

Unit 3

NAME

Class Work

10/31/13

3.1 Atoms, Elements and Compounds

SPARK

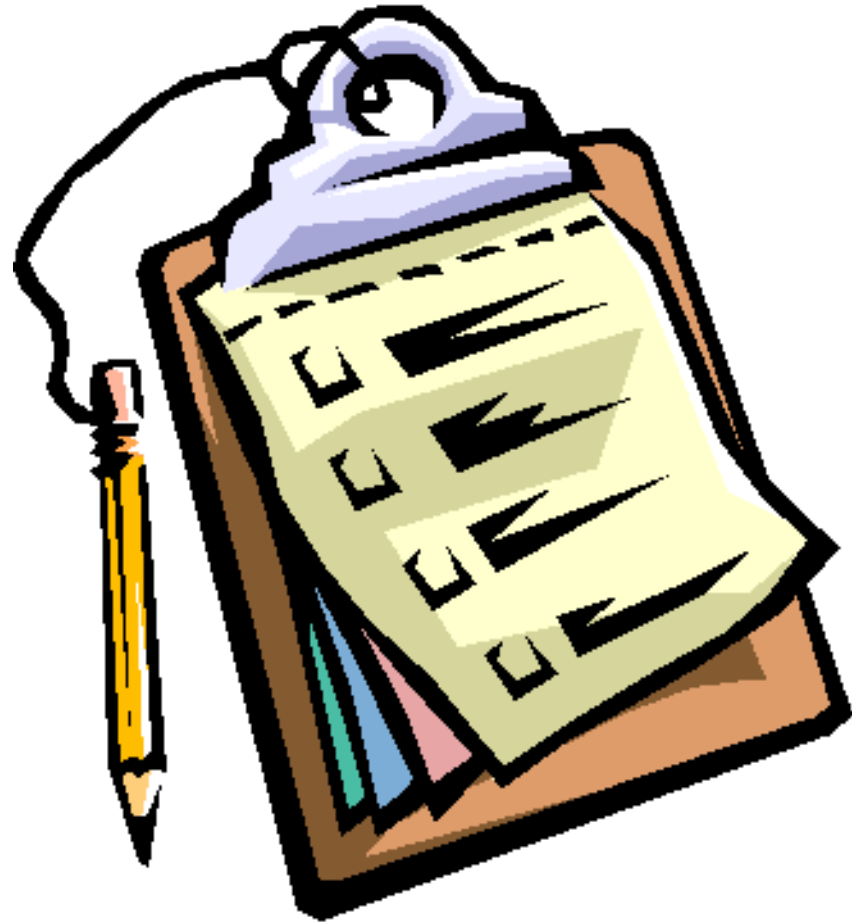
1. What do you already know about atoms???

Objectives

SWBAT use particle diagrams to differentiate among elements, compounds, and mixtures and interpret and write chemical formulas of compounds

Agenda:

- SPARK
- Objective
- Notes
- Practice
- Homework



Democritus

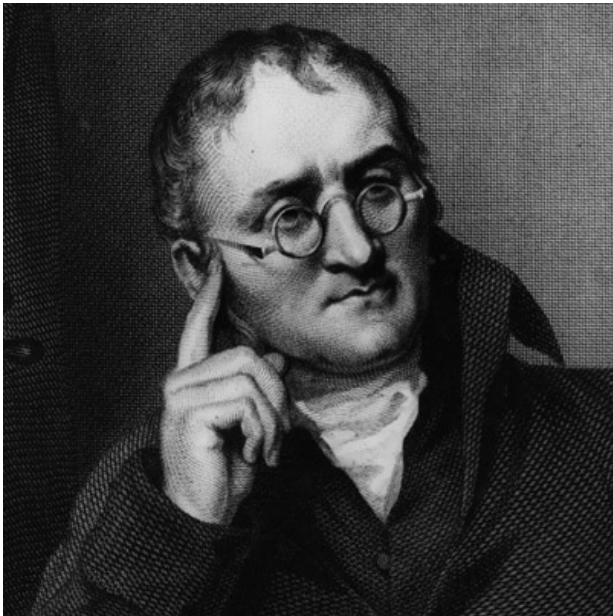
- Democritus, a Greek philosopher, believed that everything was made of small indivisible and indestructible particles.



