Cambridge Assessment International Education

Science

Stage 7

Paper 1

2022

Cambridge Lower Secondary Progression Test

Name

Class

Date

45 minutes

No additional materials are needed.

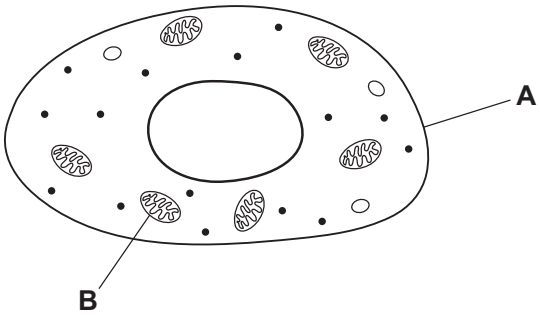
INSTRUCTIONS

- 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 Look at the diagram of an animal cell.



(a) Write down the name of structure **A**.

.....[1]

(b) Write down the function of structure **A**.

.....[1]

(c) Write down the name of structure **B**.

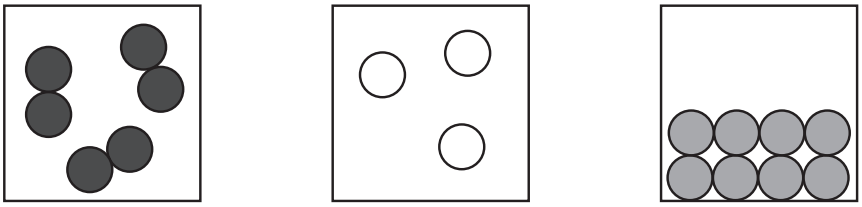
.....[1]

(d) Write down the function of structure **B**.

.....[1]

2 Look at the particle models for elements **X**, **Y** and **Z**.

● = one atom of **X** ○ = one atom of **Y** ● = one atom of **Z**



X **Y** **Z**

(a) Write down **two** characteristics of an element.

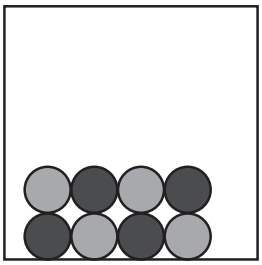
1 .....

2 .....

[2]

(b) Element **X** reacts with element **Z**.

Look at the particle model of the substance made.



Circle the type of substance made.

compound **mixture**

Explain your answer.

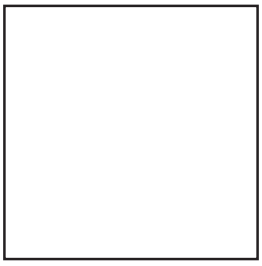
.....

.....

.....

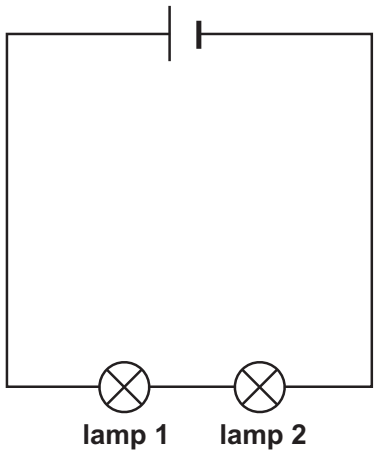
[2]

(c) Draw a particle model for a mixture of elements **X** and **Y**.



[1]

3 Mike makes an electrical circuit.



(a) Mike wants to turn the lamps on and off.

Which component does he add to his electrical circuit?

..... [1]

(b) Mike wants to add a buzzer to his electrical circuit.

Draw the electrical symbol for a buzzer.

[1]

(c) Lamp **1** and lamp **2** are in a series circuit.

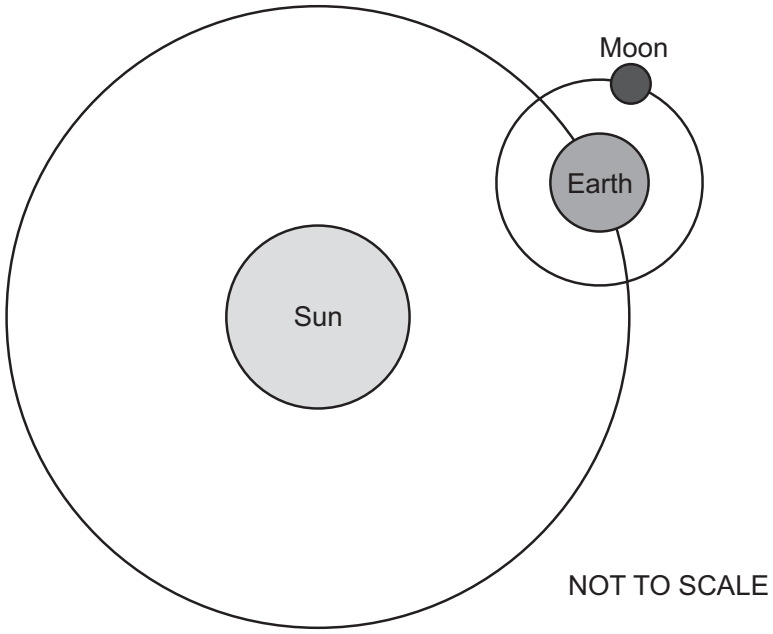
Lamp **1** stops working.

