

Particle model and pressure – GCSE Physics Paper 1

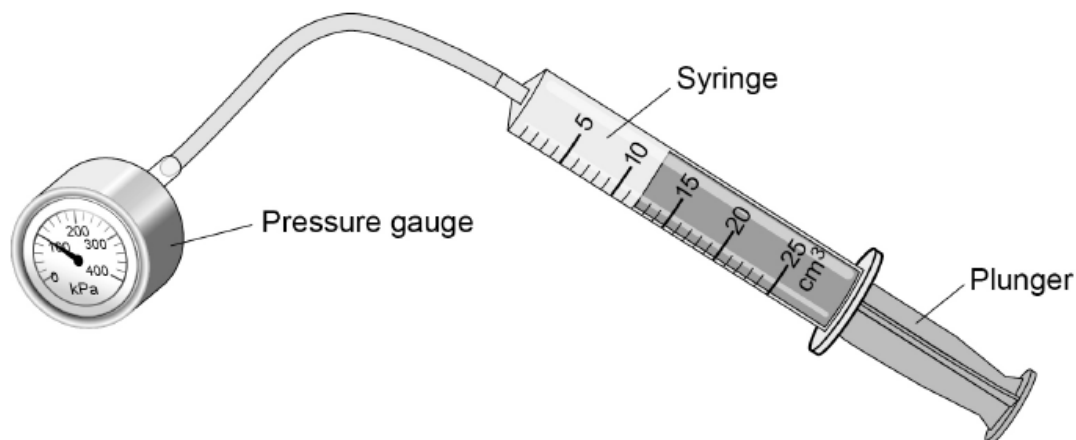
1. No.8

0 8

A teacher demonstrated the relationship between the pressure in a gas and the volume of the gas.

Figure 12 shows the equipment used.

Figure 12



0 8 . 1

What is the range of the syringe?

[1 mark]

Tick (✓) **one** box.

From 0 to 1 cm³

☐

From 0 to 5 cm³

☐

From 0 to 25 cm³

☐

0 8 . 2

The relationship between the pressure and volume of a gas is given by the equation:

$$\text{pressure} \times \text{volume} = \text{constant}$$

Complete the sentence.

[1 mark]

For this equation to apply, both the mass of gas and the _____
of the gas must stay the same.

0	8	.	3
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The initial volume of the gas in the syringe was 12 cm^3 .

The initial pressure of the gas in the syringe was $101\,000 \text{ Pa}$.

Calculate the constant in the equation below.

$$\text{pressure} \times \text{volume} = \text{constant}$$

[2 marks]

$$\text{Constant} = \text{_____} \text{ Pa cm}^3$$

0	8	.	4
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The teacher pulled the plunger slowly outwards and the gas expanded.

The new volume of the gas was 24 cm^3 .

Calculate the new pressure in the gas.

The constant has the same value as in Question 08.3

[3 marks]

$$\text{New pressure} = \text{_____} \text{ Pa}$$

08.5

Which change occurs when the plunger is pulled slowly outwards?

[1 mark]

Tick (✓) **one** box.

The gas particles stop moving.

☐

There are more frequent collisions between the gas particles.

☐

There is more space between the gas particles.

☐

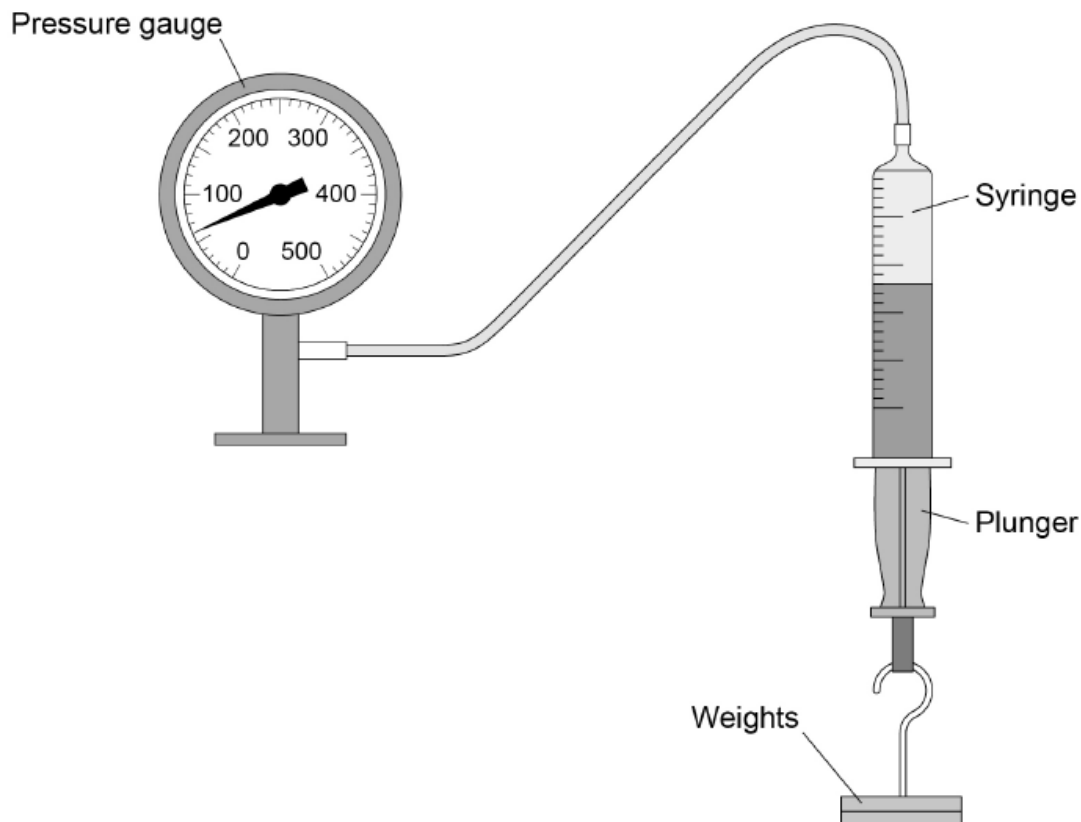
2. No.9

0 9

A teacher demonstrated the relationship between the pressure in a gas and the volume of the gas.

Figure 12 shows the equipment used.

Figure 12



This is the method used.

1. Record the initial volume of gas in the syringe and the pressure reading before any weights are attached.
2. Attach a 2.0 N weight to the syringe.
3. Record the volume of the gas and the reading on the pressure gauge.
4. Repeat steps 2 and 3 until a weight of 12.0 N is attached to the syringe.

09.1

What was the range of force used?

[1 mark]

From _____ N to _____ N

09.2

Give **one** control variable in the investigation.

[1 mark]

09.3

When the volume of gas in the syringe was 45 cm^3 , the pressure gauge showed a value of 60 kPa .

Calculate the pressure in the gas when the volume of gas in the syringe was 40 cm^3 .

[4 marks]

Pressure = _____ kPa

09.4

When the volume of gas in the syringe increased, the pressure on the inside walls of the syringe decreased.

Explain why.

[3 marks]
