



# Cambridge Lower Secondary Progression Test

## Science paper 1

### Stage 9



**45 minutes**

Name .....

Additional materials:      Calculator  
   Ruler

**READ THESE INSTRUCTIONS FIRST**

Answer **all** questions in the spaces provided on the question paper.

You should show all your working on the question paper.

The number of marks is given in brackets [ ] at the end of each question or part question.

The total number of marks for this paper is 50.

For Teacher's Use	
Page	Mark
1	
2	
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16	
<b>Total</b>	

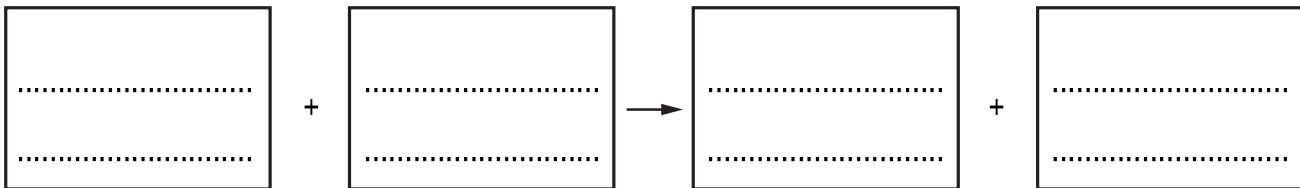
1 The diagram shows a plant with variegated leaves.

Some areas of the leaves are green and some are white.



(a) Plants use photosynthesis to make food so they can grow.

Complete the **word** equation for photosynthesis.



[2]

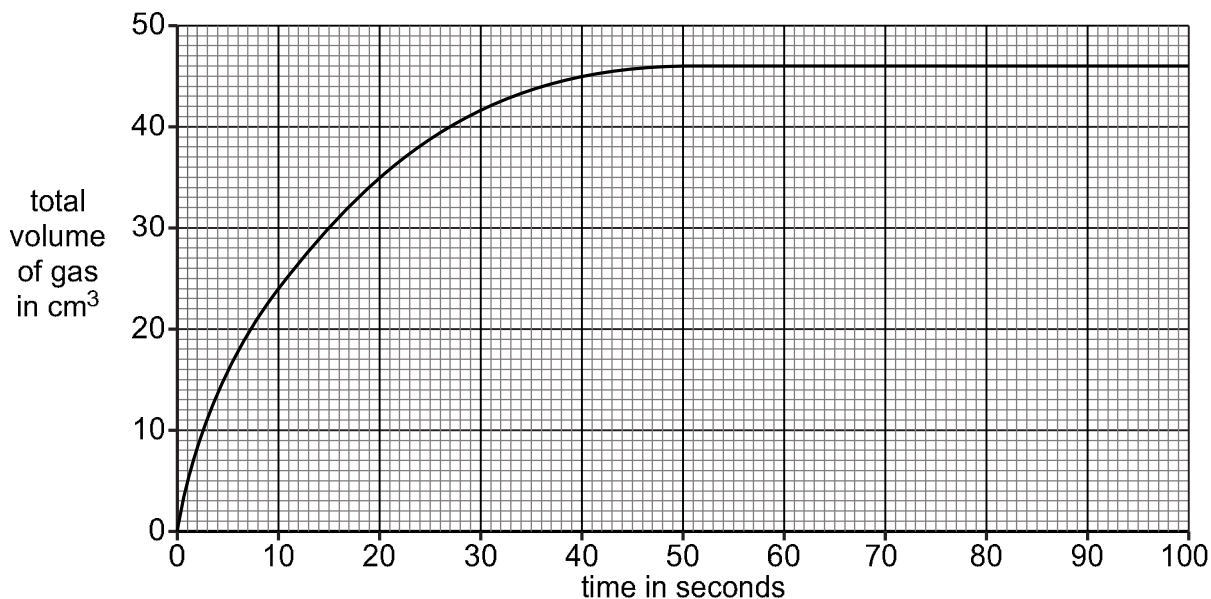
(b) This plant with variegated leaves does **not** grow as fast as another plant with only green leaves.

Suggest a reason for this.

.....[1]

2 The graph shows the volume of gas made during a chemical reaction involving an acid.

For  
Teacher's  
Use



(a) Complete the sentences to describe the pattern shown on the graph.

Between 0 and 48 seconds the volume of gas .....

After 48 seconds the reaction ..... [2]

(b) The experiment is repeated using a **lower** concentration of acid.