460 BC

Dalton

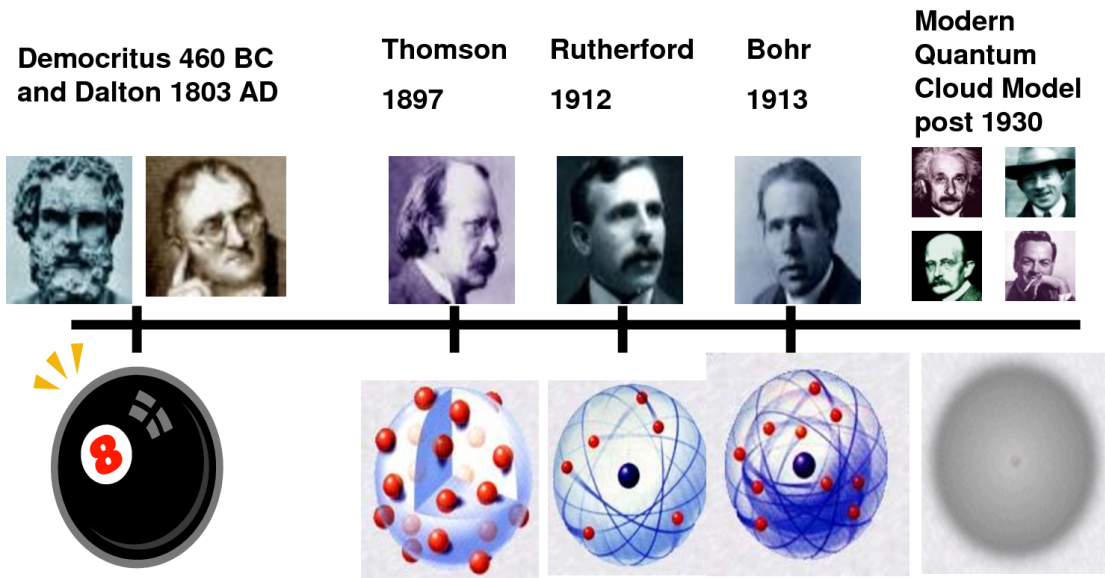
- Used experimental methods to transform Democritus' ideas about atoms into scientific theory



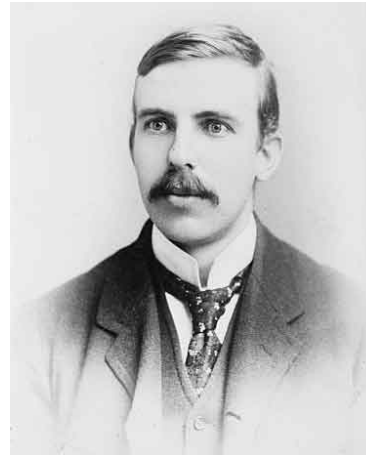
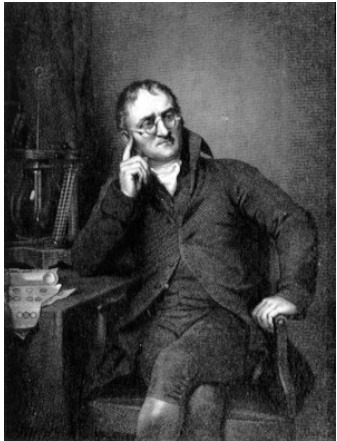
Atom*

- Smallest building block of matter and smallest particle of an element that has the chemical properties of that element

