Particle model of matter

Physics Paper 1 | 5 questions, 6 marks each

GCSE science 6-mark questions

This topic online

Name: _____ **Date:** _____ **Score:** _____ **/ 30**

Plan before you write: jot down the 6 or more ideas you need, then put them in a sensible order. For compare questions give both sides of each point; for evaluate questions use the information and finish with a conclusion.

1 Haruto takes a tray of ice cubes at -10 °C out of the freezer and heats them steadily in a beaker. He records the temperature every minute. The temperature rises to 0 °C, then stays at 0 °C for several minutes while the ice melts, then rises again.

Explain these observations in terms of particles and internal energy. (6 marks)

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2 A bottle of olive oil is stored in a cold garage, where the oil turns solid. Later it is warmed until it is a liquid, and a few drops are heated in a pan until they become a vapour.

Compare the oil as a solid, a liquid and a gas. Refer to the arrangement and movement of the particles, the forces between them, and the density.

(6 marks)

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3 Zainab places crushed ice in a funnel with an electric heater pushed into it. A joulemeter records the energy supplied by the heater. She collects and weighs the water that melts. She repeats the test three times.

Trial	Energy supplied in J	Mass of ice melted in kg
1	18,000	0.050
2	27,000	0.075
3	36,500	0.100

The accepted value for the specific latent heat of fusion of ice is 334,000 J/kg.

Use the data to calculate a value for the specific latent heat of fusion of ice. Compare it with the accepted value and suggest reasons for the difference.

(6 marks)

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4 Callum seals some air inside a large syringe attached to a pressure gauge. He pushes the plunger in slowly, waiting each time before taking a reading, so the temperature stays the same.

Volume in cm^3	**60**	**50**	**40**	**30**	**25**	**20**
Pressure in kPa	100	120	150	200	230	300

Callum says: *My results show that the pressure of a gas is inversely proportional to its volume.*

Evaluate Callum's claim. Use the data and the particle model in your answer.

Separate science only

(6 marks)

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5 **Higher tier | Separate science only**

Leah pumps up her bike tyre quickly with a hand pump. After a minute of pumping she notices that the end of the pump near the valve feels warm. When she pumps the same tyre slowly, the pump warms up much less.

Suggest why the pump gets warm and why the speed of pumping makes a difference. Use ideas about work, internal energy and particles.

(6 marks)

End of questions | Total 30 marks

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