Cambridge Assessment International Education

Science

Stage 8

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 [ ].

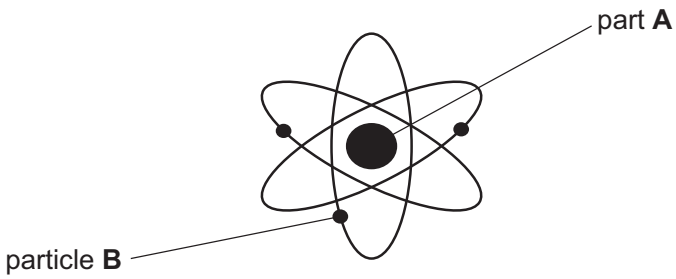
1 Draw a line from each **nutrient** to its correct **function**.

nutrient	function
protein	good eyesight
fat	source of energy
vitamin A	growth and repair
calcium	stong teeth and bones

[3]

2 Look at the diagram.

It shows the Rutherford model of the structure of the atom.



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

.....

[1]

(b) Write down the name of particle **B**.

.....

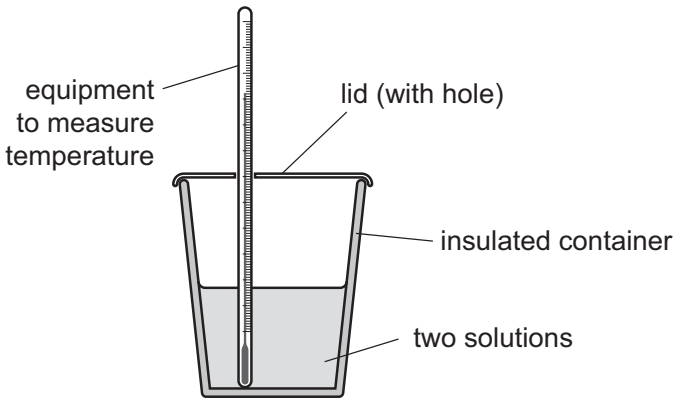
[1]

(c) Write down the charge on particle **B**.

.....

[1]

3 Blessy reacts two solutions together.



She notices that the temperature increases during the reaction.

(a) Write down the name of the **type** of reaction that gives an increase in temperature.

.....

[1]

(b) Blessy repeats her experiment with different solutions.

She measures the temperature at the start and at the end of each reaction.

Look at her results.

reaction	temperature at start in °C	temperature at end in °C
A	20	41
B	18	38
C	15	40

Reaction **C** gives out the most energy.

Explain how you can tell from the results.

.....

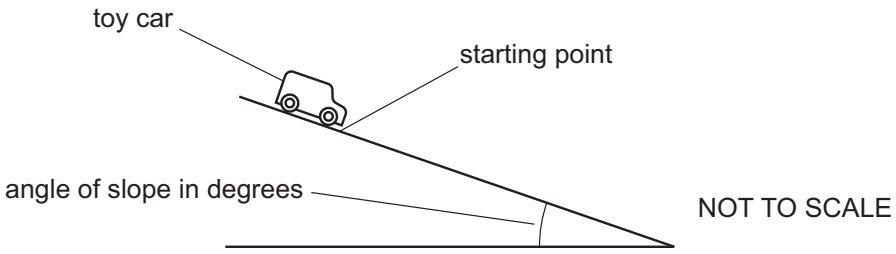
.....

[1]

4 Chen wants to calculate the average speed of a toy car travelling down a slope.

He releases the car from the starting point.

He does **not** push the car.



(a) Chen takes measurements of distance and time.

Write down the names of the pieces of equipment Chen uses to measure distance and time.

distance .....

time .....

[2]

(b) Describe how Chen uses the distance and the time to calculate the average speed of the toy car.

..... [1]

(c) Chen repeats the investigation using different angles of the slope.

Look at his results.

angle of slope in degrees	distance in metres	time in seconds	average speed in m / s
10	1.0	1.6	0.63
20	1.0	2.0	0.50
30	1.0	1.1	0.91

Chen makes a prediction,

'The greater the angle of the slope, the greater the speed of the car.'

Give **one** reason why Chen's results support his prediction and **one** reason why Chen's results do **not** support his prediction.

support his prediction .....

.....

do **not** support his prediction .....

.....

