**Name:** _____ **Date:** _____

## Blast Through the Phase Change Barrier: 6th Grade Chemistry Challenge

Synthesize molecular behavior and kinetic energy concepts through a diverse question set designed to bridge the gap between macroscopic observations and microscopic particle motion.

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**1. A scientist observes a substance in a sealed chamber. As the pressure is rapidly decreased without changing the temperature, the substance transitions directly from a solid to a gas. Which phenomenon is being modeled?**

A. Evaporation
B. Sublimation
C. Deposition
D. Condensation

**2. In a closed system, when a gas loses kinetic energy and the attractive forces between particles begin to pull them into a fixed volume with a fluid shape, the process is called _____.**

A. Freezing
B. Vaporization
C. Condensation
D. Ionization

**3. During a phase change, such as water boiling at 100°C, the temperature of the substance continues to rise even as it absorbs more thermal energy.**

A. True
B. False

**4. Which of the following scenarios best demonstrates the concept of 'Diffusion' in a gaseous state?**

A. A balloon shrinking in a cold freezer
B. The scent of an orange being peeled spreading across a room
C. Water droplets forming on the outside of a cold soda can
D. Steam rising from a pot of simmering soup

**5. The state of matter characterized by particles that vibrate in a fixed position within a crystalline lattice is known as a _____.**

A. Amorphous Liquid
B. Plasma
C. Compressed Gas
D. Solid

**6. In a liquid, the particles have enough kinetic energy to slide past one another, which allows the substance to flow while maintaining a constant volume.**

A. True

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B. False

**7. On a molecular level, what happens during the process of Deposition?**

A. Gas particles rapidly lose energy and lock into a rigid structure.
B. Liquid particles gain enough energy to escape the surface.
C. Solid particles speed up and begin to slide past each other.
D. Gas particles collide to form liquid droplets.

**8. Compared to a liquid, the particles in a gas have _____ attractive forces between them, allowing them to fill any container regardless of size.**

A. Stronger
B. Infinite
C. Negligible
D. Static

**9. Viscosity is a property used to describe the resistance of a gas to flow through a constricted space.**

A. True
B. False

**10. You place a balloon over a beaker of boiling water. The balloon expands. Why does this happen based on the Kinetic Molecular Theory?**

A. The air inside the balloon is turning into a solid.
B. Thermal energy increases the speed of gas particles, causing more frequent and forceful collisions.
C. The mass of the gas particles increases as they get hotter.
D. Liquid water flows upward into the balloon, increasing the volume.