Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Homeroom:\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_ **4.4**

**The Law of Conservation of Mass (SPI.9.11)**

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| ***Key Point*** | ***Notes*** |
| **Mass** | •**Mass** is the amount of \_\_\_\_\_\_\_\_\_\_\_ in a substance  –We know that all matter is made up of atoms  **•Mass** isusually measured using a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **•**Mass is usually measured in \_\_\_\_\_\_\_\_ (g) or kilograms (kg) |
| **Chemical Equations** | We use \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_to show what happens in chemical reactions.  Ex: C3H8 + 5 O2 🡪 3 CO2 + 4 H20  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_🡪\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| **Law of Conservation of Mass** | •Antoine Lavoisier formulated the **Law of Conservation of Mass**  •**The law** states that **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**  •During a chemical reaction, new bonds are created or the bonds of the **reactants** are broken, and the atoms are **rearranged** to form \_\_\_\_\_\_\_ **substances**.  •Because **matter must be** \_\_\_\_\_\_\_\_\_\_\_\_\_\_, the **total mass of the products will be exactly \_\_\_\_\_\_\_\_\_\_\_\_ to the total mass of the reactants**  In a chemical reaction, \_\_\_\_\_\_\_ are **NOT** created or destroyed.  •Also, because the atoms are not changed, the total mass of each \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the \_\_\_\_\_\_\_\_ in the products and \_\_\_\_\_\_\_\_\_\_\_\_\_\_  **The total \_\_\_\_\_\_\_\_\_ of substances does not change during a \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**  **The total mass of the reactants will always be *exactly equal* to the mass of the products!!!** |
| **Solving Problems using the Law of Conservation of Mass** | * Chemical equations are similar to algebraic equations in that the total number of atoms of each element must be equal on each side * Therefore, you can set chemical reactions up like \_\_\_\_\_\_\_\_\_\_ expressions. * The 🡪 (yield/produce sign) can be changed to an \_\_\_\_\_\_\_\_\_ sign.   Steps to Solving:   1. Find our reactants and products. 2. Look for what we are solving for. (This is your x) 3. Make an equation where the mass of the reactants \_\_\_\_\_\_\_\_ the mass of the products.   Mass of reactants = mass of products   1. Solve for x!!   *Guided Example #1:*  \_\_\_\_ grams reactant L + 2 grams reactant M → 8 grams product N    *Guided Example #2:* 40 g of calcium reacts with 71 g of chlorine to produce \_\_\_\_\_ g of calcium chloride. |
| **So What?!** |  |

**“We Own This” (Guided Practice):**

1. \_\_\_\_\_ g of potassium reacts with 16 g of oxygen to produce 94 g of potassium oxide.
2. 14 g of lithium reaction with \_\_\_\_\_ g sulfur to produce 46 g of lithium sulfide.
3. Methane gas consists of C and H. When the gas was burned, the only visible product was water vapor. Was C atom destroyed?
4. 1 grams reactant A + 10 grams reactant B → \_\_\_\_\_\_ grams product C
5. 3 grams reactant W + \_\_\_\_ grams reactant X → 2 grams product Y + 10 grams product Z

**“I Own This” (Independent Practice):**

1. 1 grams reactant X + 10 grams reactant Y → \_\_\_\_\_\_ grams product Z
2. 3 grams reactant E + \_\_\_\_ grams reactant F → 2 grams product G + 10 grams product H
3. \_\_\_\_ grams reactant U + 3 grams reactant V → 7 grams product W
4. 10 grams reactant Q + \_\_\_\_\_ grams reactant R → 20 grams product S + 20 grams product T
5. Burning 2 kilograms of wood leaves 1 kilogram of ash and \_\_\_\_ grams of carbon dioxide gas and gaseous water
6. Combining 4 grams of oxygen and 8 grams of iron to produce \_\_\_ grams of iron oxide

7. Fred mixed 12 grams of Hershey’s chocolate into a cup that had 35 grams of milk in it. He then put a lid on the cup and shook it until the chocolate was completely mixed with the milk. What is the mass of the chocolate milk?

8. A chemist mixed 23 grams of hydrofluoric acid with 17 grams of mossy zinc. The mossy zinc disintegrated in the hydrofluoric acid. This all happened in a sealed beaker. What was the mass of the products left in the beaker?