[2]

5 Lily and Mia measure the temperature of the air on the same day every week for 5 weeks.

Look at their results.

week	temperature in °C
1	18.0
2	18.5
3	19.2
4	20.0
5	21.0

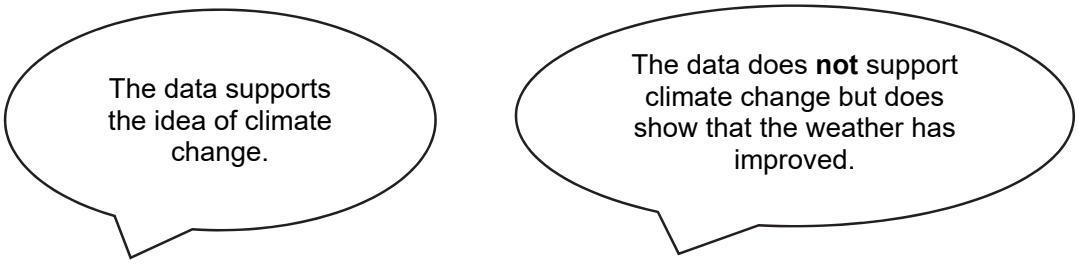
(a) Write down the name of the piece of equipment Lily and Mia use to measure temperature.

..... [1]

(b) Write down a different way to present the data from the table.

..... [1]

(c) Lily and Mia make these conclusions.



Lily says,

Mia says,

Who is correct? .....

Explain your answer.

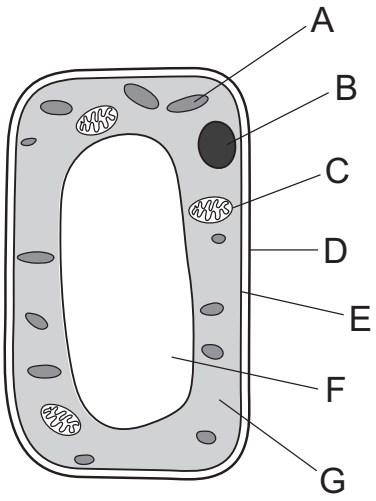
.....

.....

.....

..... [2]

6 Look at the diagram of a plant cell.



(a) Circle the letter that shows the part of the cell where respiration takes place.

A **B** **C** **D** **E** **F** **G** [1]

(b) Write down the name of the part of the cell where respiration takes place.

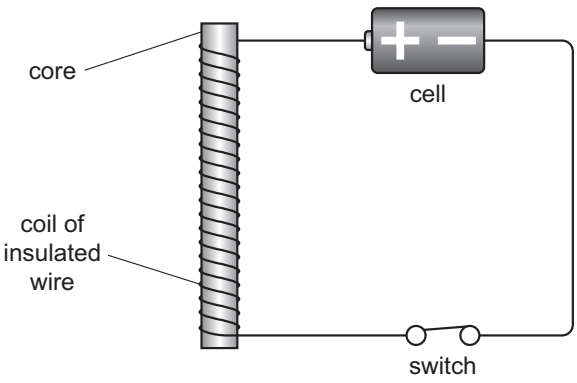
..... [1]

(c) Respiration is important for all living organisms.

Explain why.

..... [1]

7 Pierre makes an electromagnet.



(a) Write down the material Pierre uses to make the core.

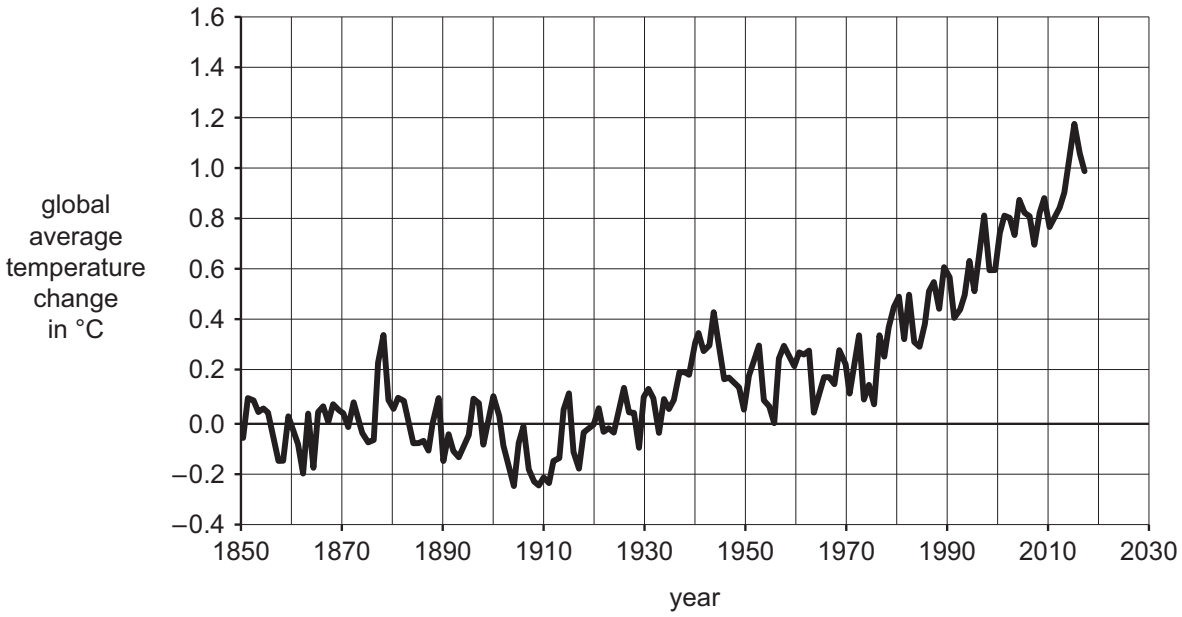
..... [1]