Explain why lamp **2** also stops working.

.....

..... [1]

4 Look at the diagram of the Earth, Sun and Moon.



(a) The Earth orbits the Sun.

Name the force that keeps the Earth in its orbit.

.....[1]

(b) Explain what happens during a solar eclipse.

You may use the diagram to explain your answer.

.....

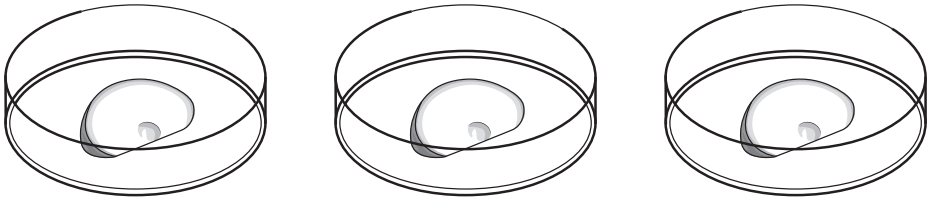
.....

.....[2]

5 Mia investigates the rate of decomposition of slices of apple.

Mia:

- puts one slice of apple into each of the three dishes
- keeps the dishes at different temperatures
- records the mass of each slice of apple every day for five days.



at 4°C at 20°C at 30°C

(a) Write down the **independent** variable in this investigation.

.....[1]

(b) Mia wants her investigation to be a fair test.

Identify **three control** variables for her investigation.

1 .....

2 .....

3 .....

[3]

(c) Mia measures the mass of each slice of apple every day for five days.

She uses this information to calculate the rate of decomposition.

(i) Which **two** pieces of equipment does Mia use to make these measurements?

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

(ii) Describe how Mia uses these measurements to calculate the rate of decomposition.

.....

.....[1]

6 Copper carbonate is a green solid.

When copper carbonate is heated a black solid called copper oxide is made.

Carbon dioxide is also made.

(a) Write down the names of the reactant and the products in this reaction.

reactant .....

products .....

[1]

(b) A chemical reaction takes place when copper carbonate is heated.

Write down **two** observations that show a chemical reaction takes place.

1 .....

2 .....

[2]

(c) Which chemical is used to test for carbon dioxide?

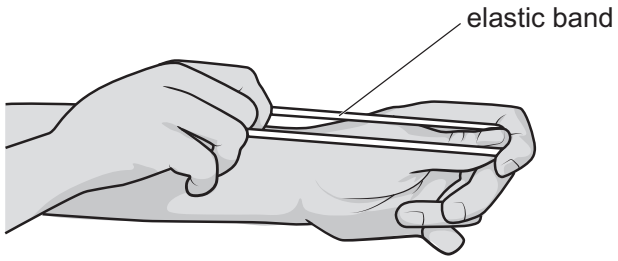
..... [1]

7 Carlos investigates the energy stored in an elastic band.

Here is his method.

Carlos:

- stretches the elastic band to a length of 10 cm
- lets go of the elastic band
- measures the distance the elastic band travels
- repeats this experiment two more times.



Carlos then measures the distances travelled when the elastic band is stretched to different lengths.

He stretches the elastic band to lengths of 12 cm, 14 cm and 16 cm.

Look at the results.

length of the stretched elastic band in cm	**distance the elastic band travels in cm**			
	1st experiment	**2nd experiment**	**3rd experiment**	**average**
10	78	46	80	.....
12	120	125	124	123
14	220	220	215	218
16	380	370	400	383

(a) Energy is stored in the stretched elastic band.

There is an energy change when Carlos lets go of the elastic band.

Complete the diagram to suggest the types of energy released.

stored energy → ..... + ...

[2]

(b) Name the equipment Carlos uses to measure the distance the elastic band travels.

.....[1]

(c) **(i)** One of the results is anomalous.

Circle the anomalous result in the table.

[1]

(ii) Look at the results when the elastic band is stretched to a length of 10 cm.

Calculate the average distance the elastic band travels.

Write your answer in the table.

[1]

(iii) Carlos thinks the result is anomalous because he pointed the elastic band upwards and not sideways.

Suggest why this will make the result anomalous.

.....[1]

8 Complete these sentences about the water cycle.

Heat from the Sun causes water in seas, rivers and lakes to ..... .

Clouds form when water vapour in the air ..... .

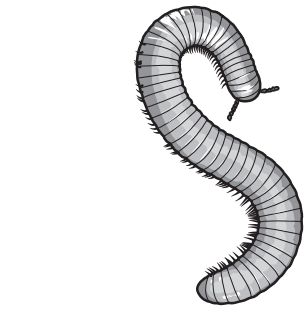
Water falling as rain is called ..... .

Some of this water filters **into** the Earth's surface.

