Cambridge Assessment International Education

# Science

Stage 7

Paper 2

**2024**

## Cambridge Lower Secondary Progression Test

Name

Class

Date

**45 minutes**

No additional materials are needed.

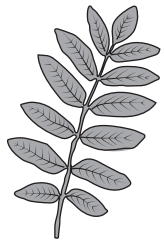
**INSTRUCTIONS**

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

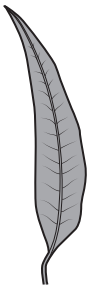
**INFORMATION**

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

**1** The diagram shows leaves from six different species of tree.



species **A**



species **B**

species **C**

species **D**

species **E**

species **F**

**(a)** Write down the meaning of the term **species**.

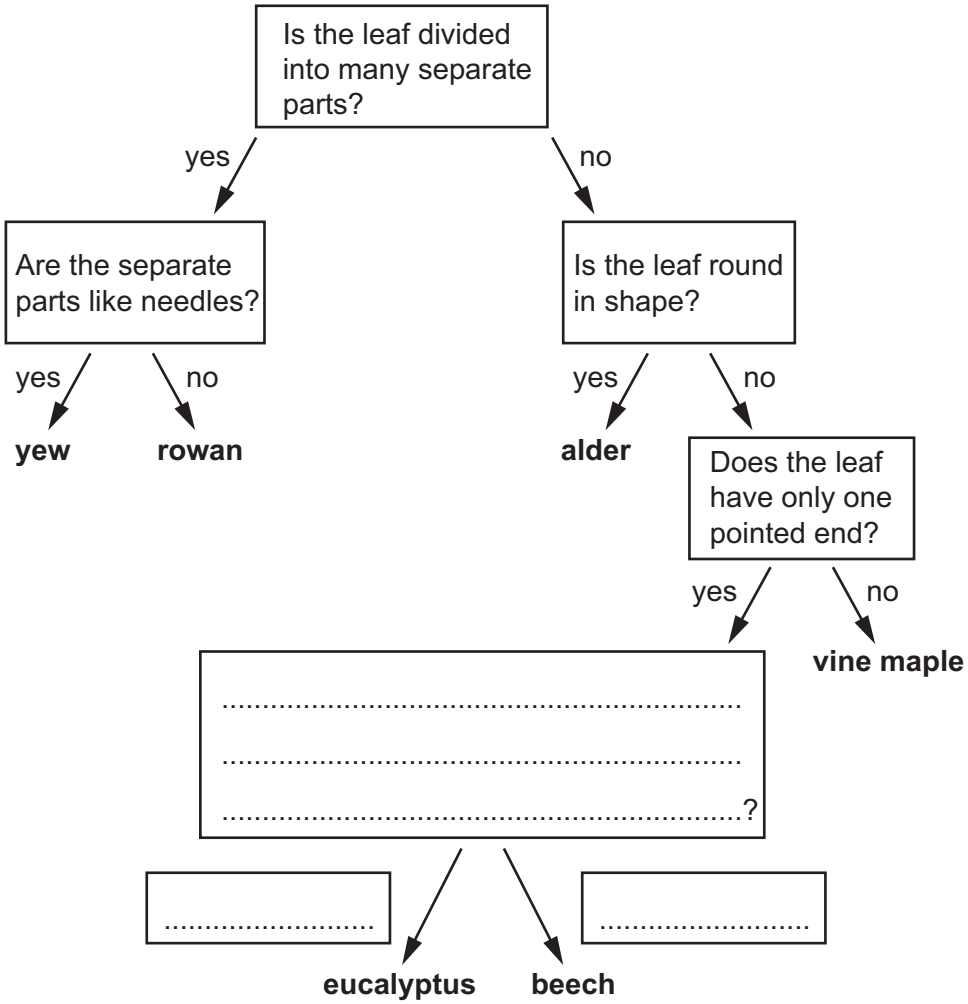
.....

.....

.....

..... [2]

**(b)** Look at the dichotomous key used to identify different species of tree.




**(i)** Use the key to identify species **A**.

Species **A** is **.....**. [1]

**(ii)** The dichotomous key is incomplete.

Species **B** is a eucalyptus tree.

Species **C** is a beech tree.

Complete the **three** empty boxes in the key.

