Cambridge Assessment International Education

Science

Stage 8

Paper 2

2023

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 table shows information about four different adults who play sports.

The adults are the same age and the same height.

adults	physical activity level	do they smoke?
W	low	no
X	high	no
Y	high	yes
Z	low	yes

(a) (i) Which adult, **W**, **X**, **Y** or **Z**, is most likely to have health problems?

.....

[1]

(ii) The four adults test their fitness by exercising.

After exercising, they measure their pulse rate.

What do they do to make the test fair?

Tick (✓) the correct answer.

two adults run and two adults walk for 5 minutes	☐
use a ruler to measure distance	☐
all four adults run at the same speed for 1 minute	☐
repeat the exercise four times	☐

[1]

(b) (i) Adult **Y** takes a vitamin A tablet every morning.

What is the function of vitamin A?

.....

[1]

(ii) Adult **Z** eats a diet that has a very high fat content.

Write down **one** health problem caused by this type of diet.

.....

[1]

2 Aiko reacts iron with dilute sulfuric acid.

She takes the temperature of the dilute sulfuric acid before she adds the iron.

She takes the temperature of the reaction mixture at the end of the reaction.

Look at her results.

temperature of dilute sulfuric acid at start = 18°C
temperature of reaction mixture at end = 28°C

(a) Write down the **type** of reaction between iron and dilute sulfuric acid.

Choose from the list.

endothermic **exothermic** **neutralisation** **precipitation**

type of reaction .....

Explain your answer.

.....

.....

[2]

(b) Iron reacts with sulfuric acid.

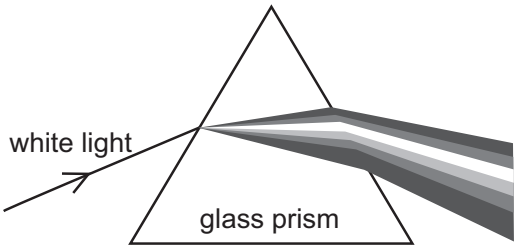
Iron sulfate and hydrogen are made.

Write down the **word** equation for this reaction.

..... [1]

3 White light is made of many colours.

(a) Oliver uses a glass prism and a ray of white light.



Complete the sentences.

A ray of white light enters the glass prism.

This ray of white light changes speed because the light is ..... .

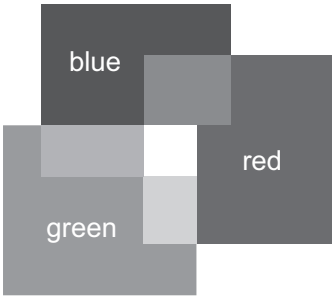
White light is split into different colours by the process of ..... .

[2]

(b) Oliver adds different colours of light together.

Complete the additions of light.

One has been done for you.



red + blue = magenta

red + green = ...

green + blue = ...

red + blue + green = ...

[2]

4 Name **two** objects that are found in all known galaxies.

K

1 .....

2 .....

[2]

5 The picture shows a woodland ecosystem.

K

(a) One habitat shown in the woodland ecosystem is tree roots.

Name **two other** habitats shown in the picture.

1 .....

2 .....

[2]

(b) Jamila observes a new species of bird in the woodland.

She makes a hypothesis,

'The new species of bird reduces the number of other species of bird in the woodland.'

Jamila counts the number of species of bird in the woodland.

Six months later, she counts the number of species of bird in the same place in the woodland.

(i) Write down **one other** factor she must keep the same during both counts.

.....

[1]

(ii) What is the dependent variable?

.....

[1]

(iii) Look at Jamila's table of results.

count number	number of species of bird
1	14
2	12

Do these results support her hypothesis?

.....

Give **two** reasons for your answer.

1 .....

.....

2 .....

.....

[2]

6 Look at the table showing the reactions of some metals with cold water and with dilute hydrochloric acid.

metal	reaction with cold water	reaction with dilute hydrochloric acid
A	no reaction	no reaction
B	floats on water, reacts quickly and gives off a gas	floats on acid, reacts very quickly and gives off a gas
C	reacts slowly and gives off a gas	reacts quickly and gives off a gas
D	no reaction	reacts slowly and gives off a gas

Look at this list of metals.

calcium **gold** **magnesium** **sodium** **zinc**

(a) Identify the metals **A**, **B**, **C** and **D**.

