Name: _____ **Date:** _____

Answer Key: Rigid Structures Meets Wild Vibes: 9th Grade Matter Quiz

Perfect for a quick bell-ringer on molecular behavior and kinetic energy transitions from the kitchen to the cosmos.

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1. A block of solid gold is moved from a small jewelry box to a large safe. Which statement best describes the gold's behavior?

Answer: B) It maintains its fixed shape and fixed volume.

Solids have a definite shape and volume because their particles are closely packed and held in a fixed arrangement by strong intermolecular forces.

2. When you smell fresh cinnamon rolls across the house, the scent particles are behaving as a _____, spreading out to fill the entire space.

Answer: C) Gas

Gases have no definite shape or volume; they expand to fill whatever container (or room) they are in through a process called diffusion.

3. In a liquid state, such as molten lava, the particles have enough energy to slide past one another while still remaining in contact.

Answer: A) True

Liquids are fluid because their particles have enough kinetic energy to overcome some attractive forces and flow, though they stay close together.

4. On a very cold morning, you notice 'frost' patterns on a car windshield that formed directly from water vapor in the air. This process is called:

Answer: D) Deposition

Deposition is the phase change where a gas turns directly into a solid without first becoming a liquid.

5. The phase change where a solid like mothballs or solid air freshener turns directly into a gas is known as _____.

Answer: A) Sublimation

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Sublimation occurs when the surface particles of a solid gain enough energy to break away directly into the gas phase.

6. Increasing the temperature of a substance generally decreases the kinetic energy of its particles.

Answer: B) False

Temperature is a measure of average kinetic energy; as temperature increases, particles move faster and have more kinetic energy.

7. Which of the following describes the behavior of particles in a sample of nitrogen gas inside a sealed canister?

Answer: C) They move rapidly and randomly in all directions.

Gas particles have high kinetic energy and weak attractive forces, allowing them to move independently at high speeds.

8. If you pour 50mL of olive oil from a tall thin graduated cylinder into a wide flat bowl, the _____ of the oil remains at 50mL.

Answer: C) Volume

Liquids have a definite volume despite being able to change their shape to match their container.

9. Condensation is a cooling process where a gas loses energy and turns into a liquid.

Answer: A) True

Condensation occurs when gas particles cool down, lose kinetic energy, and the attractive forces pull them back into a liquid state.

10. Which substance is an example of an 'amorphous' solid, meaning its particles are NOT arranged in a repeating geometric pattern?

Answer: B) Glass

Unlike crystalline solids like salt or quartz, glass has a disordered particle arrangement, making it an amorphous solid.