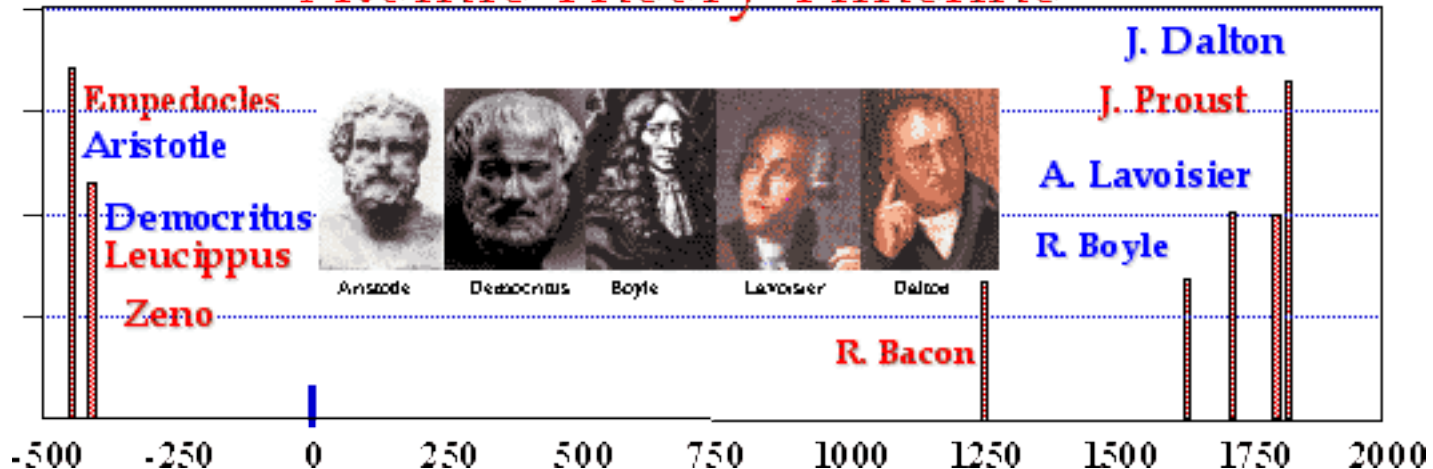
History of the Atom Timeline



Many Key Players in Modern Atomic Theory

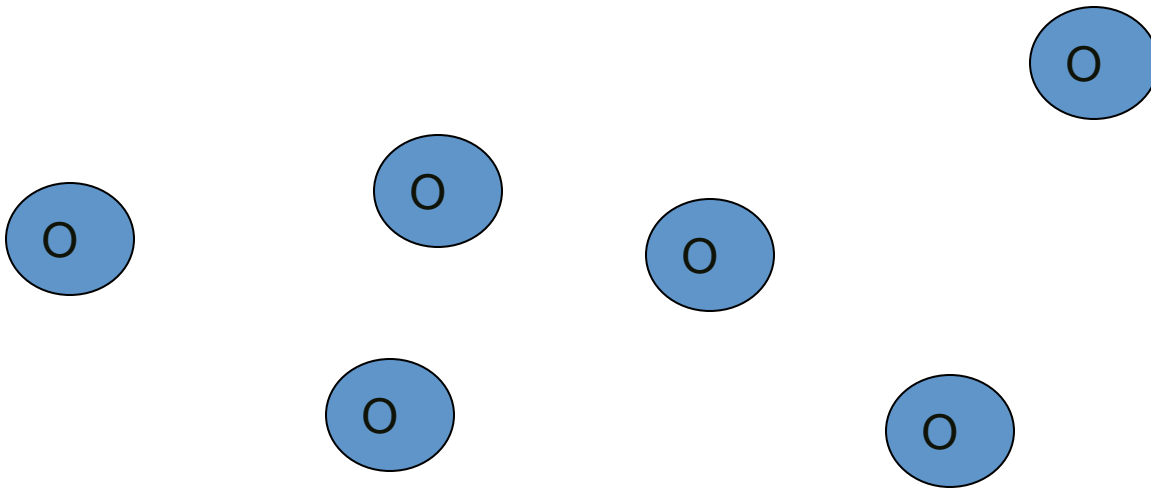


Atomic Theory Timeline



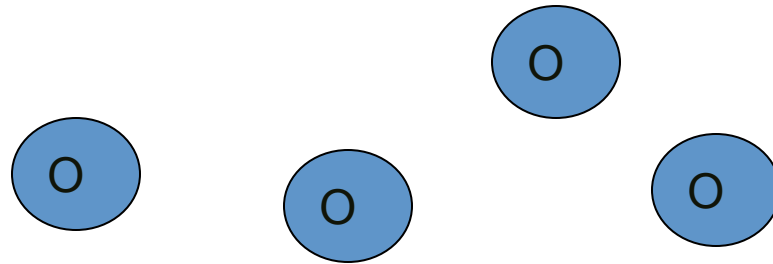
Dalton's Atomic Theory

1. All elements are composed of tiny indivisible particles called ATOMS.

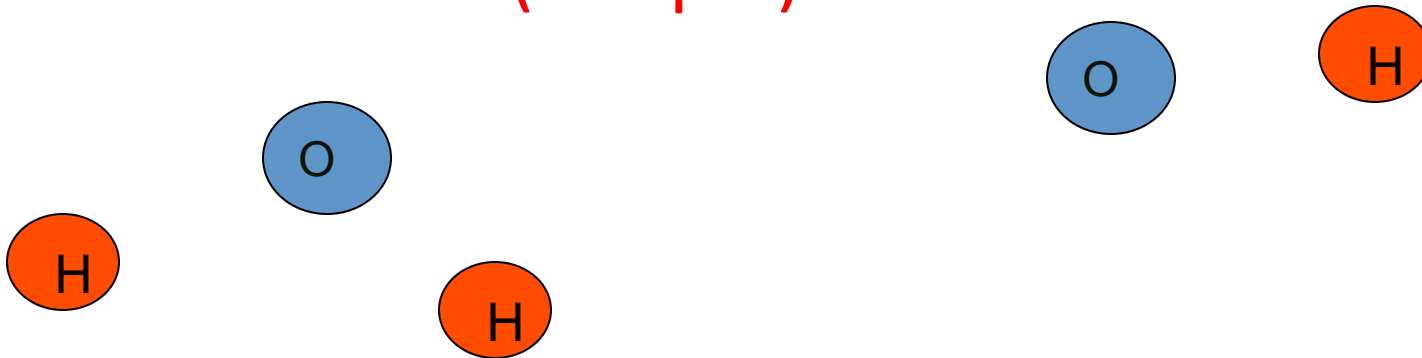


Dalton's Atomic Theory

2. Atoms of the same element are identical.



3. Atoms of an element are different from every other elements (unique).



Element*

- Pure substance made of only one kind of atom that cannot be broken down by physical or chemical means

Periodic Table of Elements

1 H																	2 He						
3 Li	4 Be																	5 B	6 C	7 N	8 O	9 F	10 Ne
11 Na	12 Mg																	13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr						
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe						
55 Cs	56 Ba	*La	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn						
87 Fr	88 Ra	+Ac	Rf	Ha	106	107	108	109	110														

