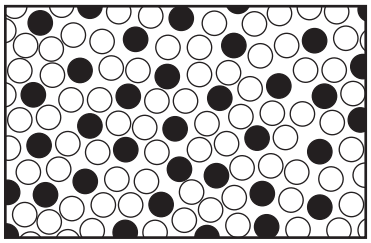
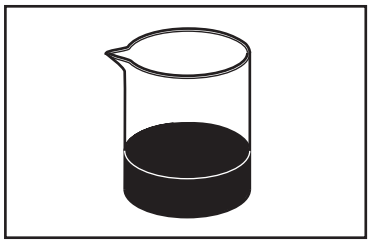
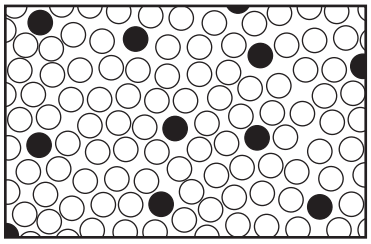
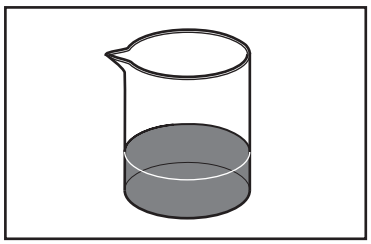
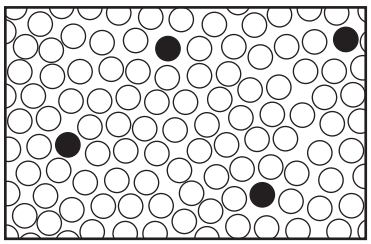
..... [1]

6 This question is about dissolving.

(a) When a blue food colour dissolves in water the solution turns blue.

As the concentration of the blue food colour increases the solution becomes darker.

Draw a straight line from each **solution** to the correct **particle diagram** representing the solution.

solution	particle diagram
	
	
	

● = particle of blue food colour
○ = particle of water

[1]

(b) Circle the word in **bold** that makes each sentence correct.

Blue food colour dissolves in water.

The blue food colour is the **solute / solvent / soluble**.

Water is the **solute / solvent / soluble**.

[1]

7 Ahmed investigates primary and secondary colours.

(a) Which colour of light is produced when red light and green light are mixed?

Circle the correct answer.

yellow **blue** **cyan** **magenta** **white**

[1]

(b) Ahmed wears a magenta and green striped shirt.

Complete the sentences to explain how Ahmed's shirt looks in **blue light**.

In blue light, the magenta stripes look the colour ..... .

This is because magenta .....

..... .

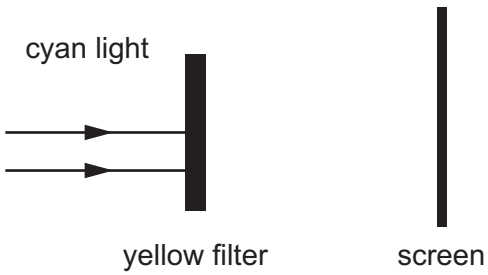
In blue light, the green stripes look the colour ..... .

This is because green .....

..... .

[2]

(c) Ahmed passes cyan light through a yellow filter.



Explain which colour light is seen on the screen.

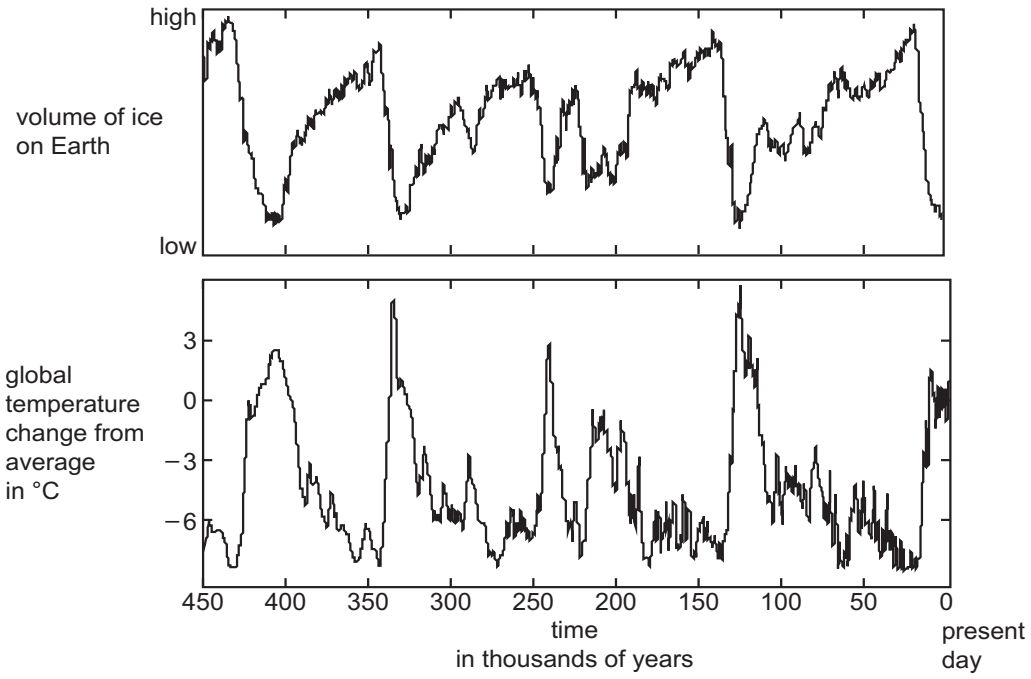
colour light .....

reason .....

