LESSON 72

ACTIVITY

Atom Inventory
Balancing Chemical Equations

Name _____

Date _____ Period _____

Purpose

To practice balancing chemical equations.

Procedure and Questions

1. **Unbalanced equation 1:** $Zn(s) + HCl(aq) \longrightarrow ZnCl_2(aq) + H_2(g)$

   a. Use the materials to build models of the reactants and products. Use a different color to represent each type of atom. Sketch your models here.

   b. Take an inventory of the atoms. Is the same number of atoms on both sides of the equation?

Inventory of Atoms	
Reactant side	**Product side**
___ Zn	___ Zn
___ H	___ H
___ Cl	___ Cl

   c. Add appropriate units of reactants and products to *balance* the equation. Each side should end up with the exact same number of atoms. Follow these guidelines: You can add single atoms of Zn, units of HCl, units of $ZnCl_2$, or units of H_2 to either side of the equation. Do *not* add single atoms of H or Cl.

   d. Take another inventory of the atoms. If the equation is not balanced, repeat the previous step until the same number of each type of atom is on both sides of the equation.

Inventory of Atoms	
Reactant side	**Product side**
___ Zn	___ Zn
___ H	___ H
___ Cl	___ Cl

   e. Write out the balanced chemical equation by indicating how many of each atom, molecule, or compound is needed. If only one atom or compound is needed, you do not need to write the number 1.

2. Use models to help you balance each equation.

   a. $\_\_O_2(g) + \_\_H_2(g) \longrightarrow \_\_H_2O(l)$

   b. $\_\_CH_4(g) + \_\_O_2(g) \longrightarrow \_\_CO_2(g) + \_\_H_2O(l)$

   c. $\_\_NO_2(g) + \_\_H_2O(l) \longrightarrow \_\_HNO_3(aq) + \_\_NO(g)$

3. **Making Sense** When is it okay to add individual atoms when balancing equations?