* Lanthanide Series

+ Actinide Series

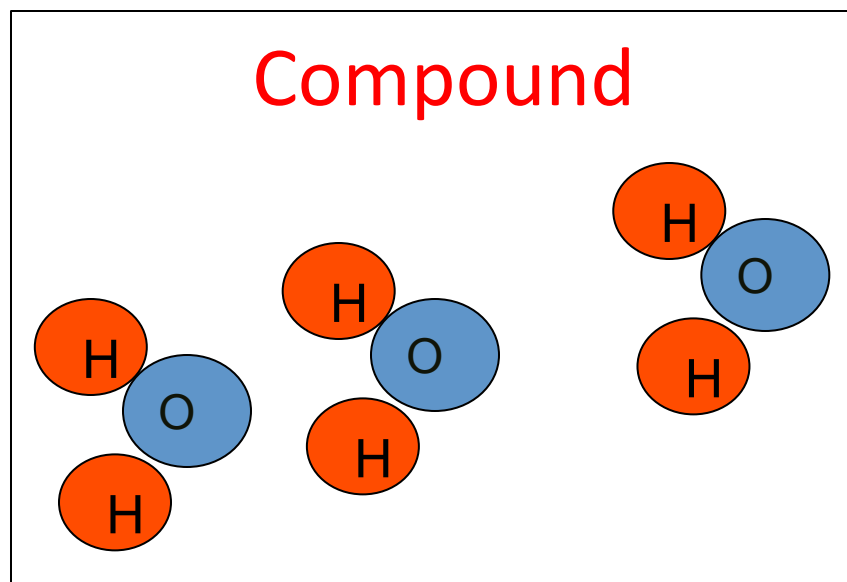
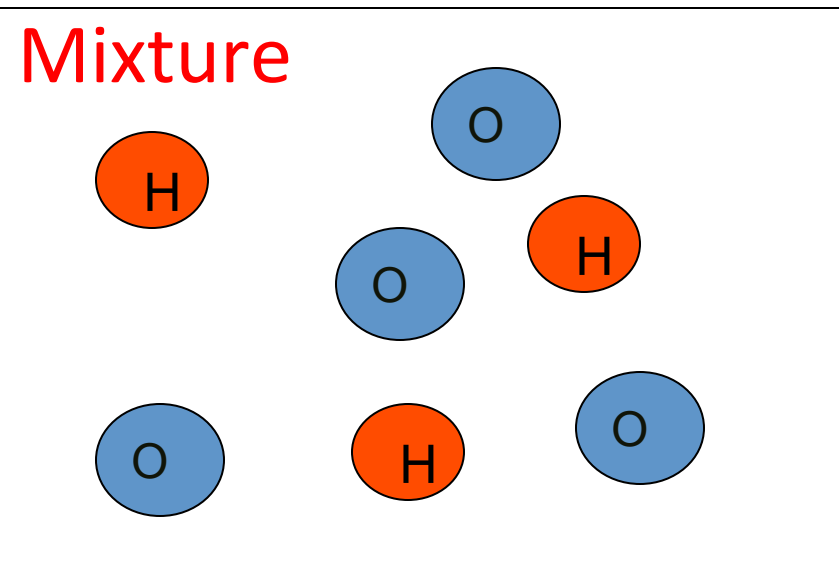
58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

Legend - click to find out more...

H - gas	Li - solid	Br - liquid	Tc - synthetic
Non-Metals	Transition Metals	Rare Earth Metals	Halogens
Alkali Metals	Alkali Earth Metals	Other Metals	Inert Elements

Dalton's Atomic Theory

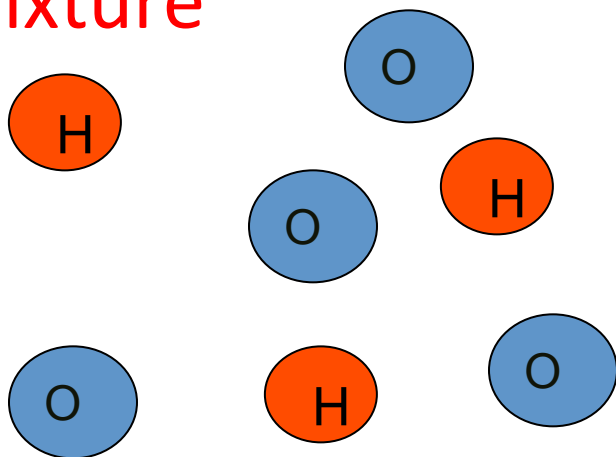
3. Atoms of different elements can physically mix together to form a mixture...



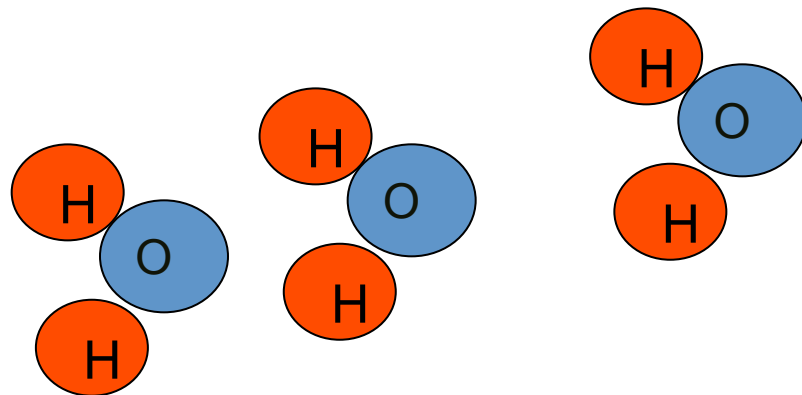
...or atoms of different elements can chemically combine in a fixed whole number ratio to form compounds