.....

[1]

8 Look at the graphs about the volume of ice on Earth and global temperature change.



(a) Use information from the graphs to answer these questions.

(i) When was the **highest** global temperature?

..... thousand years ago [1]

(ii) Describe the relationship between the global temperature and the volume of ice on Earth.

.....

..... [1]

(b) Climate and weather are two different things.

Which statements are about **climate**?

Tick (✓) **all** the correct boxes.

average rainfall for a particular region	
changes in the atmosphere during a 24-hour period	
highest temperature recorded in a week	
long-term temperature pattern in a given area	
predicting when the next thunderstorm will happen	

[2]

9 Gold metal is used to make jewellery.

The purity of gold mixed with other metals is measured using a system called the carat rating.

The table shows the percentage of gold and the percentage of other metals in different carat ratings.

carat rating	minimum percentage of gold in the metal	maximum percentage of other metals mixed with the gold
24	100.0	0.0
22	91.6	8.4
18	75.0	25.0
14	58.5	41.5
10	41.7	58.3

A piece of gold mixed with other metals has a mass of 200 g.

The mass of gold in this mixture is 86.5 g.

(a) Calculate the percentage of gold in the mixture.

percentage of gold ..... % [1]

(b) What is the carat rating for this mixture of gold and other metals?

carat rating ..... [1]

10 Complete the sentences about diffusion.

Diffusion occurs in gases and ..... .

When perfume is sprayed in a room, the perfume particles and air particles move and

..... .

Diffusion occurs more quickly if a gas is hotter because the gas particles move

..... .

[2]

11 Yuri investigates the water content of potatoes.

Yuri:

step **1** - cuts a piece of potato with a sharp knife into a cube of mass 10.0 g

step **2** - heats the cube of potato in a microwave for 1 minute

step **3** - uses a balance to find the mass of the cube of potato

step **4** - repeats steps **2** and **3** until the cube of potato has been heated for a total of 10 minutes.

(a) Here are his results.

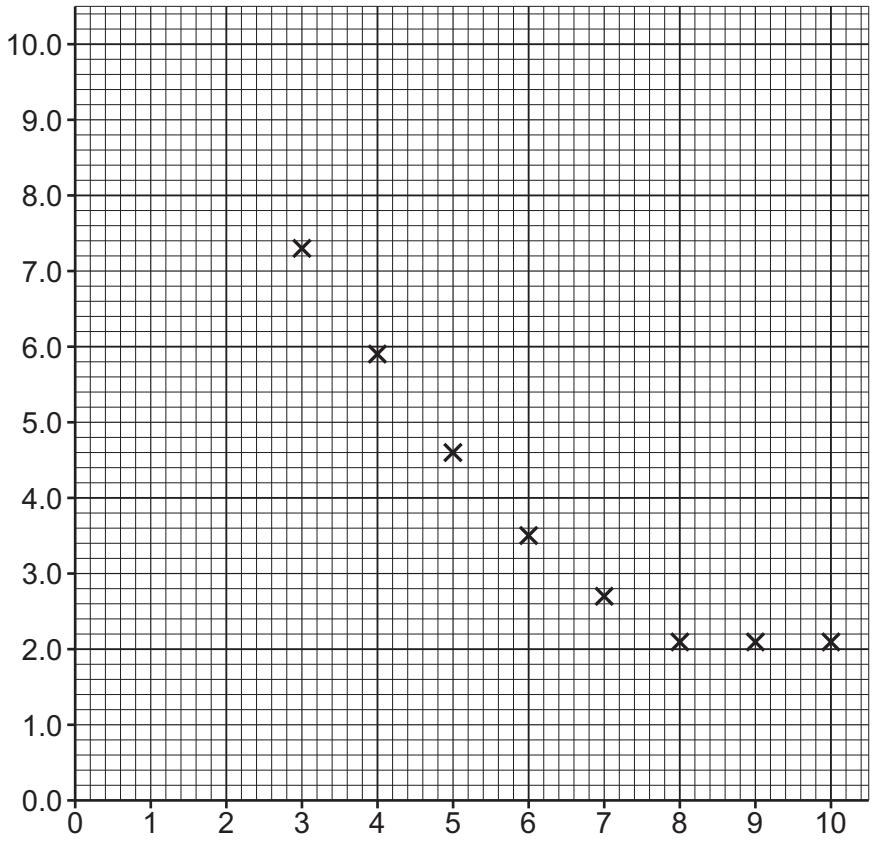
time in minutes	**mass of cube of potato in g**
0	10.0
1	9.4
2	8.5
3	7.3
4	5.9
5	4.6
6	3.5
7	2.7
8	2.1
9	2.1
10	2.1

Look at the graph of his results.