All other factors are kept the same.

What happens to the rate of reaction when the concentration of acid is **lower**?

..... [1]

(c) Increasing the temperature will increase the rate of reaction.

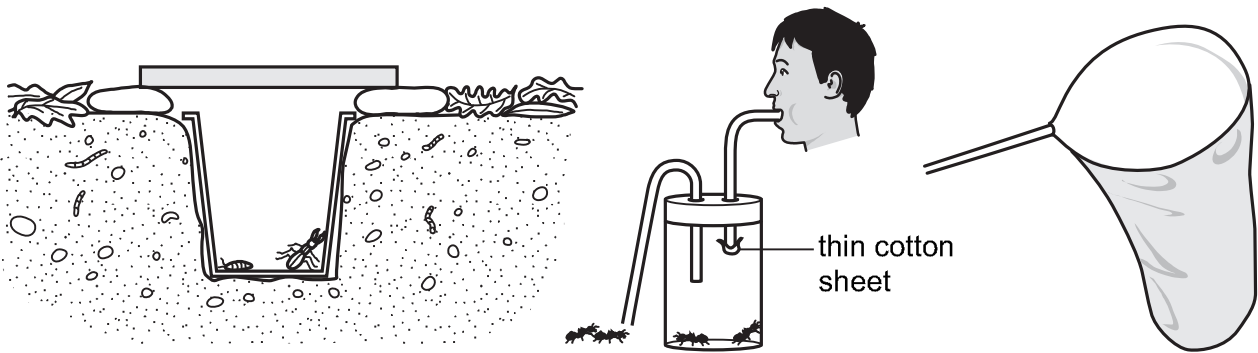
Explain why.

Use ideas about particles and collisions in your answer.

.....  
 .....  
 ..... [2]

3 A class investigates food chains.

They plan to sample insects in their school grounds using pitfall traps, pooters and sweep nets.



pitfall trap

pooter

sweep net

(a) (i) Draw a line from each piece of **collecting equipment** to the **type of insect** the class plans to sample.

**collecting equipment**

**type of insect**

pitfall traps

flying insects

pooters

insects crawling on plants

sweep nets

insects in leaf litter which are active at night

[1]

(ii) The class want to estimate the number of insects in their school grounds.

Describe how they can make the estimate reliable.

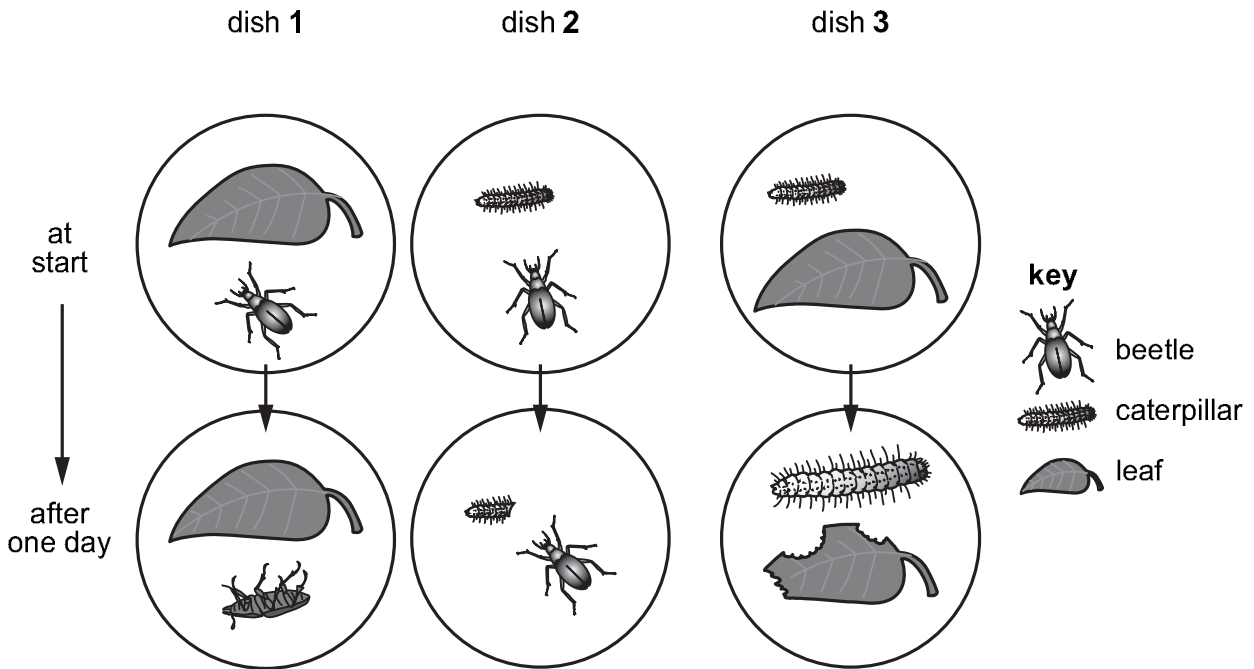
..... [1]

(iii) Carlos and Blessy use a pooter.

