

Making Molecules

Name _____

Hour _____

Background Information: An element is a substance made up a single type of atom. There are 92 naturally occurring elements in the world; yet there are many, many more types of matter. Elements combine to form molecules.

Molecules have a specific number of atoms in a specific order. When atoms combine, the element atoms lose their individual chemical properties and form new properties. The molecule is the smallest unit that can exist alone and keep the properties of that material. Molecules can be made up of one or more elements.

Molecules are written using **formulas**. The chemical formula shows how many atoms of each element are in one molecule of the substance. Formulas are written by putting the element symbols next to each other. If there is more than one atom of an element in the molecule, the formula shows it by a small number after the symbol of the element. This number is called a **subscript**. No number after an element's symbol is understood to mean one atom of that element is present. For example, the formula for water is H_2O , which means there are 2 atoms of hydrogen and one atom of oxygen in the molecule. Obviously, water has totally different properties than hydrogen gas or oxygen gas.

To show the number of molecules, a number is put in front of the molecule. This number is called a coefficient. For example 4 molecules of carbon dioxide are written as $4CO_2$. This means there are a total of 4 Carbon atoms and 8 Oxygen atoms in the molecule. Think about what you do in your math class and when you multiply $4 \times (CO_2)$.

Practice:

Use your Periodic Table to complete the table below.

Name	Hydrogen	Oxygen					Magnesium
Symbol			Na	S		Cl	
Atomic #					6		
Atomic Mass							
# Protons							
# Electrons							
Families						7A	
Period							

Procedure:

Pick one color to represent each of the elements below. Color each circle with colored pencils.

Hydrogen ○ (H)

Oxygen ○ (O)

Sodium ○ (Na)

Sulfur ○ (S)

Carbon ○ (C)

Chlorine ○ (Cl)

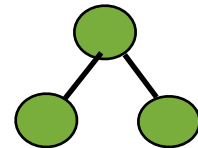
Magnesium ○ (Mg)

Use this information:

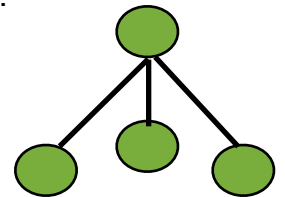
*Molecules with two atoms are linear:



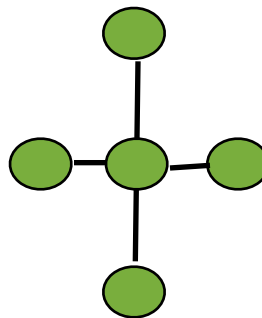
*Molecules with three atoms on either side of a center atom are bent:



*Molecules with four atoms around a center atom are shaped like pyramids:



*Molecules with five atoms make a cross:



Use the information from the previous page to help you fill in the table below.

Molecule	Formula	Number of atom of each element	Drawing using your colors chosen
Sodium chloride (table salt)	NaCl		
Chlorine gas	Cl ₂		
Ozone	O ₃		
Hydrochloric acid	HCl		
Carbon dioxide	CO ₂		
Sulfur dioxide	SO ₂		
Oxygen	O ₂		
Magnesium chloride	MgCl ₂		
Carbon tetrachloride	CCl ₄		
Sodium hydroxide	NaOH		