[2]

**2** Metals and non-metals have different physical properties.

Complete the table about metals and non-metals.

| physical property | metal | non-metal |
|---|---|---|
| electrical conductivity | ..... | low |
| thermal conductivity | high | ..... |
| melting point | ..... | low |
| density | high | ..... |

[2]

**3** Gravity is a force.

**(a)** Mike wants to find out if the total mass of two objects affects the force between the objects.

Mike collects information from the internet about the:

- mass of two objects, **A** and **B**
- distance between these two objects
- force between these two objects.

He puts the information in a table.

| mass of object A in kg | mass of object B in kg | distance between object A and object B in m | force between object A and object B in N |
|---|---|---|---|
| 1 | 1 | 1 | 1 |
| 2 | 1 | 1 | 2 |
| 2 | 2 | 1 | 3 |
| 2 | 3 | 1 | 6 |
| 3 | 3 | 1 | 9 |

**(i)** Mike says,

**'This is a fair test.'**

Explain why this is a fair test.

Use information from the table.

.....

..... [1]

**(ii)** Mike notices a mistake with one of the values for the force between objects in N.

This measurement should be 4 N.

Identify the incorrect value.

Explain your answer.

incorrect force between objects in N ..... N

explanation .....

.....

[2]

**(b)** Complete the sentence to describe gravity.

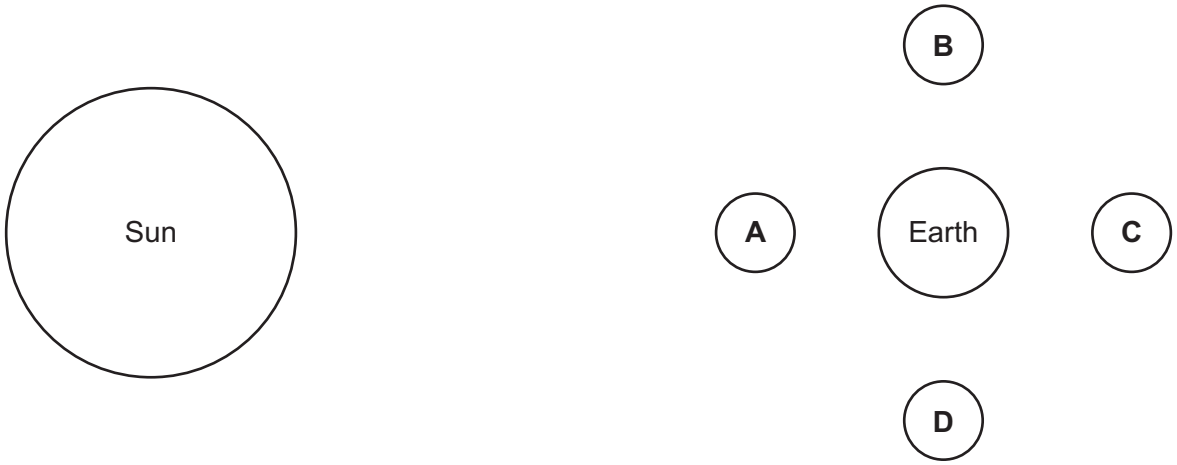
Choose from the list.

**attraction** **mass** **repulsion** **weight**

Gravity is the force of ..... between two objects.

[1]

**4** Several times a year there are solar eclipses on Earth.




NOT TO SCALE

Which position of the Moon causes a solar eclipse?

Circle the correct answer.

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

[1]

**5** The diagram shows part of an ocean food chain.

plankton ⟶ small fish ⟶ squid ⟶ whale

**(a)** Name a herbivore from the food chain.

..... [1]

**(b)** Penguins eat small fish.

Whales eat penguins.

Adding penguins to the food chain makes a food web.

Complete the diagram to make this food web.

plankton ⟶ small fish ⟶ squid ⟶ whale

[2]

**(c)** Microorganisms are also present in the ocean.

Some microorganisms are decomposers.

What is the function of a decomposer in a food web?

.....

..... [1]

**6** Safia reacts some white solid calcium carbonate with dilute hydrochloric acid.

Carbon dioxide, water and a colourless solution of calcium chloride are made in the reaction.

**(a)** Suggest **two** observations Safia makes to confirm a chemical reaction takes place.

1 .....

2 .....

