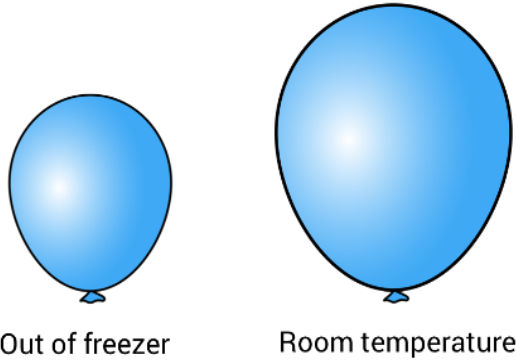


0	1
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Nadia is investigating how the pressure of a gas is affected by its temperature. She places a balloon into a freezer for one hour.

When she took it out of the freezer, she noticed that its volume had decreased. She then set it on a table. After a few minutes, it had returned to its original size, as shown below.



0	1
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 . 

1
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Describe the arrangement and motion of the particles in a gas.

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[2 marks]

0	1
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 . 

2
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Using ideas about particles and pressure, explain why the volume of the balloon had decreased when it was taken out of the freezer.

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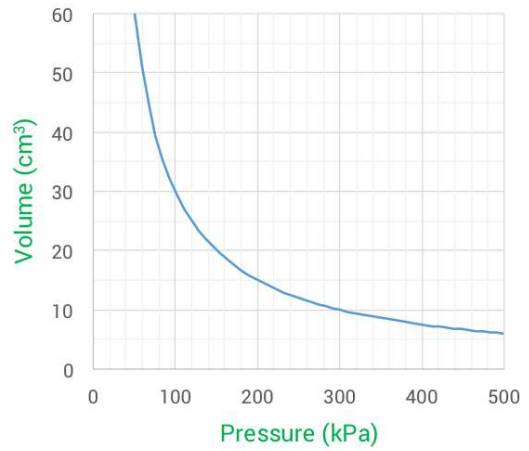
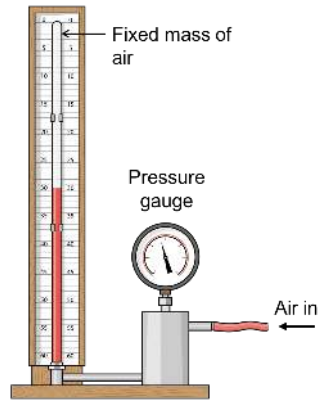
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[4 marks]

0 2

A teacher uses a foot pump to increase the pressure applied to a fixed mass of air. The experimental setup used, and the data obtained, are shown below.



0 2 . 1

State the independent variable in their investigation.

[1 mark]

0 2 . 2

Use the above experimental data to prove the following relationship for this fixed mass of air:

$$p V = \text{constant}$$

[2 marks]

0 2 . 3

Estimate what the volume of air would have been had the pressure been increased to 600 kPa.

[3 marks]