

CLASS 9

SCIENCE

EXTRA QUESTIONS

## Extra Questions: Class 9 Science Chapter 1 Matter in Our Surroundings (Legacy Chapter, Old Syllabus)

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Genuinely harder, HOTS-level practice for Class 9 Science Chapter 1 (Matter in Our Surroundings), going beyond the standard exercise.

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**Q1 (Applied reasoning).** Two identical cups of tea are poured at the same time and same temperature. One is placed in a fan's breeze, the other in still air. Which cools faster, and why, in terms of particle behaviour?

*Solution:* The one in the breeze cools faster. Moving air continuously sweeps away the layer of water-vapour-saturated air just above the tea's surface, keeping the surrounding air relatively dry and able to accept more evaporating particles — sustaining a higher evaporation rate, and hence a higher cooling rate, than still air where vapour quickly saturates the air right above the surface and slows further evaporation.

**Q2 (Assertion-Reason).** Assertion (A): CNG (compressed natural gas) can be stored as a liquid-like dense substance in a cylinder despite being a gas at room conditions. Reason (R): Applying very high pressure forces gas particles close enough together for intermolecular attraction to dominate.

*Solution:* Both A and R are true, and R correctly explains A — high pressure reduces the space between gas particles until attractive forces can hold them in a much denser, liquid-like state, which is exactly how CNG is stored compactly in cylinders. **Answer: Both true, R is the correct explanation of A.**

**Q3 (Graph-based).** A graph plots the temperature of a solid being heated steadily against time. The temperature rises, then stays flat for a while, then rises again. What does the flat portion represent, and what determines how long it lasts?

*Solution:* The flat portion is the melting point plateau, where the solid is changing to liquid; all the heat supplied during this stretch goes into breaking intermolecular bonds (latent heat of fusion) rather than raising temperature. Its duration depends on the mass of the substance and its specific latent heat of fusion — more mass or a higher latent heat means a longer flat stretch for the same rate of heat supply.

**Q4 (Real-world application).** Explain, using the concept of evaporation, why spilled petrol disappears from the ground quickly on a hot day but a spilled glass of water takes much longer.

*Solution:* Petrol is far more volatile than water — its particles are held together by much weaker intermolecular forces, so at the same temperature a much larger fraction of its particles have enough kinetic energy to escape into the gas phase. This gives petrol a much higher rate of evaporation than water, so it disappears from the ground far more quickly.