Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Homeroom: \_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_ **4.6**

**Counting the Number of Atoms & Recognizing Balanced Equations (SPI.9.11)**

|  |  |
| --- | --- |
| ***Key Point*** | ***Notes*** |
| **Chemical Reaction Code** | Screen shot 2010-10-24 at 2.01.28 PM.png |
| **Subscript** | * **A subscript** **is whole number (decreased in font) that comes** \_\_\_\_\_\_\_\_ a **chemical symbol.** * A subscript only corresponds to the \_\_\_\_\_\_\_\_\_\_\_ that it immediately follows * If there is not a subscript written, a subscript of \_\_\_\_\_ can be assumed * A subscript is used to tell the number of \_\_\_\_\_ in EACH \_\_\_\_\_\_\_\_\_\_\_\_ in a compound |
| **Coefficient** | * A **coefficient** is a whole number comes in \_\_\_\_\_\_\_\_\_ of the element or compound, never in the middle! * *You \_\_\_\_\_\_\_\_\_\_\_ the coefficient to \_\_\_\_ the numbers in the compound*   Ex: 3AlCl3  How many atoms of each element do you have? |
| **Following the Law of Conservation of Mass** | Chemical reactions **MUST follow the law of conservation of \_\_\_\_\_\_\_.**  What was that LCM again?   * The mass of the products will equal the mass of the reactants * There must be the same number of \_\_\_\_\_\_\_\_ at the beginning and \_\_\_\_\_\_\_ of chemical reaction. * If 3 carbons are in the \_\_\_\_\_\_\_\_\_\_\_ of a reaction, then there darn well better be 3 carbons in the products of a reaction. * No new atoms are \_\_\_\_\_\_\_\_ and none of the original atoms are destroyed. As a result, the mass of the reactants and the products is the \_\_\_\_\_\_. |
| **Balanced Equations** | * In order to follow this law, every chemical equation must be a **balanced** chemical equation. * Two things must be balance:   + \_\_\_\_\_\_   + \_\_\_\_\_\_\_\_ * The number of \_\_\_\_\_\_\_ of each element on the reactants side **must** \_\_\_\_\_\_\_\_\_ the number of atoms of each element on the products side! * We change \_\_\_\_\_\_\_\_\_\_\_ to balance equations! * With proper coefficients, the equation now adds up! This gives us a \_\_\_\_\_\_\_\_\_\_\_ equation. |
| **So What?!** |  |

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

1. Calculate the number of atoms of each element in the following:
2. 2HgO

|  |  |
| --- | --- |
| Element | # of atoms |
|  |  |
|  |  |

c. 2AlCl3

|  |  |
| --- | --- |
| Element | # of atoms |
|  |  |
|  |  |

d. 4H2O

|  |  |
| --- | --- |
| Element | # of atoms |
|  |  |
|  |  |

e. 6H2O

|  |  |
| --- | --- |
| Element | # of atoms |
|  |  |
|  |  |

f.5KCl

|  |  |
| --- | --- |
| Element | # of atoms |
|  |  |
|  |  |

2. Calculate the number of atoms for each element on each side of the equation and decide if the equation is balanced.

a. 2HgO 🡪 2Hg + O2

|  |  |  |
| --- | --- | --- |
| Element | # of Atoms on left | # of atoms on right |
| Hg |  |  |
| O |  |  |

Is the equation balanced?

b. Zn + HCl 🡪 ZnCl2 + H2

|  |  |  |
| --- | --- | --- |
| Element | # of Atoms on left | # of atoms on right |
|  |  |  |
|  |  |  |
|  |  |  |

Is the equation balanced?

c. Fe + O2🡪 Fe2O3

|  |  |  |
| --- | --- | --- |
| Element | # of Atoms on left | # of atoms on right |
| Fe |  |  |
| O |  |  |

Is the equation balanced?

**“Own It Even Further” (Early Finisher):**

Try to balance the equations above that were not balanced OR work on your Lab Report!