Dalton's Atomic Theory

Mixture



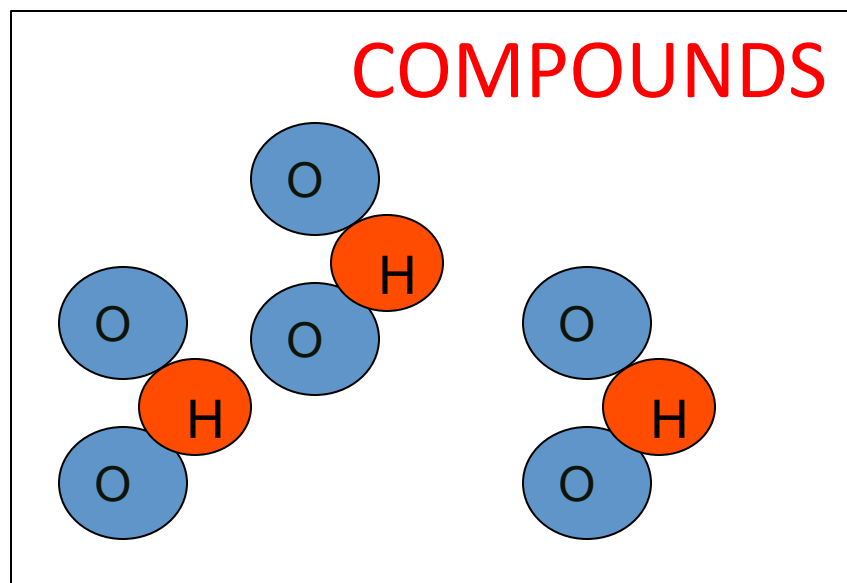
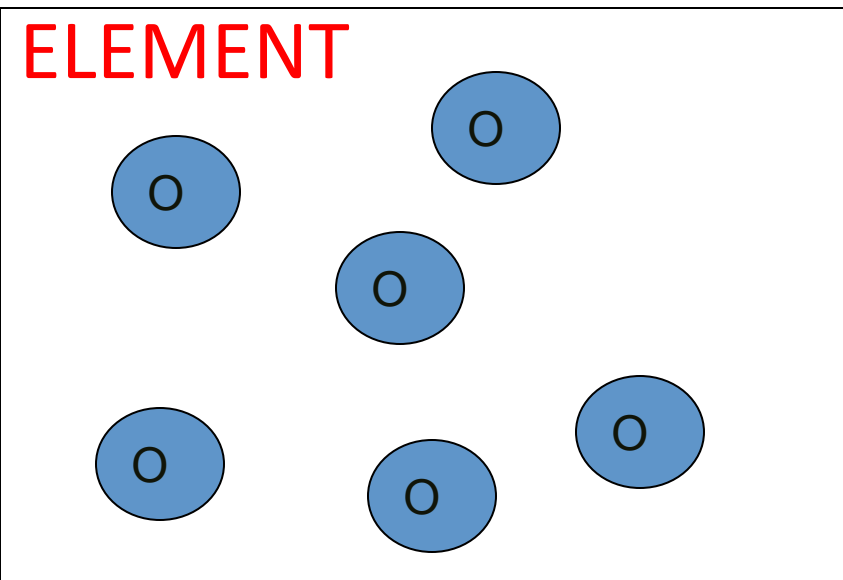
Compound



...or atoms of different elements can chemically combine in a fixed whole number ratio to form compounds

Dalton's Atomic Theory

Pure Substance* – Substance that cannot be separated by physical means (boiling, filtering, etc.)