(b) Increasing the number of turns of wire around the core makes the electromagnet stronger.

Write down **one other** change Pierre makes to increase the strength of his electromagnet.

..... [1]

8 Look at the graph showing global average temperature change from 1850.



(a) Describe the pattern shown in the graph.

.....

.....

..... [2]

(b) Scientists believe that this pattern in temperature change is caused by an increase in the concentration of a gas in the atmosphere.

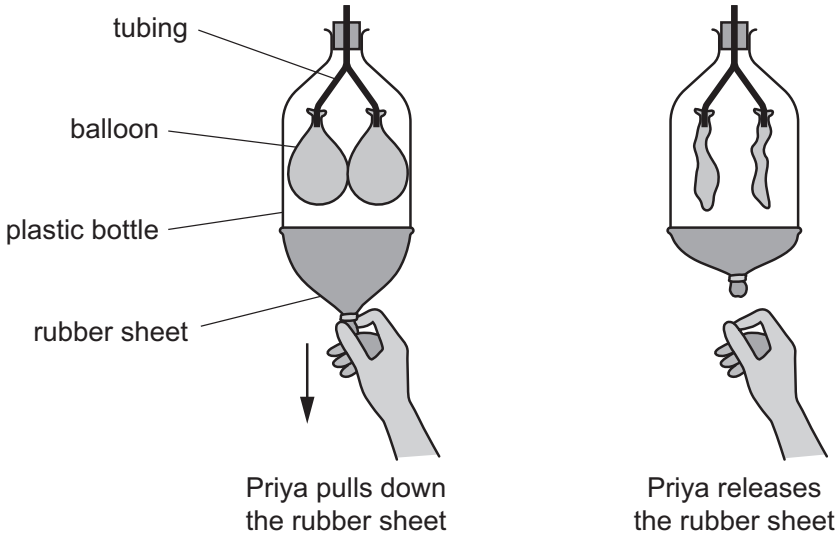
Write down the name of this gas.

..... [1]

(c) Predict the global average temperature change for the year 2030.

..... °C [1]

9 Priya is using an analogy to learn about an organ system.



(a) Circle the correct organ system the analogy represents.

reproductive **nervous** **respiratory** **circulatory** **excretory** [1]

(b) What is meant by the word analogy?

.....

..... [1]

(c) Write down **one** way Priya uses the analogy to learn about the organ system.

.....

..... [1]

10 Mike investigates some sugar solutions.

He dissolves different masses of sugar in different volumes of water.

Look at his results.

solution	mass of sugar in g	volume of water in cm^3
A	0.5	10
B	1.0	25
C	6.0	20
D	2.0	40

(a) Calculate the concentration of sugar in solution **C** in g / 100 cm^3.

concentration = ... g / 100 cm^3 [1]

(b) Which solution has the **fewest** sugar particles in 100 cm^3 of the solution?

.....

Explain your answer using information from the table.