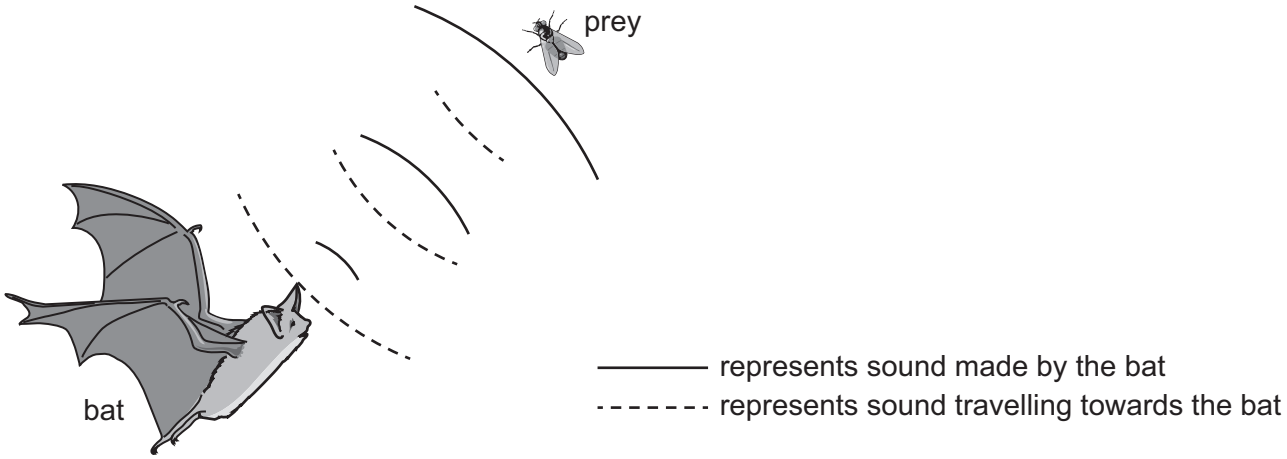
[2]

**(b)** During the reaction the dilute hydrochloric acid is neutralised.

Describe what happens to the pH of the dilute hydrochloric acid.

..... [1]

**7** Echolocation is used by bats to find their prey.




**(a)** Explain how the bat uses echoes to find the prey.

.....

.....

.....

..... [2]

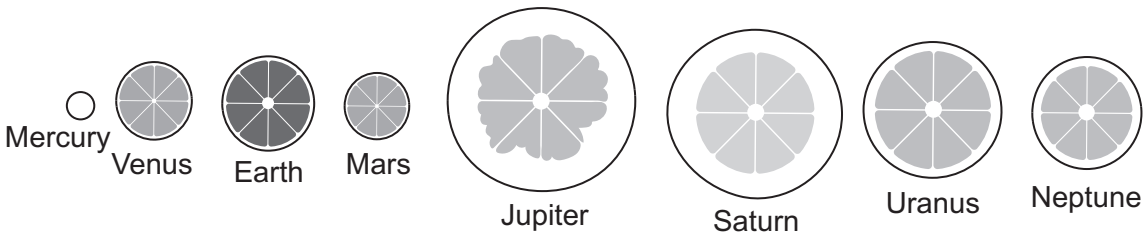
**(b)** The prey moves closer to the bat.

Describe how the bat knows, using echoes, that the prey is closer.

.....

..... [1]

**8** Rajiv uses fruits to model the Solar System.




**(a)** Write down **two** strengths of this model of the Solar System.

1 .....

.....

2 .....

.....

[2]

**(b)** Write down **two** limitations of this model of the Solar System.

1 .....

.....

2 .....

.....

[2]

**9** Three of the characteristics of living organisms are sensitivity, nutrition and movement.

**(a)** Draw a straight line to match each **characteristic** to its correct **description**.

| characteristic | description |
|---|---|
| sensitivity | organisms take in and use nutrients |
| nutrition | organisms increase in number |
| movement | organisms detect changes and respond to them |
| | organisms break down nutrients to release energy |
| | organisms remove nutrients from their bodies |
| | organisms change their position |

[3]

**(b)** Viruses cause disease.

**(i)** Write down **one** reason why some scientists think viruses are **living**.

.....

..... [1]

**(ii)** Write down **one** reason why some scientists think viruses are **non-living**.

.....

..... [1]

**10** Some chemical reactions make a precipitate.

Complete the sentence about reactions that make a precipitate.

