Matter Unit Assessment Study Guide Answers

**A Proficient student can recognize that all matter is made of atoms, and atoms of the same elements are all alike, but are different from the atoms of other elements.**

1. What is matter? Matter is anything that has mass and takes up space
2. What is an element? An element is a pure substance that can’t be broken down into any other substance – the simplest substance
3. What is an atom? An atom is the basic particle of an element
4. What is a molecule? A molecule is more than one atom combined
5. How are atoms alike? How are they different? Atoms are alike because they are all the smallest particle of their element. All copper atoms have the same properties. All gold atoms have the same properties. All hydrogen atoms have the same properties. Atoms are different because the atoms of each element are different and have different properties. So copper atoms have different properties than gold atoms do. And copper and gold atoms both have different properties than hydrogen atoms do.
6. How are atoms and elements related? An atom is the smallest part of an element that still has the same properties as the element does
7. What is a compound? What happens to their properties when substances are chemically combined? A compound is a pure substance made of 2 or more chemically combined elements. When substances are chemically combined, they form compounds that have different properties than the uncombined elements
8. Do all atoms have the same properties? All atoms of the same element have the same properties, but atoms of different elements have different properties
9. What is the periodic table? The periodic table is an organized chart of all the elements we have found so far.

**A proficient student can compare the physical properties of pure substances.**

1. What is the difference between a physical property and a chemical property? A physical property is a characteristic of a pure substance that can be observed without changing it into another substance. A chemical property is a characteristic of a pure substance that describes its ability to change into a different substance.
2. What is volume and how do we measure it? Volume is the amount of space something takes up. We measure it by using the formula LxWxH, or with a graduated cylinder or by displacement
3. What is mass and how do we measure it? Mass is the amount of matter in an object. We measure it using a triple beam balance.
4. What is weight and how do we measure it? Weight is a measure of the force of gravity on an object. We measure it using a scale.
5. How is mass different than weight? Mass will not change no matter where you measure it. Your weight will be different depending on the gravitational force where you are; for instance, you will weigh less on the moon than on Earth
6. What is density and how do we calculate it? Density is amount of mass per unit volume. We calculate it by the equation: density = M/V or mass divided by volume
7. What are the three most common states of matter on Earth? Describe them in terms of shape, volume, particle arrangement and particle movement. The three most common states of matter on Earth are solid, liquid and gas. Solids have a fixed shape and a fixed volume. The particles in a solid are packed tightly together and vibrate. Liquids have no fixed shape (they take the shape of their containers) but they do have a fixed volume. The particles in a liquid are close together, but not as close together as in a solid. The move faster than the particles of a solid, and they slide past each other. Gases have no fixed shape and no fixed volume. The particles of a gas are spread far apart and move around very quickly.
8. What is vaporization? What is a boiling point? Vaporization is when a liquid changes to a gas. A boiling point is the temperature at which a liquid changes to a gas.
9. What is melting? What is a melting point? Melting is when a solid changes to a liquid. A melting point is the temperature at which a solid changes to a liquid.
10. What is condensation? Condensation is when a gas changes to a liquid.
11. What is sublimation? Sublimation is when a solid changes directly to a gas, without changing to a liquid first.
12. What is freezing? What is a freezing point? Freezing is when a liquid changes to a solid. The freezing point is the temperature at which a liquid changes to a solid.
13. What is evaporation? Evaporation is when a liquid changes to a gas at the surface, without boiling (at a temperature below the boiling point)
14. What is deposition? Deposition is when a gas changes directly to a solid without changing to a liquid first.
15. Name the freezing, melting and boiling points of water in degrees Fahrenheit and in degrees Celsius. Freezing: 32 degrees F, 0 degrees C; Melting: 32 degrees F, 0 degrees C; Boiling: 212 degrees F, 100 degrees C
16. Which properties that we studied are affected by the amount of matter, and which are not affected by the amount of matter? Mass, Volume, Length and weight are affected by the amount of matter. Density, Boiling point, Freezing Point, Melting point, Solubility, Hardness, Texture, Temperature, Phase, Flammability, Oxidation, Color, Luster, Conduction, Magnetism, Malleability, Reactivity, Smell, and pH are not affected by the amount of matter.

**A proficient student understands the concept of solubility and the factors that affect it.**

1. What is solubility? Solubility is the amount of solute that can be dissolved in a specific volume of solvent, under certain conditions
2. What is a solution? A solution is a type of homogeneous mixture where 1 substance dissolves into another substance
3. What is a solvent? A solvent is the material that is doing the dissolving
4. What is a solute? A solute is the material that is being dissolved
5. What is a saturated solution? A saturated solution is when it is holding as much solute as it possible can, and if you add any more solute, it will start to come out of solution
6. What is a mixture? A mixture is a combination of two or more substances where each substance keeps its own properties, even though it is mixed with another substance.
7. What is a homogenous mixture? A homogeneous mixture is a mixture that is so evenly mixed that you cannot see the different parts.
8. What is a heterogeneous mixture? A heterogeneous mixture is a mixture that you can see the different parts.
9. What factors affect the speed that substances will go into solution? Some factors that affect the speed that substances go into solution include: The temperature of the solvent, the size of the solute’s particles, and stirring.
10. What factors affect how much solute will dissolve in a solvent? Some factors that affect how much solute will dissolve in a solvent include: the temperature of the solvent, the pressure of the container, and the type of solvent
11. How does the effect of the temperature of the solvent differ when the solute is a solid compared to when the solute is a gas? If you are dissolving a solid in a liquid, increasing the temperature of the liquid increases the solubility of the solid. If you are dissolving a gas in a liquid, increasing the temperature of the liquid decreases the solubility of the gas.
12. Why is water known as the universal solvent? Water is known as the universal solvent because it is the most common solvent, and it will dissolve so many solutes.