The last eight masses from the table have been plotted on the graph.

Complete the graph by:

- labelling the axes
- plotting the first three masses from the table on the graph
- drawing a curve of best fit.



.....

.....

.....

.....

[4]

(b) Yuri says,

'I have read that vegetables are 90% water.
I predict 90% of this potato will be water.'

Tick (✓) to show if the results support Yuri's prediction.

yes ☐ no ☐

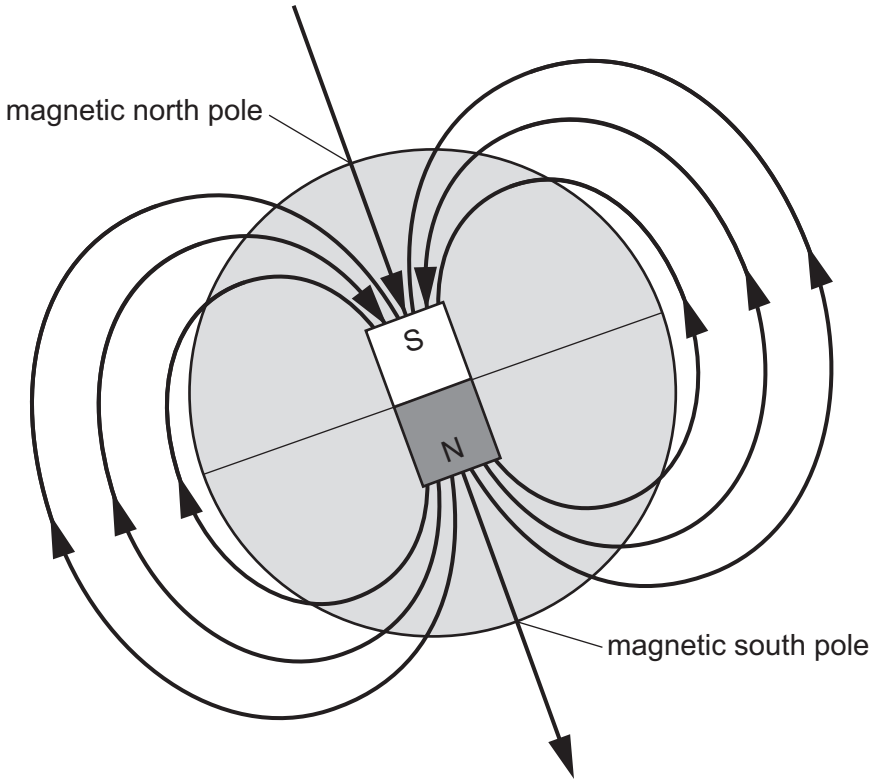
Explain your answer.

.....

.....

[1]

12 The diagram shows an analogy to describe the Earth's magnetism.



(a) Which part of the Earth's structure is represented by the bar magnet?

..... [1]

(b) What do the arrows represent?

..... [1]

13 Mike investigates reactions.

In his first experiment Mike:

- pours some water into a beaker
- measures the temperature of the water
- adds 1g of a solid to the water
- stirs the mixture until the temperature stops changing.

Mike repeats the experiment with four other solids.

Look at his results.

solid	temperature at the start in °C	temperature at the end in °C
A	20	20
B	21	28
C	19	15
D	18	19
E	21	27

(a) (i) How many solids have an endothermic reaction with water?

.....

[1]

(ii) Mike has **not** done a fair test.

Suggest **one** way Mike could improve his investigation to make it a fair test.

.....

.....

[1]

(iii) Mike describes solid **A** as being inert.

What is meant by the term inert?

.....

[1]

(b) One example of an exothermic reaction is adding calcium oxide to water.

The product is calcium hydroxide.

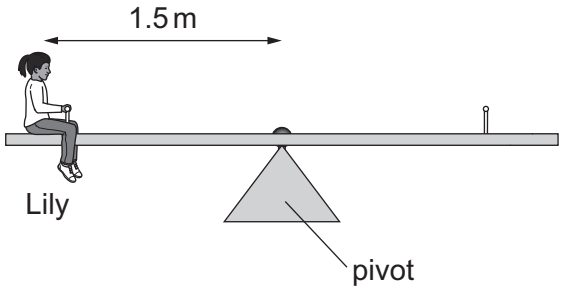
Write the word equation for this reaction.

.....

[1]

14 Lily and Blessy play on a seesaw.

(a) Lily sits at a distance of 1.5 m from the pivot.



Lily weighs 500 N.

Calculate the moment of Lily's weight about the pivot.

Include the unit in your answer.

moment of Lily's weight = ... unit ..... [3]

(b) Blessy sits on the seesaw with Lily.

Blessy weighs 600 N.

The seesaw is balanced.

Calculate the distance Blessy sits from the pivot.

Use ideas about the principle of moments.

distance from pivot ..... m [2]