A precipitate is made when two ..... reactants make at least one ..... product.

[2]

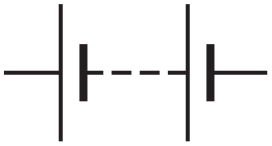
**11** Blessy describes her electrical circuit.

My circuit is a complete **series** circuit with:

- a battery of cells
- two lamps
- one closed switch
- one buzzer
- a meter to measure the current in the whole circuit.

Draw her circuit using standard electrical symbols.

The battery of cells has been drawn for you.



[4]

**12** The atmosphere contains a mixture of gases.

**(a)** What is the percentage by volume of nitrogen in clean dry air?

..... % [1]

**(b)** What is the meaning of the word **mixture**?

.....

.....

..... [2]

**13** Carlos investigates the neutralisation reaction between an acid and an alkali.

In his first experiment Carlos:

- adds 50 $cm^3$ of acid to a beaker
- measures the temperature of the acid
- adds 10 $cm^3$ of alkali to the acid
- stirs the mixture
- measures the highest temperature reached by the mixture.

Carlos repeats the first experiment four more times but uses different volumes of alkali.

Look at his results table.

| volume of alkali added in $cm^3$ | temperature of acid in °C | highest temperature of mixture in °C | change in temperature in °C |
|---|---|---|---|
| 10 | 21 | 26 | 5 |
| 20 | 21 | 31 | 10 |
| 30 | 22 | 37 | 15 |
| 40 | 21 | 40 | 19 |
| 50 | 23 | 47 | ..... |

**(a)** Name the equipment he uses to measure the temperature of the acid and the volume of the acid.

temperature .....

volume .....

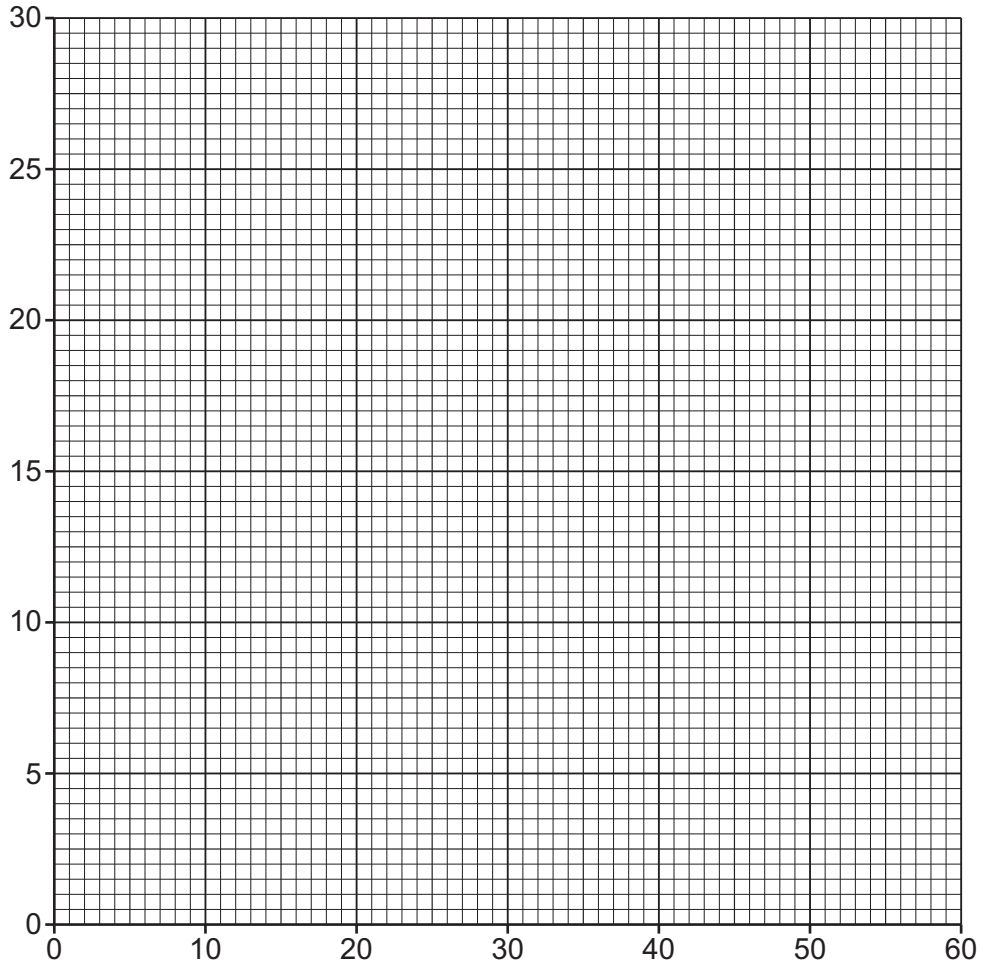
[2]

