

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## What Dictates a Substance's Behavior? 7th Grade Particle Dynamics Quiz

Learners analyze kinetic energy and molecular attraction to predict how matter transforms, making this an ideal formative assessment for NGSS standards.

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**1. A scientist observes a substance where the particles exhibit 'ordered vibrations' but do not move from their fixed positions. What would happen if thermal energy is added to this system?**

- A. The particles will slow down and form a crystalline lattice.
- B. The kinetic energy will increase until attractive forces are partially overcome.
- C. The substance will immediately undergo deposition into a gas.
- D. The particles will lose their charge and become plasma.

**2. In a laboratory setting, \_\_\_\_\_ is the phase change that occurs when a gas loses enough thermal energy to become a liquid, such as when water vapor touches a cold mirror.**

- A. Sublimation
- B. Evaporation
- C. Condensation
- D. Vaporization

**3. True or False: The temperature of a substance remains constant during the actual process of a phase change, even if heat is still being added.**

- A. True
- B. False

**4. Why does a gas expand to fill the entire volume of any container it is placed in, regardless of the container's shape?**

- A. Gas particles have high kinetic energy and negligible attractive forces.
- B. Gases are composed of large atoms that push each other apart.
- C. The atmospheric pressure pulls the gas particles toward the walls.
- D. Gravity has no effect on matter in the gaseous state.

**5. Molten lava flowing down a volcano is an example of matter in the \_\_\_\_\_ state, characterized by having a definite volume but no fixed shape.**

- A. Solid
- B. Liquid
- C. Gas
- D. Plasma

**6. True or False: Liquid nitrogen turning into a visible 'cloud' at room temperature is an example of deposition.**

- A. True

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B. False

**7. Which of the following scenarios best demonstrates the concept of sublimation?**

- A. A puddle of water disappearing on a sunny afternoon.
- B. Atmospheric sulfur vapor forming crystals on a volcanic vent.
- C. Solid air fresheners shrinking over time without leaving a liquid residue.
- D. Applying heat to lead until it becomes a liquid.

**8. Standard pressure and temperature affect how matter behaves. If you were to climb a high mountain where air pressure is lower, the \_\_\_\_\_ of water would occur at a lower temperature.**

- A. Freezing
- B. Boiling
- C. Melting
- D. Condensing

**9. What distinguishes the movement of particles in a solid like quartz from the particles in a liquid like honey?**

- A. Quartz particles have no movement at all, while honey particles do.
- B. Honey particles can slide past each other, while quartz particles only vibrate.
- C. Quartz particles move faster than honey particles at room temperature.
- D. Honey particles are more tightly packed than quartz particles.

**10. True or False: Freezing is an endothermic process because you must 'add' cold to the substance.**

- A. True
- B. False