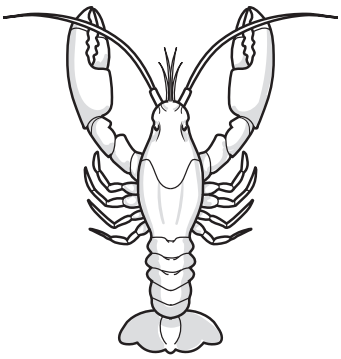
This water is called ..... .

[4]

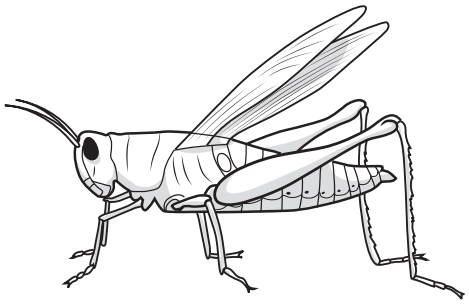
9 Look at the diagrams of the four arthropods, **A**, **B**, **C** and **D**.



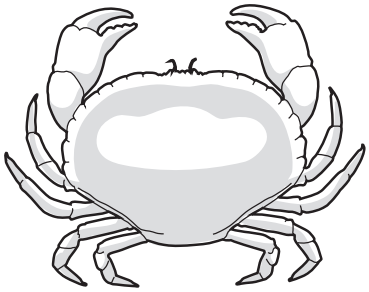
A



B



C



D

NOT TO SCALE

Use the key to identify each arthropod.

1a	has two claws	go to 2
1b	does **not** have claws	go to 3
2a	has a segmented tail	*Orconectes punctimanus*
2b	does **not** have a segmented tail	*Cancer pagurus*
3a	has wings	*Schistocerca gregaria*
3b	does **not** have wings	*Enantiulus armatus*

Write the letter of the correct arthropod next to its name.

Orconectes punctimanus .....

Cancer pagurus .....

Schistocerca gregaria .....

Enantiulus armatus .....

[2]

10 Angelique has bottles of four different solutions, **W**, **X**, **Y** and **Z**.

The bottles have lost their names.

She tests each solution with Universal Indicator.

Here are her results.

solution	colour when Universal Indicator added
W	green
X	yellow
Y	purple
Z	red

(a) Draw a line to match the correct **solution** to its **name**.

solution	name
W	sodium hydroxide (strongly alkaline)
X	distilled water (neutral)
Y	citric acid (weakly acidic)
Z	hydrochloric acid (strongly acidic)

[3]

(b) Which hazard label is put onto a bottle containing a corrosive liquid?

Tick (✓) the correct box.

[1]

11 Ahmed finds this information about six substances.

substance	property
A	high boiling point
B	low melting point
C	gas at room temperature
D	shiny
E	magnetic
F	ductile

(a) Use these properties to sort the **six** substances into metals and non-metals.

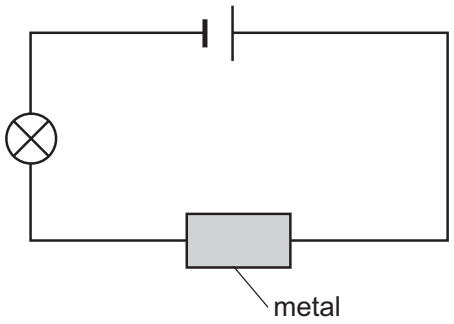
One has been done for you.

metal	non-metal
E	

[2]

(b) Ahmed investigates the electrical conductivity of three metals, **X**, **Y** and **Z**.

Here is his equipment.



Here are his results.

metal	brightness of lamp
X	dim
Y	bright
Z	bright

Ahmed concludes that metals **Y** and **Z** are better electrical conductors than metal **X**.

Suggest an improvement to Ahmed's experiment to find out which is the better electrical conductor, **Y** or **Z**.

Explain your suggestion.

improvement .....

explanation .....

.....

[2]

12 This question is about sound.

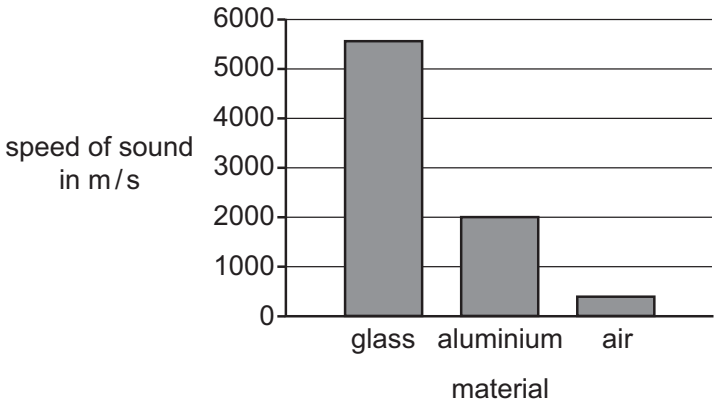
(a) Describe how sound travels through a material.

.....

..... [1]

(b) Look at the bar chart.

It shows the speed of sound through different materials.



(i) Suggest why sound travels quicker through glass than through air.

.....

..... [1]

(ii) Predict the speed of sound through water.

..... m / s

Explain your answer.

.....

..... [2]

(iii) Sound does **not** travel in a vacuum.

Explain why.

.....

..... [1]