Describe one possible safety risk of using a pooter.

..... [1]

(b) The students investigate a food chain involving beetles, caterpillars and leaves.  
They set up three dishes.  
They look at the dishes after one day.  
The diagram shows the results of their investigation.



(i) Complete the food chain for the three organisms.

.....

.....

.....

[2]

(ii) Explain how you worked out your answer from the results in each dish.

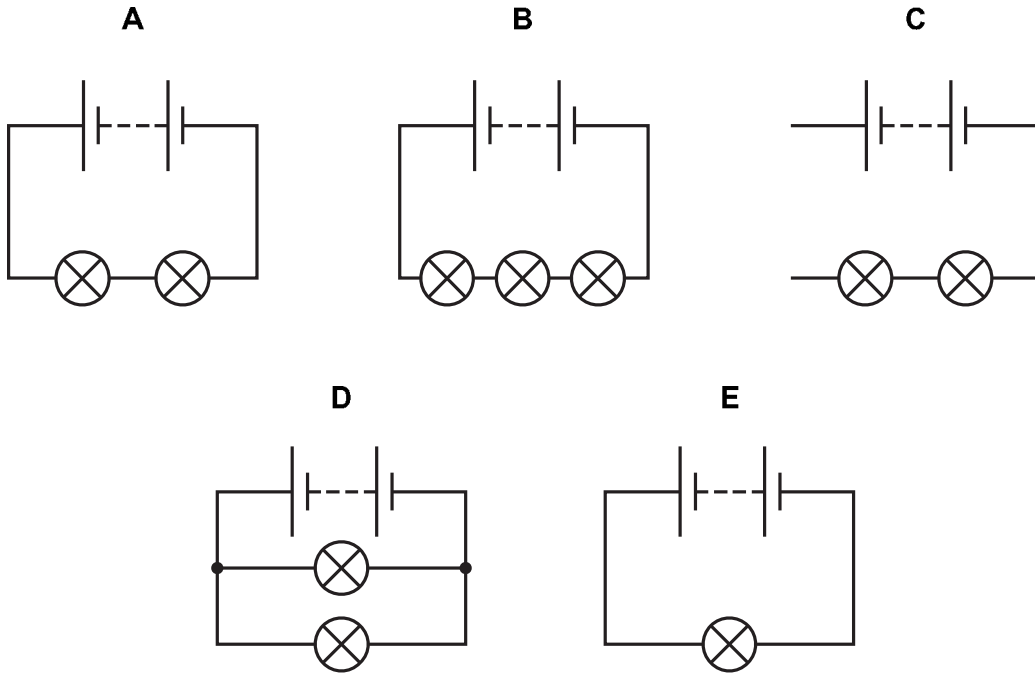
dish 1 .....

dish 2 .....

dish 3 .....

[2]

4 Look at the circuit diagrams.



(a) Complete the table.

Put ticks (✓) into the correct columns.

circuit	parallel	series	does not work
A			
B			
C			
D			
E			

[3]

(b) All the lamps are identical.

All the batteries are identical.

Which **two** circuits have lamps with the **same** brightness?

..... and .....

Explain why.

.....

..... [2]

5 Look at the diagram. It shows some of the elements in the Periodic Table.

			H							He
Li	Be			B	C	N	O	F	Ne	
Na	Mg			Al				Cl		
K	Ca	transition elements								

(a) Use this Periodic Table to answer these questions.

(i) Write down the chemical symbol of the most reactive element in **Group 2**.

.....[1]

(ii) Write down the chemical symbol of the atom with only **six electrons**.

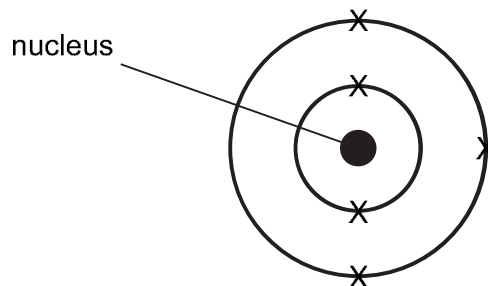
.....[1]

(b) Look at the elements in **Period 2** of the Periodic Table.

