Warm-up
Spiral

Write or read over your summary for the notes on "Describing Chemical Reactions"
(Pgs. 544 – 548)

If you were absent, begin to write notes now and complete tonight for homework.

Review

Use your notes & write answers
to the following:

1. How is a subscript different from a coefficient?

2. How are reactants and products related?

3. How is a chemical equation different from
a chemical formula?

Review

1. How is a subscript different from a coefficient?

A subscript is lower and smaller and follows an element's symbol. It represents the number of atoms of that element in a molecule. (O_2)

A coefficient is the number in front of a chemical formula and it shows the number of molecules. (2 NaCl)

Review

1. How is a subscript different from a coefficient?

2. How are reactants and products related?

Reactants are the materials you start a reaction with and the products are the materials you end with.

Review

3. How is a chemical equation different from a chemical formula?

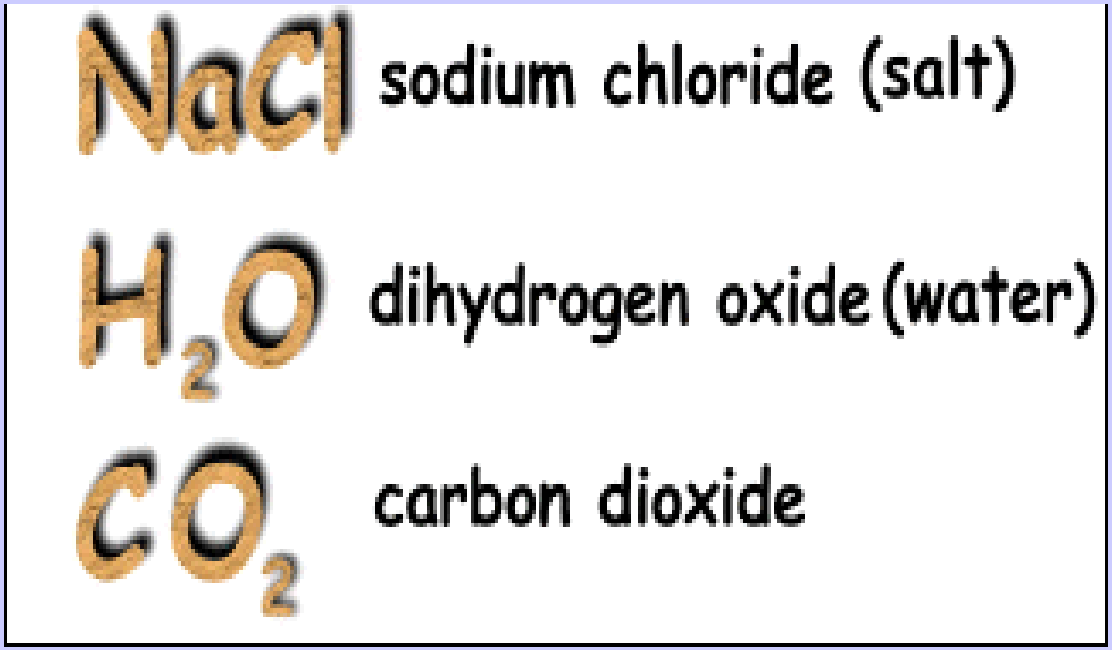
A chemical equation is a short, easy way to show a chemical reaction using symbols.

$Na + Cl \rightarrow NaCl$

A chemical formula is a combination of symbols that represent the elements in a compound.

NaCl

Chemical Formulas



Chemical formula

A "word" to represent a compound

coefficient

3 H_2O

subscript

Rules for reading chemical formulas

Rule 1

Symbol stands for 1 atom of that element

CaO 1 atom of calcium

1 atom of oxygen

Rule 2

Subscript shows more than 1 atom of that element.

Subscript tells how many atoms of that element.

$MgCl_2$ 1 atom magnesium
2 atoms chlorine

H_2CO_3 2 atoms hydrogen
1 atom carbon
3 atoms oxygen

Rule 3

If a symbol or group of symbols is surrounded by parentheses, MULTIPLY the number of each of the atoms inside the parentheses by the subscript

$Ca(NO_3)_2$ 1 atom of calcium
2 atoms of nitrogen
6 atoms of oxygen

Rule 4

Coefficient shows # of molecules.

No coefficient, only 1 molecule.