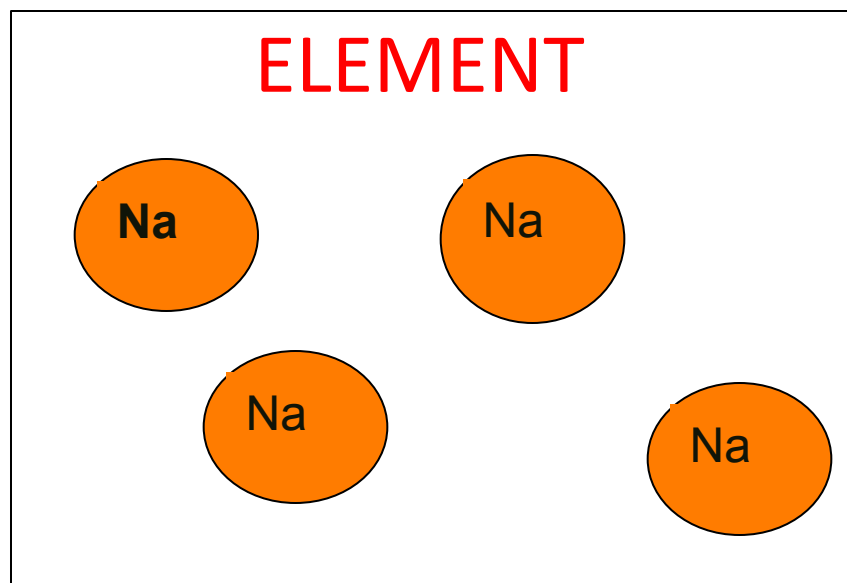
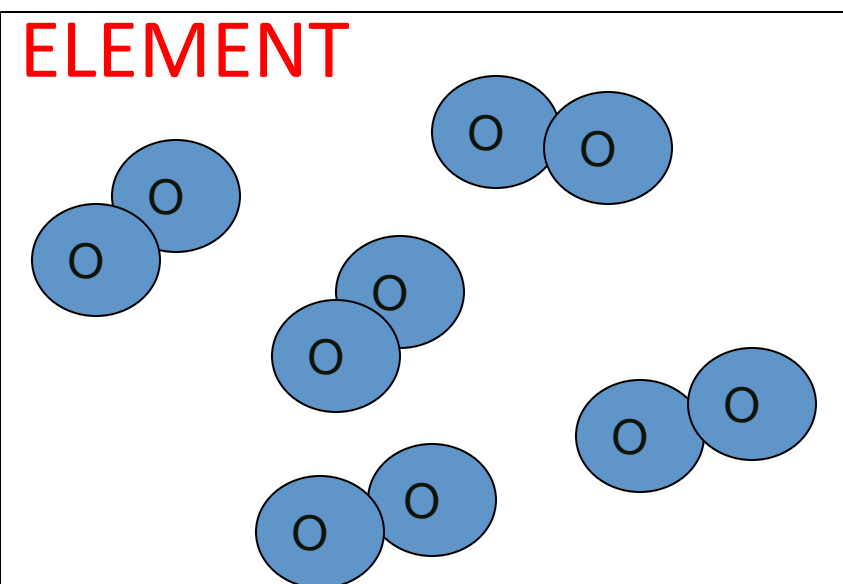
Compounds vs. Mixtures

What is the difference between compounds and mixture?

- Compounds*: substance made from the atoms of two or more elements that are chemically bonded
- Mixtures*: two or more pure substances that are physically combined

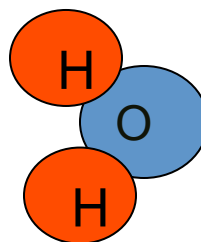
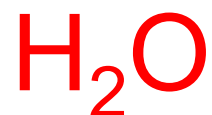
Dalton's Atomic Theory

NOTE: the same element bonded together is still just an element not a compound.



Dalton's Atomic Theory

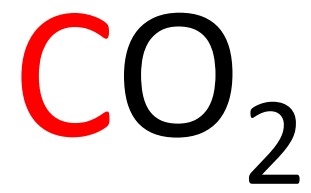
Examples of Compounds:



1 Copper, 2 Nitrogen, 6 oxygen



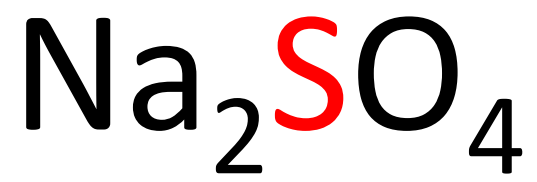
Hold up the number of fingers
to indicate how many atoms of
the element in **RED** exist in the
compound





