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# Solid Liquid and Gasses

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Problems by Topic

**Edexcel International GCSE**

10 Compressed air from a can is used to clean computer keyboards.



(a) Use ideas about particles to explain how a gas causes a pressure on the inside of a container. (3)

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(b) The can has a warning sign on it.

**WARNING**  
Pressurised container  
Do not expose to temperatures  
above 50 °C

(i) How would increasing the temperature of the compressed air affect the pressure in the can?

(1)

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(ii) Explain your answer.

(2)

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(c) The can has a volume of  $400 \text{ cm}^3$  and the pressure of the compressed air inside is 5 times atmospheric pressure.

Calculate the volume that the air would occupy if it were all released to atmospheric pressure.

(2)

Volume = .....  $\text{cm}^3$

January 2013

13 (a) A diver breathes air from a cylinder when he is under water.



(i) The cylinder contains 8 litres of air at 200 times atmospheric pressure.

The air is released from the cylinder at normal atmospheric pressure.

The diver needs 16 litres of air per minute.

Calculate the maximum amount of time that the diver can breathe under water using this cylinder.

(3)

time = ..... minutes

(ii) When the diver breathes out, bubbles are released.

Suggest why the bubbles expand as they rise to the surface.

(2)

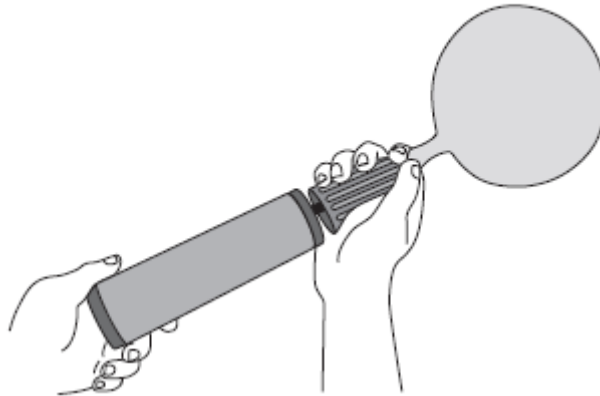
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(b) A student wants to investigate how the volume of a balloon changes with pressure.



(i) Suggest how the student could measure the volume of an inflated balloon.

(2)

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(ii) The student plans to measure the pressure of the air in the balloon.

To measure the pressure in the balloon I will count how many times I push the pump. The same amount of air goes into the balloon with each push.

When there is twice as much air in the balloon the pressure will be twice as high, so the pressure will be proportional to the number of times I push the pump.

Explain why the student's plan will not work.

(2)

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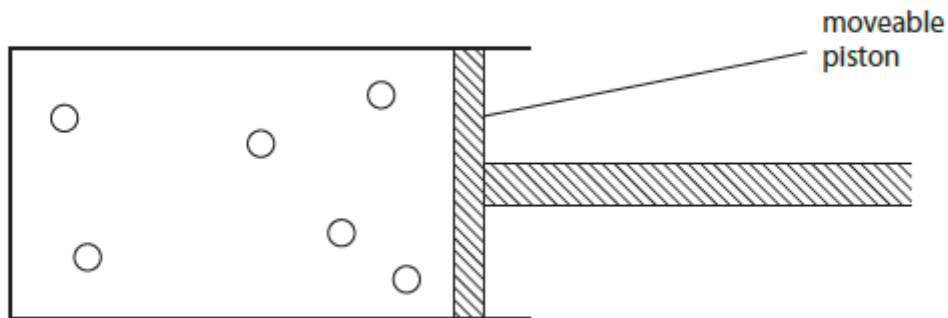
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(Total for Question 13 = 9 marks)

January 2014

3 The diagram shows some gas particles in a container.

The piston can be moved in or out to change the volume of the gas.



(a) Add arrows to the diagram to show the random motion of the gas particles.

(2)

(b) Explain how the motion of the gas particles produces a pressure inside the container.

(3)

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(c) State what would happen to the pressure if you pushed the piston into the container without changing the temperature.

(1)

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(d) When the gas in the container is heated, the piston moves outwards.

Place ticks (✓) against the **three** correct statements.