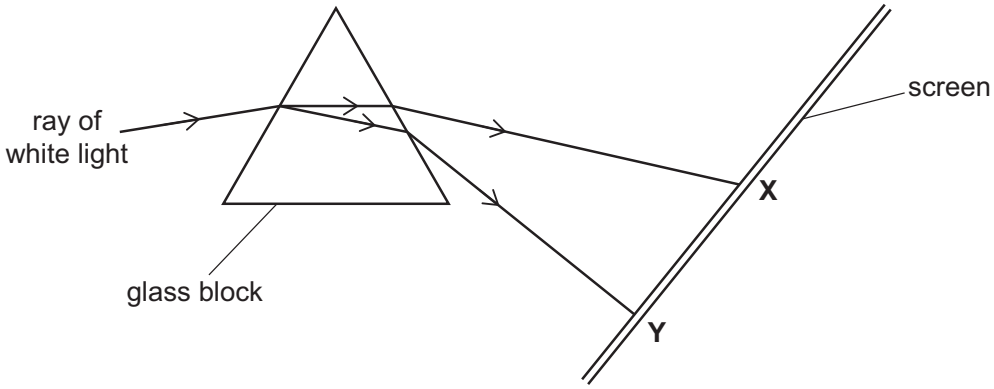
.....

.....

[2]

11 Look at the diagram.

It shows how white light is split into different colours.



(a) Circle the name of the process that splits white light into different colours.

absorption **dispersion** **reflection** **subtraction** [1]

(b) Only two light rays are shown on the diagram.

X is the path of red light.

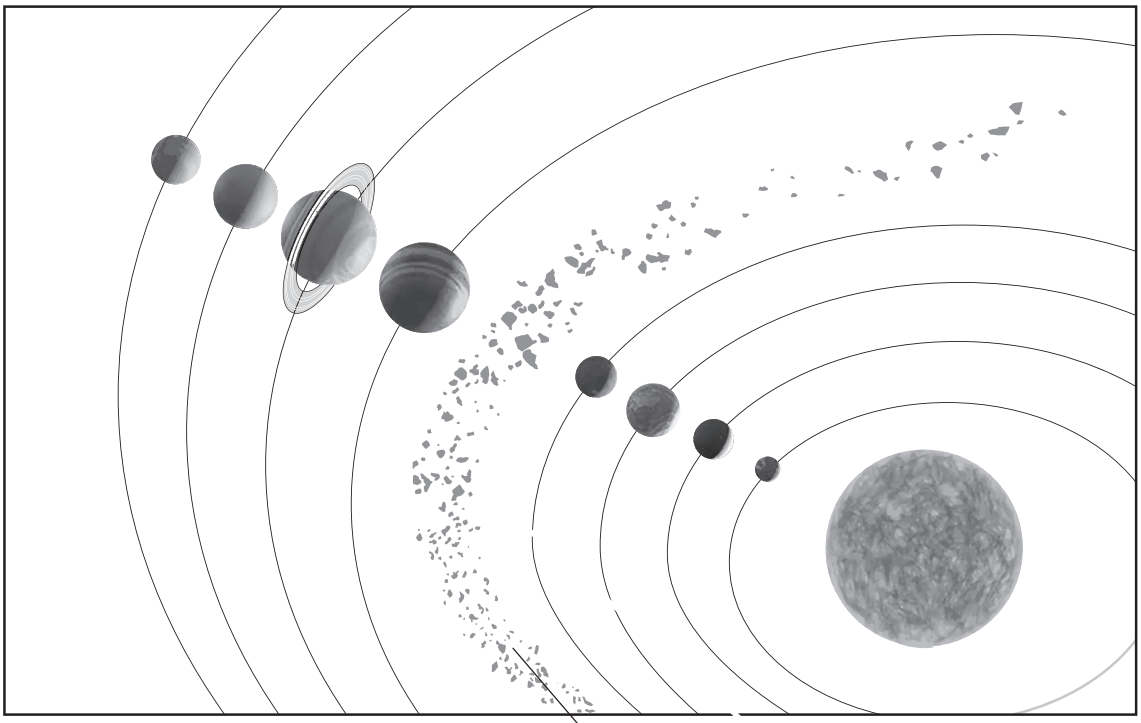
Y is the path of violet light.

Draw the path of a ray of **yellow** light on the diagram. [1]

(c) Complete the sentence to explain the different paths of red light and violet light.

Red light travels at a ..... speed inside the glass block than violet light. [1]

12 Look at the diagram of the Solar System.



NOT TO SCALE

(a) Write down the name of the objects labelled **X** in the diagram.

..... [1]

(b) What are these objects made from?