1 Carbon

2 Oxygen





2 Sodium

1 Sulfur

4 Oxygen



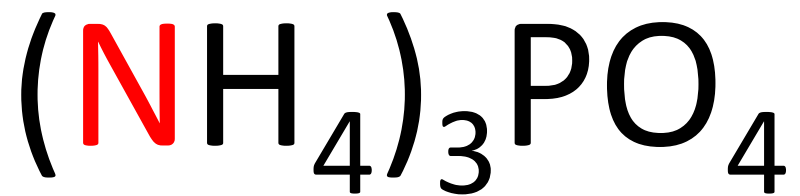


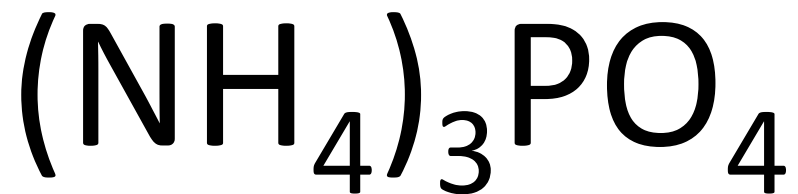
1 Iron

2 Nitrogen

6 Oxygen







3 Nitrogen

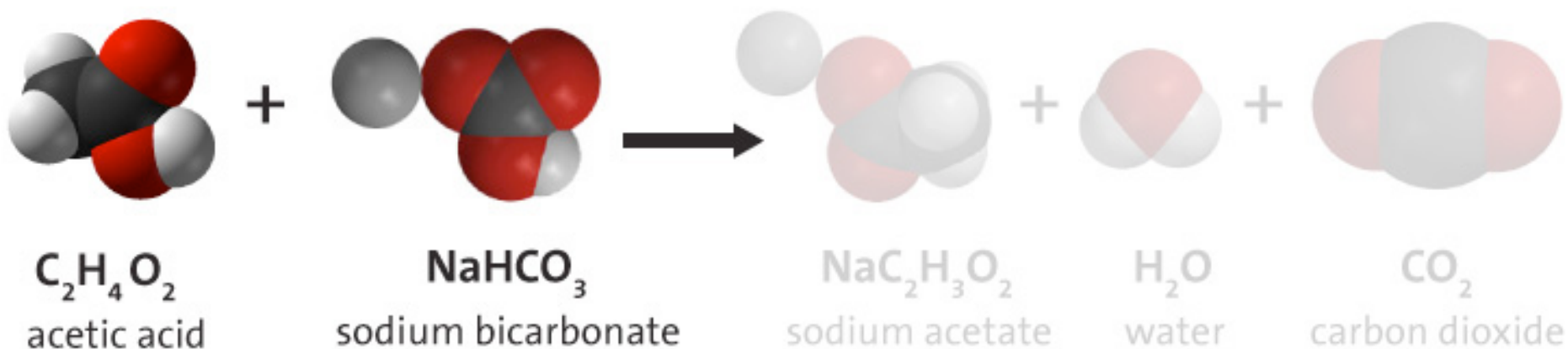
12 Hydrogen

1 Phosphorus

4 Oxygen

Dalton's Atomic Theory

5) In chemical reactions, atoms are combined, separated, or rearranged. Atoms cannot be created or destroyed.



Group Practice

#1: I am looking at atoms under a super strong microscope and I see magnesium and oxygen.
How do you determine if it's a mixture or a compound?

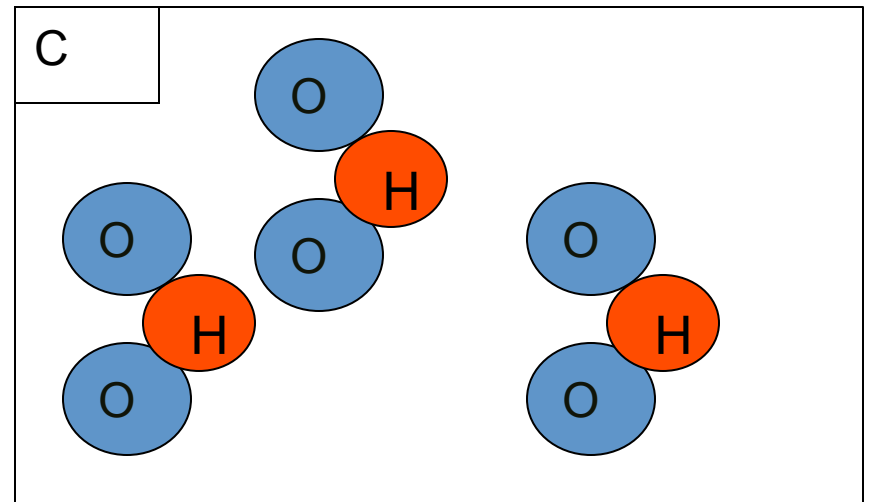
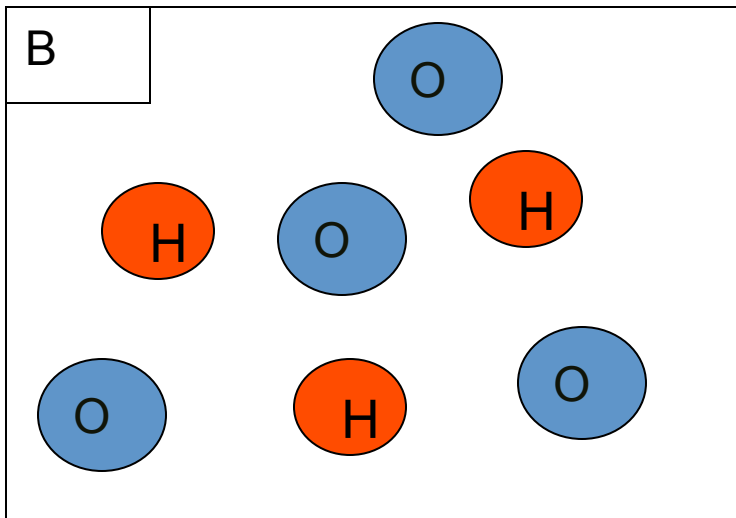
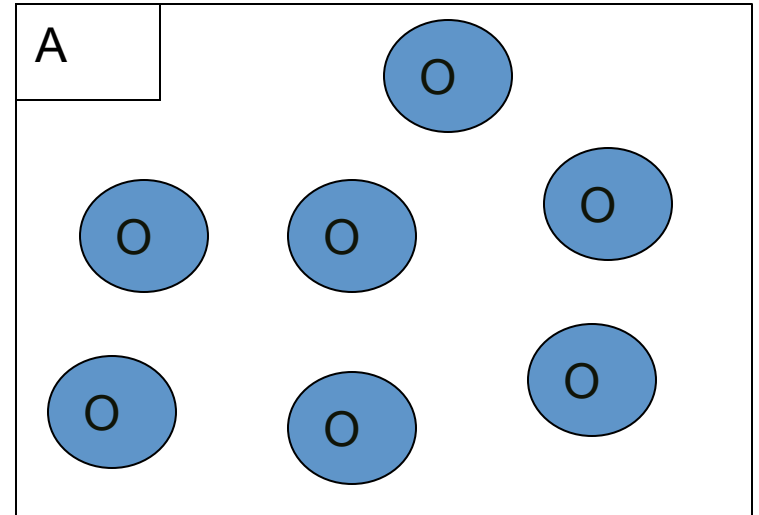
Group Practice