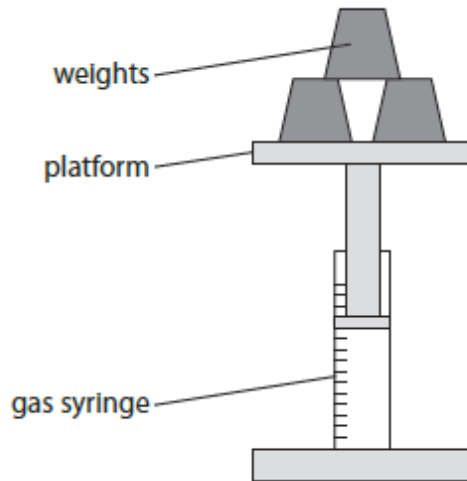
(3)

Statement	Tick (✓)
the gas particles get bigger	
the mass of the gas particles stays the same	
the gas particles move faster	
the average distance between the gas particles increases	
the temperature of the gas decreases	

(Total for Question 3 = 9 marks)

January 2015

12 A student uses this apparatus to investigate the pressure and volume inside a sealed gas syringe.



She takes readings of the volume as she increases the pressure (loading) and as she decreases the pressure (unloading).

These are her results.

Pressure in kPa	Volume of gas in cm <sup>3</sup>		
	loading	unloading	average (mean)
100	50	50	50
90	56	55	55.5
84	60	60	60
55	90		92
60	85	83	84
50	101	101	101



(a) (i) Complete the table by filling in the missing value.

(1)

(ii) Suggest why the student takes readings for increasing the pressure and for decreasing the pressure.

(2)

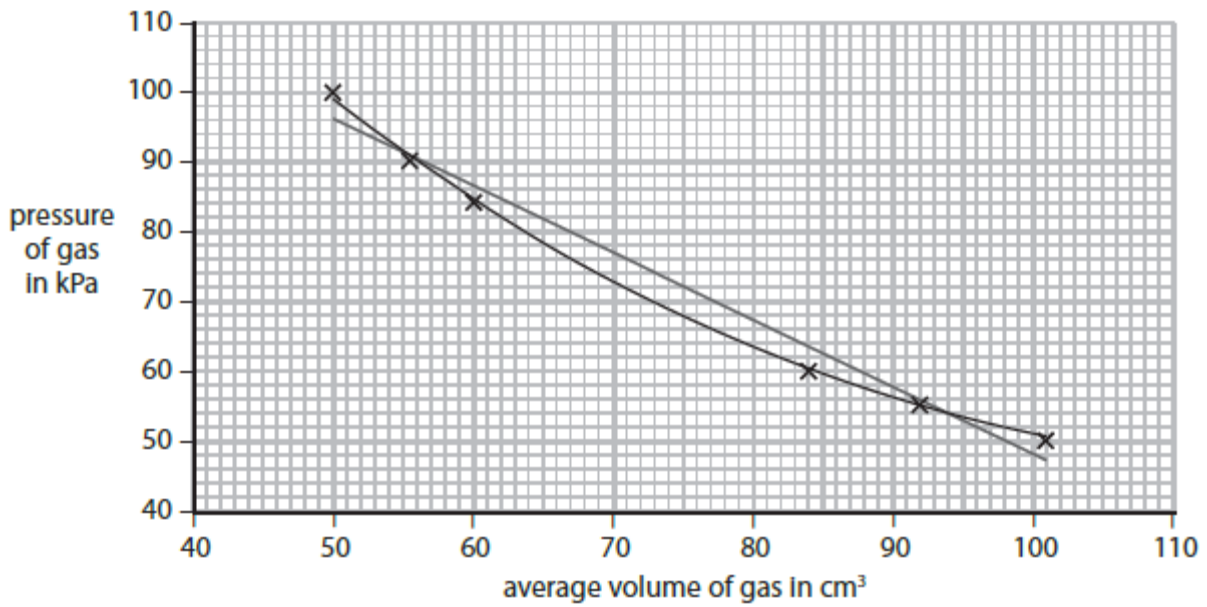
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(b) The student plots this graph.



(i) Suggest a reason why the axes do not start from the origin (0,0).

(1)

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(ii) The student has drawn both a straight line of best fit and a curve of best fit.  
Discuss which line is correct for this investigation.

(2)

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(iii) Suggest a way that the student could make this experiment valid  
(a fair test).

(1)

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(iv) Suggest two ways in which the student could improve the quality of her data.

(2)

1. \_\_\_\_\_

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2. \_\_\_\_\_

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- (c) The student concludes that her data validates the relationship between pressure and volume of a fixed mass of gas.

Use data from this table to evaluate her conclusion.

(3)

Pressure in kPa	Average volume in cm <sup>3</sup>	Space for calculations
100	50	
90	55.5	
84	60	
55	92	
60	84	
50	101	

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(Total for Question 12 = 12 marks)

January 2016