$3H_2O3$ molecules of water

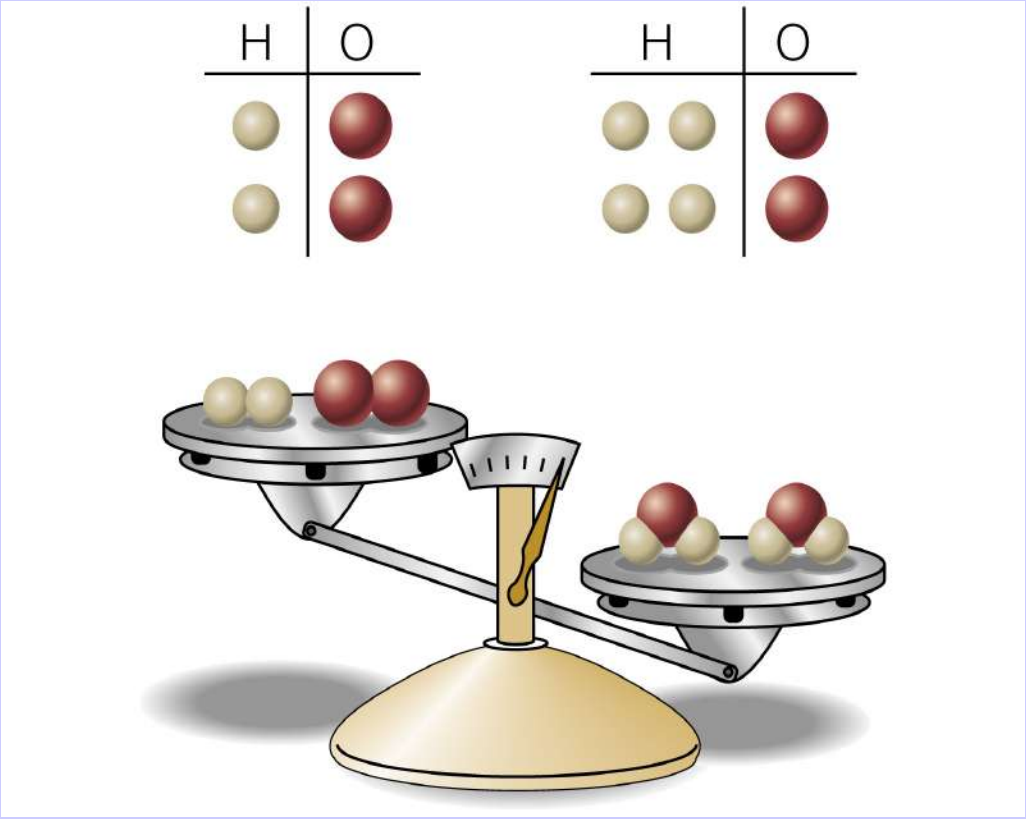
H_2O1 molecule of water

Make the following chart on the left hand page

Chemical Reactions

Formula	**# of Molecules**	**Total # of Atoms for each Element**
Example: 3 H_2O	3 molecules	H - 6 atoms O - 3 atoms
2 H_2SO_4	2 molecules	H - 4 atoms S - 2 atoms O - 8 atoms
	6	6 6
	1	1 2
	4	8 12
	2	2 6

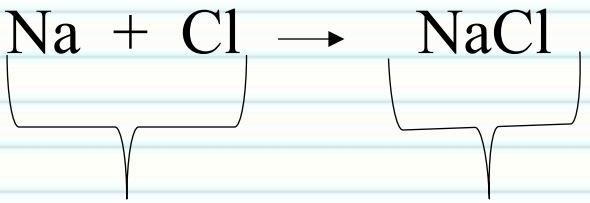
Balancing Chemical Equations



Molecule

Combination of 2 or more atoms

Chemical Equation



reactants
beginning materials

product
materials at the end of the reaction

Law of Conservation of Mass

Amount of matter in a chemical reaction does not change

Matter is not created or destroyed

1. Write the equation

$H_2 + Cl_2 \rightarrow HCl$

2. Count the number of atomsfor each element of the reactants and each element of the products

H = 2 Cl = 2 → H = 1 Cl = 1

3. Add coefficients only to balance

$H_2 + Cl_2 \rightarrow 2HCl$

Example #2

$H_2 + O_2 \rightarrow H_2O$

H = 2 O = 2 → H = 2 O = 1

Balanced Equation

$2\ H_2 + O_2 \rightarrow 2\ H_2O$

Additional Practice
Balancing Equations
on Overhead

Classifying Chemical Equations

1. Synthesis2 or more substances combine

$2SO_2 + O_2 + 2H_2O \rightarrow 2H_2SO_4$

(A + B + C → ABC)

2. Decompositionbreaking down compounds

$2H_2O_2 \rightarrow 2H_2O + O_2$

(AB → A + B)

3. Replacementsingle - 1 element replaces another in a compound

$2CuO + C \rightarrow 2Cu + CO_2$

(AB + C → A + BC)

double - 2 elements in different compounds trade places

$RbBr + AgCl \rightarrow AgBr + RbCl$

(AB + CD → CB + AD)

Controlling Chemical Reactions

(Pgs. 237 – 239)

What are the factors affecting rates of chemical reactions?

Surface area

Temperature

Concentration

Catalysts

Inhibitors