

CLASS 8

SCIENCE

EXTRA QUESTIONS

Extra Questions: Class 8 Science Chapter 7 Particulate Nature of Matter

Practice questions beyond the textbook exercise, testing deeper understanding of particle theory and states of matter for Class 8 Science Chapter 7: Particulate Nature of Matter.

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1 (Assertion-Reason). Assertion: Grinding chalk into fine powder is a chemical change. Reason: A chemical change always produces a new substance.

Solution: The assertion is **false** — grinding only breaks the chalk into smaller pieces of the same substance, a physical change. The reason is a true general statement on its own, but it doesn't apply here since no new substance is formed.

2 (Applied). A solid ice cube is heated until it becomes water vapour. Rank the three states by how closely their particles are packed, from closest to most spread out.

Solution: **Solid (ice) > liquid (water) > gas (vapour)** — particles are most tightly packed in the solid and most widely spread and randomly moving in the gas.

3 (Short Answer). Why can you smell perfume from across a room within a minute, even though each air molecule moves in a random direction rather than straight toward your nose?

Solution: Gas particles move extremely fast and collide constantly; even though each individual particle's path is random, this constant random motion (diffusion) still spreads the perfume particles to every part of the room fairly quickly.

4 (Synthesis). A student says, "Sugar disappears when dissolved in water, so it must have turned into a liquid." Explain why this reasoning is incorrect.

Solution: Sugar doesn't disappear or change state — it breaks into particles small enough to fit into the spaces between water molecules, remaining chemically the same substance (still tastes like sugar). This is dissolving, a physical process, not a change of state.

5 (Assertion-Reason). Assertion: Rice flour should be classified as a liquid because it flows and takes the shape of its container. Reason: Only liquids can flow and take the shape of a container.

Solution: Both the assertion and the reason are **false**. Rice flour is a solid — each tiny particle keeps its own fixed shape and volume; the "flowing" appearance comes from many separate solid particles sliding past each other, not from the substance itself being a liquid.

6 (Applied). Two identical closed boxes are filled — one with a gas, one with a liquid of the same mass. If both boxes are tilted, whose contents change shape more easily, and why?

Solution: The **gas** — its particles have the weakest interparticle attraction and move freely throughout the whole container, while a liquid's particles, though mobile, stay close together due to stronger attraction, so it changes shape more slowly and only along its exposed surface.

7 (Applied). Camphor disappears from an open dish over time without leaving a puddle of liquid. Name this process and give one other everyday example.

Solution: This is **sublimation** — a solid changing directly into a gas without passing through the liquid state. Another example: dry ice (solid carbon dioxide) turning directly into carbon dioxide gas.

8 (Short Answer). Why does a gas exert pressure on the walls of any container, while a solid placed in a box does not "press" on the walls the same way?

Solution: Gas particles move rapidly and randomly in all directions, constantly colliding with and pushing on the container's walls. Solid particles only vibrate in fixed positions and never travel to strike the walls the way gas particles do.

9 (Synthesis). Explain, using particle theory, why solids are very difficult to compress but gases are easy to compress.

Solution: In solids, particles are already packed closely together with almost no empty space between them, leaving little room to push them closer. In gases, particles are far apart with large empty spaces between them, and those spaces can be significantly reduced when compressed.

10 (Assertion-Reason). Assertion: Melting and dissolving are the same process. Reason: Both make a solid seem to disappear into a liquid.

Solution: Both the assertion and reason are **false**. Melting is a change of state, where a pure substance turns into its own liquid form purely from heat (e.g. ice into water). Dissolving is one substance's particles spreading through a different liquid to form a solution (e.g. sugar in water) — the sugar remains solid sugar particles dispersed in the water, not “liquid sugar.”