**(b)** Calculate the change in temperature when Carlos uses 50 $cm^3$ of alkali.

Write your answer in the table. [1]

**(c)** Plot the results on the grid.

Include labels for the axes.




.....

.....

.....

.....

.....

[2]

**(d)** Draw a straight line of best fit. [1]

**(e)** Describe the pattern between the volume of alkali added and the change in temperature.

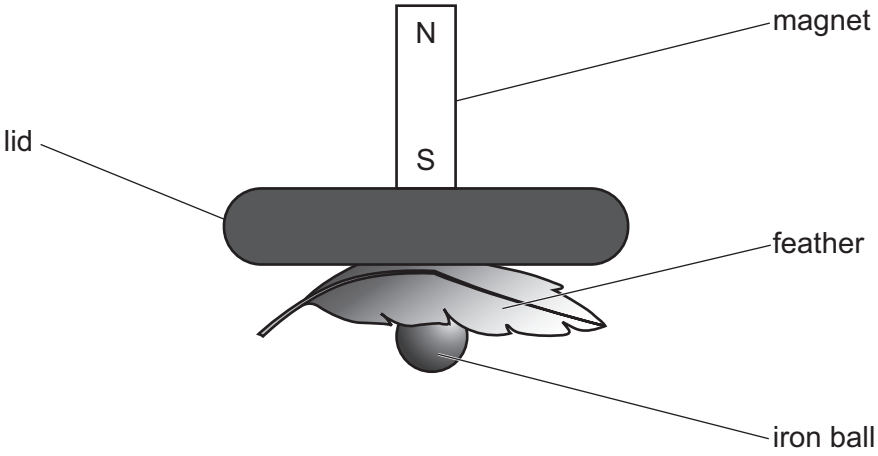
.....

..... [1]

**14** Angelique investigates how objects fall.

Angelique:

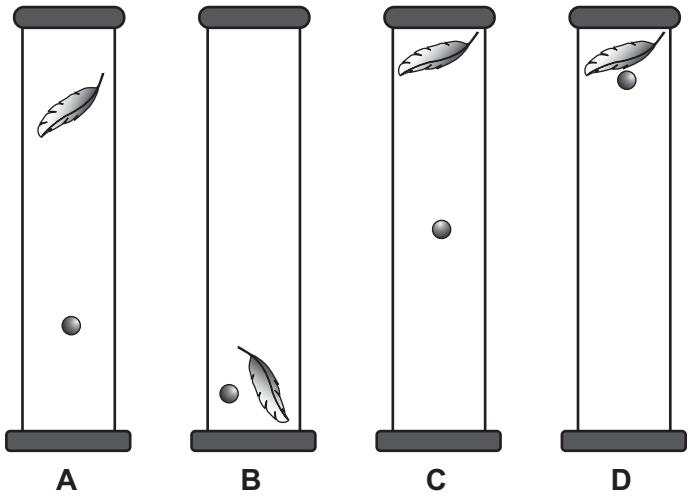
- uses a magnet to attach an iron ball and a feather to the bottom of a lid




- puts the lid on top of a tube to seal the tube
- removes the magnet so the ball and feather fall at the same time
- repeats this with different contents inside the sealed tube.

Angelique takes a photograph of each tube 0.5 s after the magnet is removed.

The position of the ball and feather in the photographs are shown in the diagrams.



**(a)** One tube is a vacuum, the other tubes contain either **air** or **thick oil** or **water**.

Complete the sentences.

Choose from the list.

**air** **thick oil** **water**

One has been done for you.

Tube **A** contains .....air.....

Tube **B** is a vacuum.

Tube **C** contains .....thick oil.....

Tube **D** contains .....water.....

[1]

**(b)** Explain the results for diagram **B** (the vacuum).

.....

.....

..... [2]