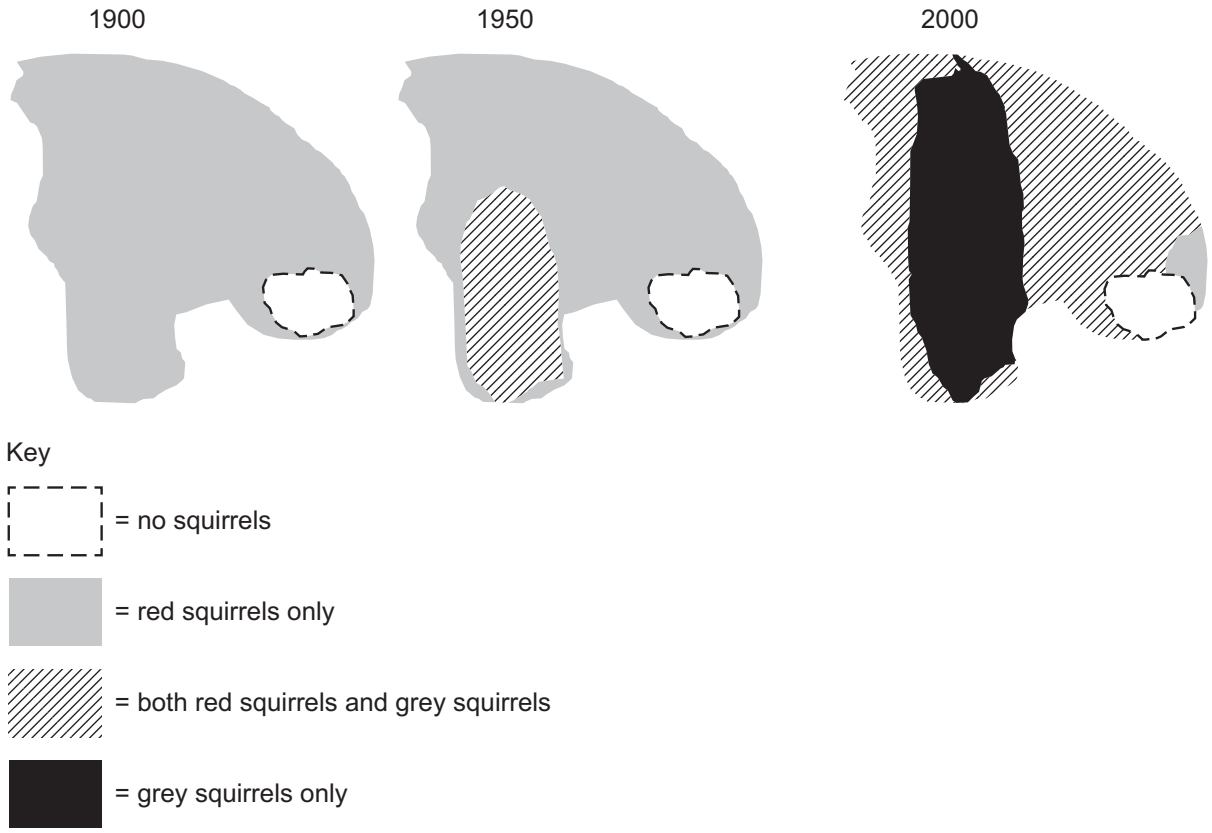
..... [1]

13 In 1900 only red squirrels lived on an island.

At the end of that year grey squirrels were introduced onto the island.

Look at the maps.

They show where the red squirrels and grey squirrels lived on the island.



(a) The size of the areas where the red squirrels and grey squirrels live changes between 1900 and 2000.

Describe the changes in the size of these areas.

red squirrels only area .....

both red squirrels and grey squirrels area .....

grey squirrels only area .....

[2]

(b) Suggest **two** reasons why these changes happened.

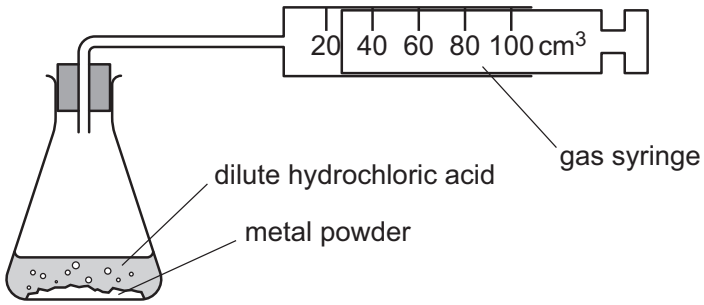
1 .....

2 .....

[2]

14 Carlos investigates the reaction of metal powders with dilute hydrochloric acid.

Look at his equipment.



Carlos measures the time it takes to collect 100 cm^3 of hydrogen in the gas syringe.

Carlos does four experiments.