Choose from the list.

Metal **A** is ..... .

Metal **B** is ..... .

Metal **C** is ..... .

Metal **D** is ..... .

[3]

(b) Write down the name of the gas made when metals **B** and **C** react with water.

..... [1]

7 Lily uses this equipment to make an electromagnet.

battery copper wire iron nail

(a) Describe how Lily makes an electromagnet.

.....

.....

..... [2]

(b) Which of these changes **increase** the strength of her electromagnet?

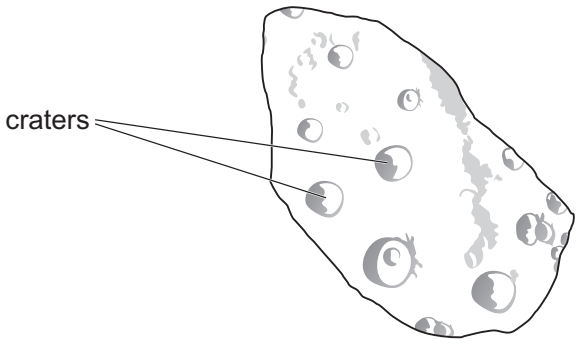
Tick (✓) the **two** correct answers.

cover the copper wire in plastic	☐
use a non metal for the wire	☐
use two batteries	☐
remove the iron nail	☐
increase the current	☐
connect the equipment for a shorter time	☐

[2]

8 The picture shows an asteroid.

Asteroids are found in space.



(a) (i) What is an asteroid?

.....

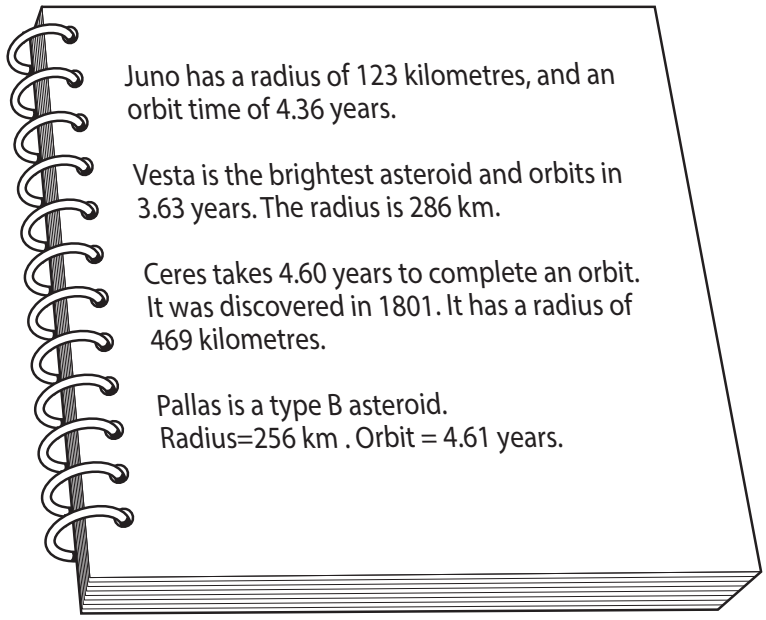
..... [1]

(ii) Suggest how craters are made on asteroids.

.....

..... [1]

(b) Pierre writes down some information about four asteroids.



He draws a table to show the information more clearly.

(i) Present his information on orbit time and radius for each asteroid in the table.

[3]

(ii) All four asteroids travel the same distance in one year.

Which asteroid travels at the **greatest** mean speed?

..... [1]

9 This question is about aerobic respiration.

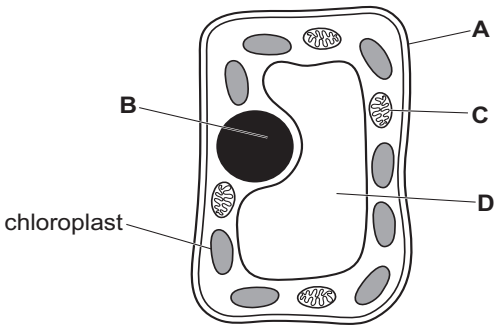
(a) Write down the **word** equation for aerobic respiration.

..... + ... → ..... + ...

....

[2]

(b) Carlos draws a diagram of a plant cell.