#2. Which two substances can *not* be broken down by chemical change?

1. C and CuO
2. C and Cu
3. CO₂ and CuO
4. CO₂ and Cu

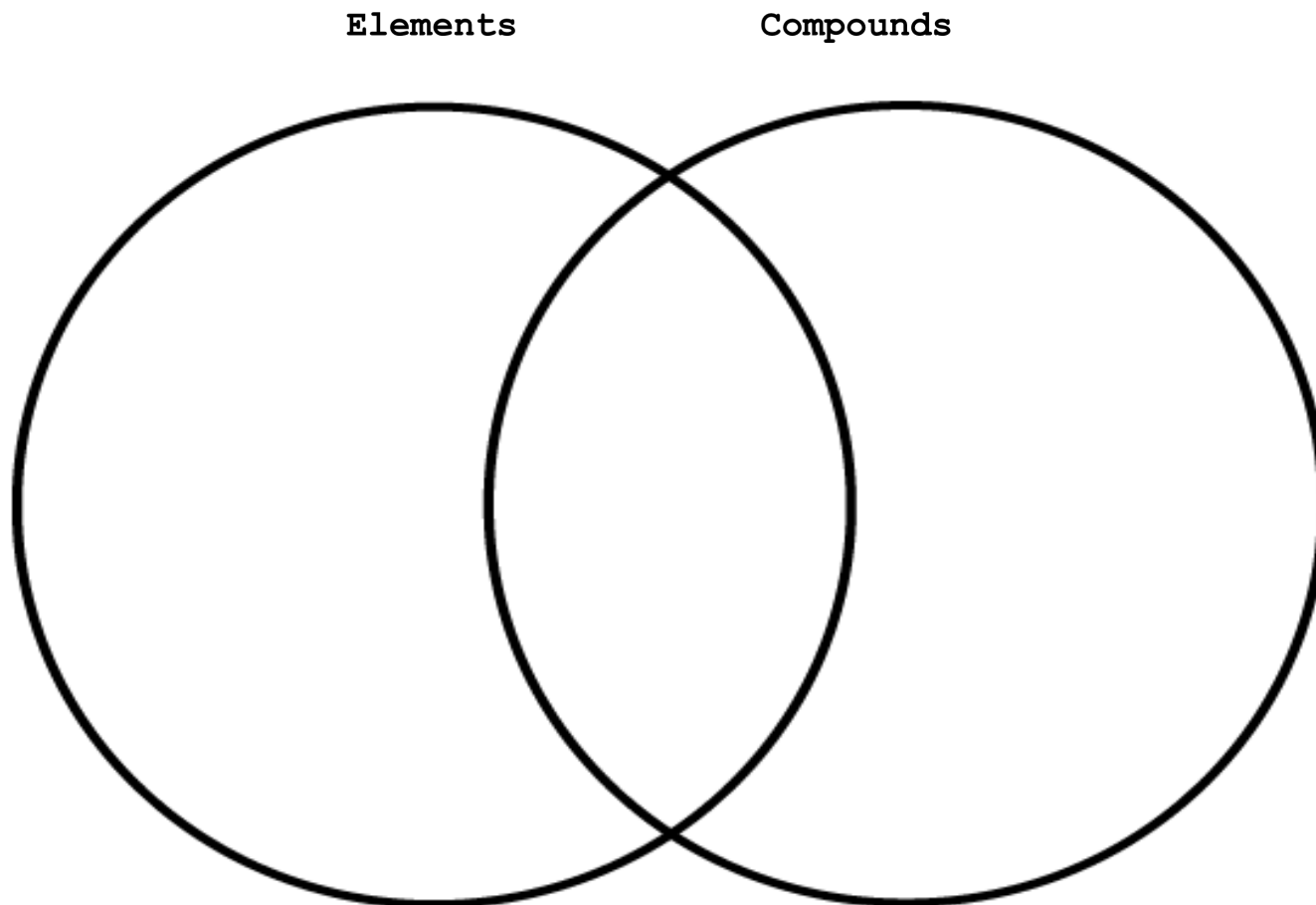
Reflection

#3. Using Dalton's postulates, explain the difference between the three pictures below:



Independent Practice

Complete Venn Diagram!



HOMEWORK

Complete 3.1 HW

Element symbol and atomic number quiz
tomorrow!!