Laws of Conservation

Learning Goals: I will be able to …
- define the *Law of Conservation of Matter*
- define the *Law of Conservation of Mass*
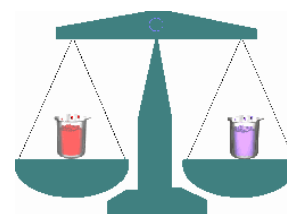- use the laws to determine the masses of reactants and products

Class Discussion:

Recall the Inquiry Activity: *Does the Mass Add Up?*

What was your conclusion?

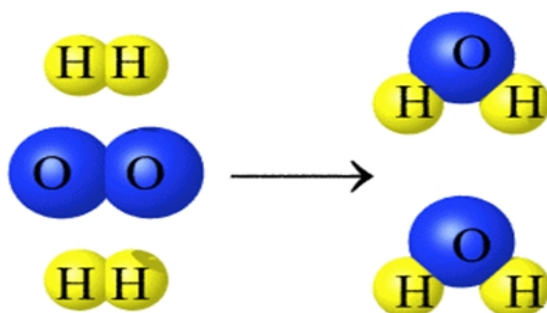So, is anything lost during a chemical reaction?

Answer: NO!

All chemical changes in a reaction obey the following two laws:

1. Law of Conservation of Matter

In a chemical reaction, matter is neither created nor destroyed.

Therefore, the same number of atoms present before the chemical reaction must be present after the chemical reaction is complete.
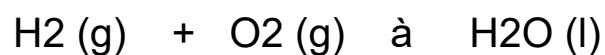
2. Law of Conservation of Mass

In a chemical reaction, the total mass of the reactants is always equal to the total mass of the products.

Example:

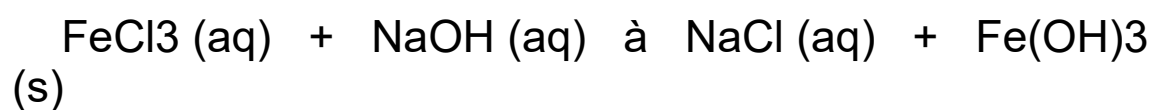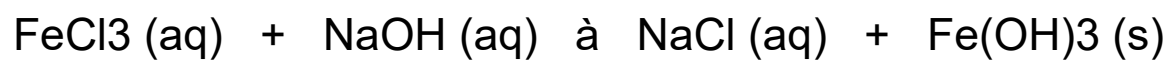If 5g of hydrogen reacts with oxygen and produces 13g of water, what was the mass of oxygen ?

H2 (g)   +   O2 (g)   à   H2O (l)

5g   **8g**   13g

Try Examples 1-3 on the worksheet

Let's look at the reaction from yesterday's example:

FeCl3 (aq) + NaOH (aq) à NaCl (aq) + Fe(OH)3 (s)

Does the chemical equation obey the *Law of Conservation of Matter?*

reactants	products

FeCl3 (aq) + NaOH (aq) à NaCl (aq) + Fe(OH)3 (s)

Does the chemical equation obey the *Law of Conservation of Mass?*

reactants	products

In order to obey the Law of Conservation of Matter and the Law of Conservation of Mass, chemical equations need to be BALANCED.

Balancing chemical equations involves placing ***coefficients*** in front of the chemical formulas.

　　Example:　　　　　NaSO4

2

coefficient

Before we can balance chemical equations, it is important to know how to count atoms:

Examples:

Na_2CO_3

$3K_2SO4$

$2Ca_3(PO_4)_2$