Write down the chemical symbol of the element with the **most protons** in each atom.

.....[1]

(c) Look at the diagram of an atom of an element.



(i) To which **group** of the Periodic Table does this element belong?


.....[1]

(ii) What is the number of **protons** in the nucleus of this atom?

.....[1]

6 Youssef has four varieties of goldfish.

Here is a key for the varieties.

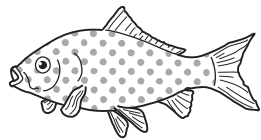
**A** =  spotted

**B** =  dark

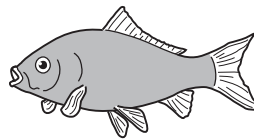
**C** =  light

**D** =  striped

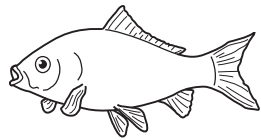
Here are Youssef's four varieties of goldfish.



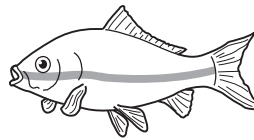
**A**



**B**



**C**



**D**

(a) Youssef wants a new variety that has spots **and** stripes.

Which **two** fish does he breed?

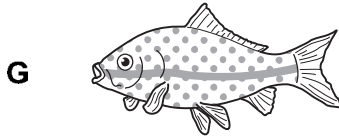
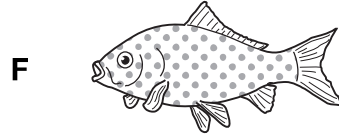
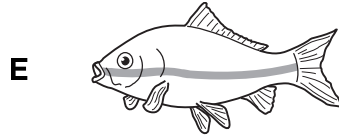
Choose from **A, B, C** and **D**.

..... and .....

[1]



(b) Here is a diagram of the three varieties of offspring.



What should he do now to get more of the variety that have spots and stripes?

.....  
..... [2]

7 The density of any solid, liquid or gas can be calculated.

(a) A solid has a mass of 12 g.

It has a volume of 3.2 cm<sup>3</sup>.

Calculate the density.

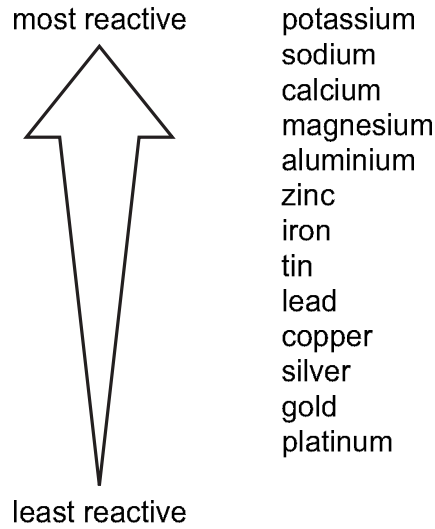
.....  
.....

density of solid ..... [3]

(b) What is the unit of the density you have calculated in part (a)?

unit ..... [1]

8 Look at the diagram. It shows some metals in order of reactivity.



Use the diagram and your scientific knowledge to answer these questions.

(a) Some metals displace other metals from their compounds.

Which **two** combinations of metal and compound give a displacement reaction?

Tick (✓) the **two** correct answers.

- copper and lead chloride
- lead and silver nitrate
- magnesium and sodium chloride
- tin and copper chloride
- zinc and magnesium nitrate

[2]

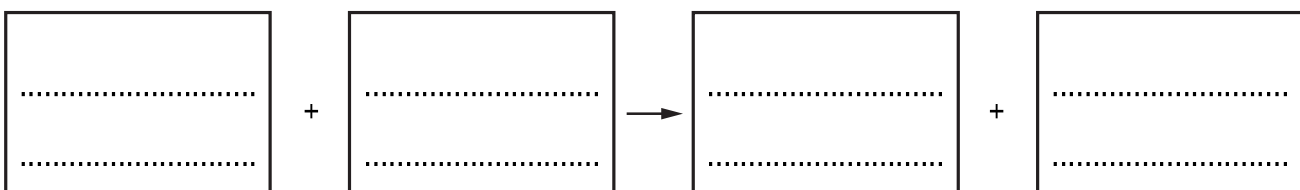
(b) (i) Calcium reacts with cold water.