Each time he uses a different metal powder.

He makes certain the experiments are fair.

(a) Describe **two** ways that Carlos makes his experiments fair.

1 .....

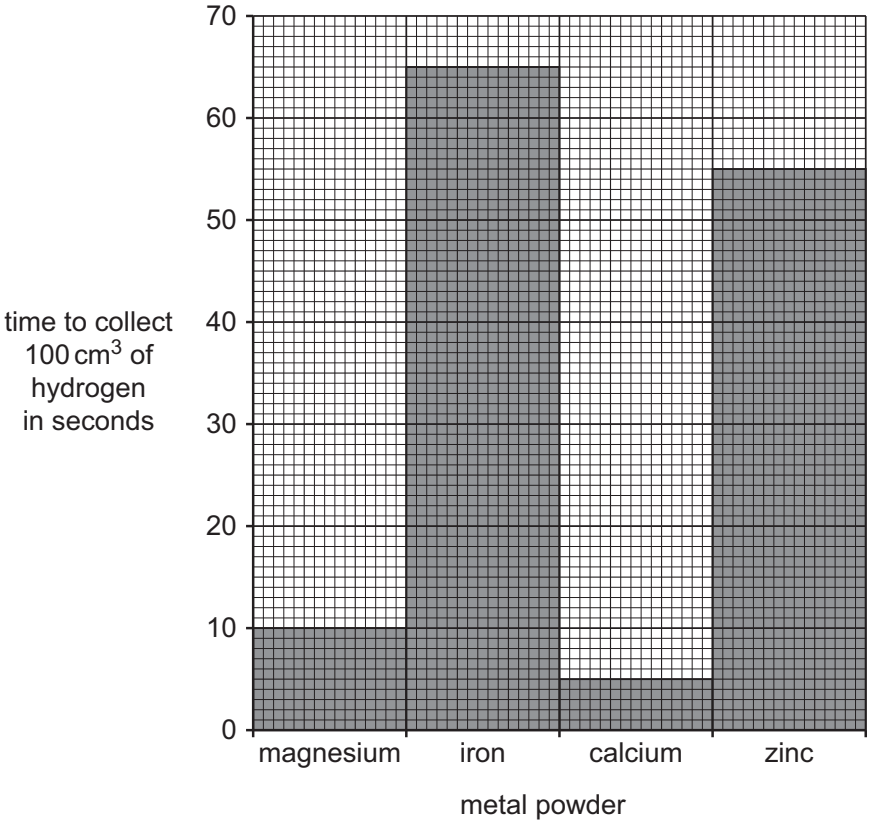
.....

2 .....

.....

[2]

(b) Look at his results.



(i) Look at the result for iron.

How many seconds does it take to collect 100 cm^3 of hydrogen?

.....seconds [1]

(ii) Which metal reacts the fastest with dilute hydrochloric acid?

..... [1]

(c) Zinc reacts with dilute hydrochloric acid.

Zinc chloride and hydrogen are made.

Write a **word** equation for this reaction.

..... [1]

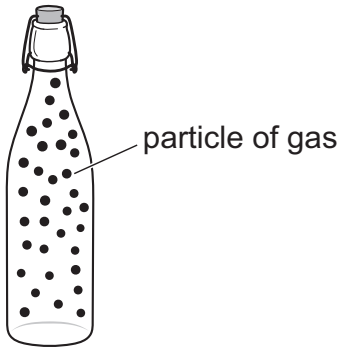
(d) Gold does **not** react with dilute hydrochloric acid.

Which word describes substances that are unreactive?

..... [1]

15 Look at the diagram.

It shows a sealed bottle containing particles of gas.



(a) The gas exerts a pressure on the sides of the bottle.

Explain how the gas exerts a pressure.

Use ideas about particles.

.....

..... [1]

(b) The sealed bottle is moved into a colder room.

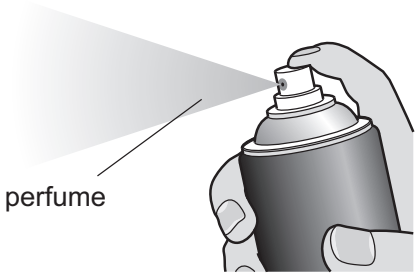
Explain why the pressure inside the bottle **gets less**.

Use ideas about particles.

.....

..... [1]

(c) A perfume is sprayed in a room.



The smell of the perfume eventually fills the room.

Circle the name of this process.

condensation **convection** **diffusion** **heating** [1]