Grade 9 Unit 2 Quiz: Matter and Change

Particles, properties, mixtures, and conservation

Name: _____ Date: _____

Time: 25–30 minutes. **Tools:** calculator permitted. Use a particle-level explanation when asked; do not rely on color alone as evidence of a chemical change.

1. A sample changes shape to fit a cup but keeps nearly the same volume. Identify its state and give one particle-level reason. [2 pts]

2. During melting of a pure substance, temperature remains constant while heating continues. Where does the energy go? [1 pts]

3. A sealed syringe containing air is pushed from 40 mL to 20 mL at constant temperature. What changes and what stays the same about the particles? [2 pts]

4. Classify each as a physical or chemical property: density; flammability. [1 pts]

5. A metal block has mass 24.0 g and volume 8.0 mL. Calculate density. [2 pts]

6. A student crushes a solid tablet and it dissolves faster. Does faster dissolving by itself prove a chemical change? Explain. [2 pts]

7. Classify each sample: distilled water, air, and muddy water. Use the terms pure substance/mixture and homogeneous/heterogeneous when they apply. [2 pts]

8. Choose a separation method for iron filings, sand, and salt mixed with water. Give the order and the property used at each step. [3 pts]

9. A student filters clear saltwater and says, “The salt disappeared.” Correct the claim using a particle explanation and name one recovery method. [2 pts]

10. An open beaker and contents have a mass of 85.12 g before a bubbling change and 84.70 g after. Does this prove matter was destroyed? Explain with a system boundary. [2 pts]

11. A particle model shows 3 red and 6 blue atoms before a change, then 2 red and 6 blue atoms after. Identify the conservation problem and revise the model requirement. [1 pts]