Write down the name of one **other** metal that reacts with cold water.

.....[1]

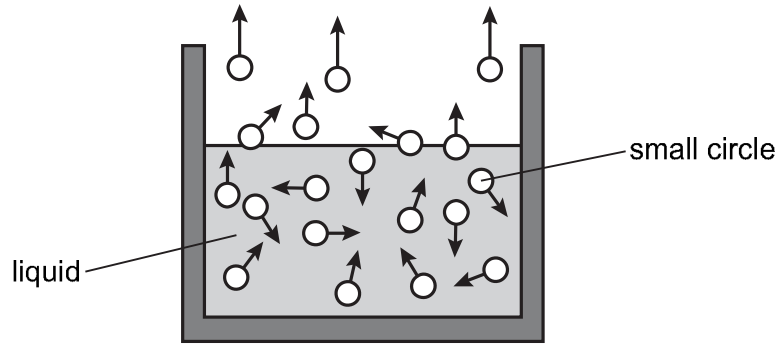
(ii) When calcium reacts with water an alkali and a gas are produced.

Complete the word equation for the reaction between calcium and water.



[2]

9 Carlos draws a diagram to show evaporation.



(a) What do the small circles represent?

..... [1]

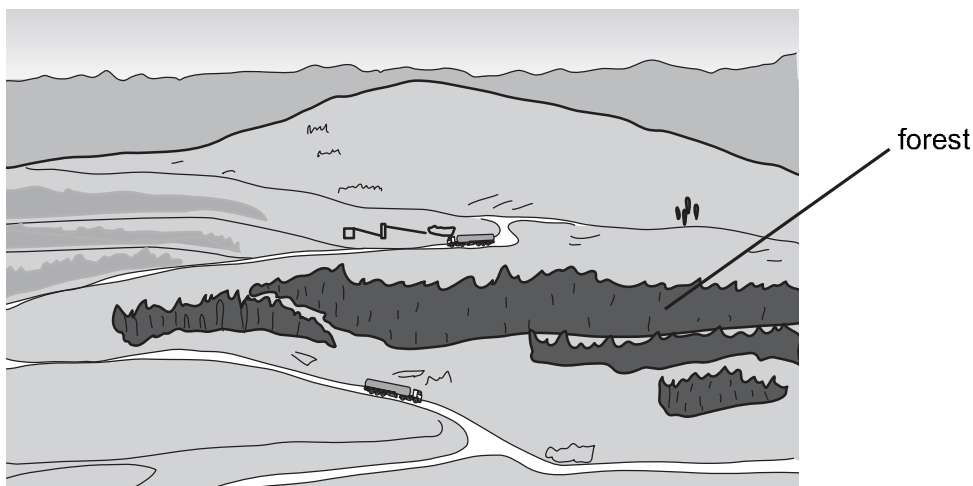
(b) What do the arrows represent?

..... [1]

(c) Explain how evaporation causes the liquid to cool down.

.....  
 .....  
 ..... [2]

10 A new road is built through a forest.



Many trees must be removed to build the road.

(a) Removing trees changes the amounts of some gases in the atmosphere.

(i) Complete the sentence.

When trees are removed the amount of carbon dioxide .....

and the amount of oxygen ..... [1]

(ii) Explain your answer.

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

(b) Animal populations decrease when the trees are removed.

Give **two** reasons why.

1 .....

2 ..... [2]

- 11 Mia decides to make a salt called calcium nitrate.

Mia adds calcium carbonate to dilute nitric acid.

The sentences **A** to **E** describe part of the method she uses.

Complete sentences **B** and **D**.

- A** An excess of calcium carbonate is added to dilute nitric acid.
- B** The excess insoluble calcium carbonate is removed by .....
- C** The filtrate is put into an evaporating dish.
- D** The filtrate is heated until the first ..... appear.
- E** The solution is left to crystallise. [2]

- 12 A class is given some questions about pressure.

Their teacher gives them an equation to help them.

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

Answer the questions.

- (a) A force of 200 N acts on an area of 2 m<sup>2</sup>.

- (i) What is the pressure?

..... N/m<sup>2</sup> [1]

- (ii) The same 200 N force acts on an area **greater** than 2 m<sup>2</sup>.

What happens to the pressure?

..... [1]

- (b) A force of 100 N causes a pressure of 25 N/m<sup>2</sup>.

What area does it act on?

..... m<sup>2</sup> [1]