Where does aerobic respiration happen in this cell?

Choose from the letters **A**, **B**, **C** or **D**.

letter ..... [1]

10 Blessy dissolves salt in water to make a salt solution.

She makes four solutions.

Look at the quantities she uses.

solution	mass of salt in g	volume of water in cm^3
A	1	10
B	6	30
C	5	20
D	10	50

(a) Which solution is the **most** concentrated?

Circle the correct answer.

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

Explain your answer.

.....

.....

[2]

(b) Describe how the solubility of salt changes as the temperature increases.

.....

[1]

11 Ahmed has time and distance measurements for a bicycle journey.

time in s	distance in m
0	0
20	60
40	240
60	420
80	600
100	760

(a) Write down the equipment he uses to make these measurements.

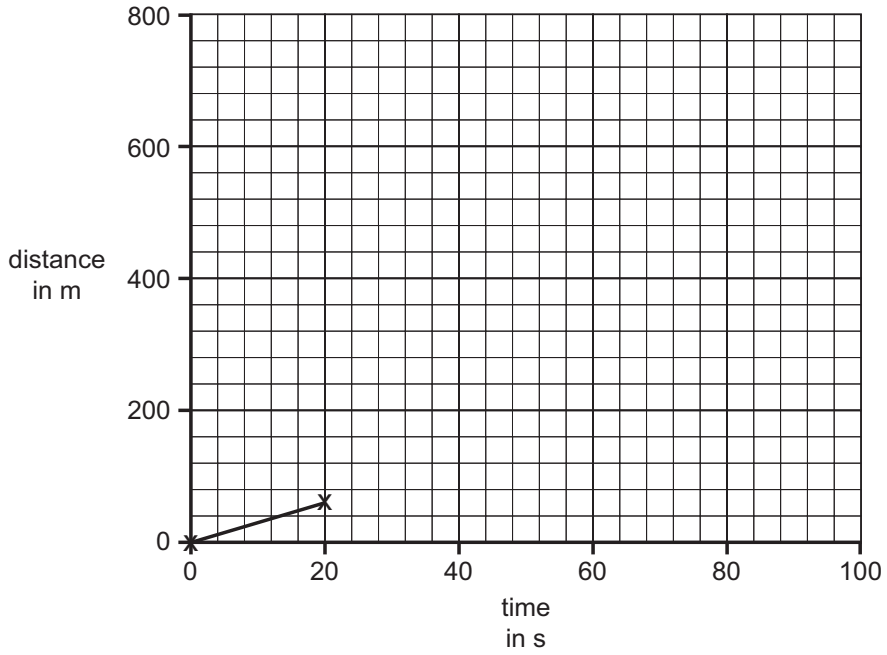
time to measure 20 s .....

distance to measure 60 m .....

[2]

(b) Complete the graph by:

- plotting the other four points
- drawing a line to connect the points.



[2]

(c) Calculate the speed when a distance of 60 m is travelled in 20 s.

Use the equation shown.

$$\text{speed} = \frac{\text{distance}}{\text{time}}$$

speed = ... m / s

[1]

12 Here are some sentences about climate and weather.

Tick (✓) each correct sentence.

Climate is the day to day changes in the atmosphere.	☐
Climate changes over a long period of time.	☐
Weather changes over a short period of time.	☐
Weather gives information about the atmosphere.	☐

[2]

13 Priya uses chemical formulae to model chemical compounds.

The chemical formula of sodium carbonate is Na_2CO_3.

The formula of sodium carbonate contains:

- 2 atoms of sodium, Na
- 1 atom of carbon, C
- 3 atoms of oxygen, O.

(a) The formula of carbon dioxide contains:

- 1 atom of carbon, C
- 2 atoms of oxygen, O.

Write down the chemical formula for carbon dioxide.

formula ..... [1]

(b) The formula of nitric acid contains:

- 1 atom of hydrogen, H
- 1 atom of nitrogen, N
- 3 atoms of oxygen, O.

Write down the chemical formula of nitric acid.

formula ..... [1]

(c) Look at the word equation.

sodium carbonate + nitric acid ⟶ sodium nitrate + carbon dioxide + water

The formula of sodium nitrate is $NaNO_3$.

The formula of water is H_2O.

Write down the **symbol** equation for this reaction.

..... [2]