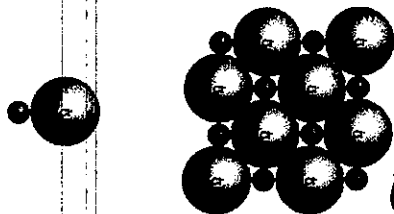


Elements, Compounds & Mixtures!



Unit 4-1

I. What are Elements?

- An _____ is a pure substance that _____ into simpler substances by physical or chemical means.
- What are examples of elements?
 - Anything that is on the *Periodic Table of Elements*.
 - Examples: _____ (Au), Silicon (Si), Neon (Ne), _____ (Ag), sulfur (S)



II. Identifying Elements

- Elements are categorized by unique properties on the Periodic Table.
- They are arranged in order by their number of _____. (More on this later!)
- Each element has unique properties like melting point, boiling point, and whether it is _____.

II. Identifying Elements

H	He																	He
Li	Be											B	C	N	O	F	Ne	
Na	Mg											Al	Si	P	S	Cl	Ar	
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	
Cs	Ba	*Lu	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn	
Fr	Ra	**Lr	Rf	Db	Sg	Bh	Hs	Mt	Uun	Uuu	Uub	Uuq						
*Lanthanide series																		
**Actinide series																		

- Everything that is on the Periodic Table is an _____. If it isn't on this table, it isn't an element!
- Each element has a chemical symbol to represent it.
 - For example: _____ is the chemical symbol for _____.
 - Each chemical symbol has only 1 capital letter.
 - Example - Na – Sodium
 - Example – Mg – Magnesium

The Periodic Table of Elements

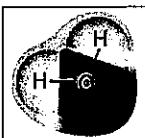
H	He																	He
Li	Be											B	C	N	O	F	Ne	
Na	Mg											Al	Si	P	S	Cl	Ar	
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	
Cs	Ba	*Lu	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn	
Fr	Ra	**Lr	Rf	Db	Sg	Bh	Hs	Mt	Uun	Uuu	Uub	Uuq						
*Lanthanide series																		
**Actinide series																		

III. Pure Substances

- a. _____ are substances in which there is only _____.
- b. These particles are called _____.
- c. The only two things that are pure substances are:

1. _____

2. _____



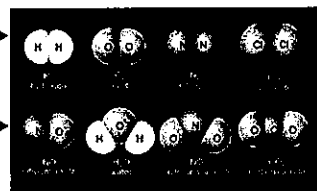
IV. What are Compounds?

- a. A _____ is a pure substance composed of _____ elements chemically combined.
- b. This means they were formed by a chemical reaction.

Elements →



Compounds →



Familiar Compounds

Compound	Elements Combined	Formula
Table salt	Sodium and Chlorine	NaCl
Water	Hydrogen and Oxygen	H ₂ O
Vinegar	Hydrogen, Carbon, and Oxygen	C ₂ H ₄ O ₂
Carbon dioxide	Carbon and Oxygen	CO ₂
Baking soda	Sodium, Hydrogen, Carbon and Oxygen	NaCHO ₃

V. Forming a Compound

a. Compounds are formed by combining **two** or more _____ elements.

- Elements are "stuck together" by chemical bonds.
- When this happens, new properties are formed; the elements lose their original properties.

ii. You end up with one new thing (A CHEMICAL CHANGE HAS OCCURED!)

b. ELEMENTS MAKE _____ !!

Example: Formation of NaCl



Sodium is a soft, silvery white metal that reacts violently with water.

+



Chlorine is a poisonous, greenish-yellow gas.

→



Sodium Chloride, or table salt, is a white solid. It dissolves easily in water and is safe to eat.

****Compounds have properties that differ from those of the elements that form it!****

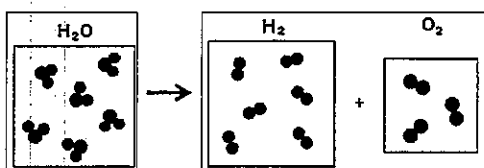
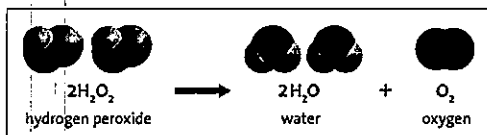
VIII. Separation of Compounds

a. Compounds are broken apart by breaking chemical bonds.

- You separate them by forcing another _____ to happen
- CHEMICAL CHANGE NEEDS TO OCCUR**
- Add **heat, electricity, another** _____ or _____ as a chemical reaction

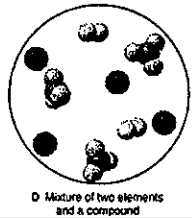
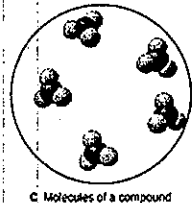
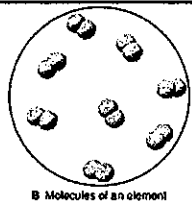
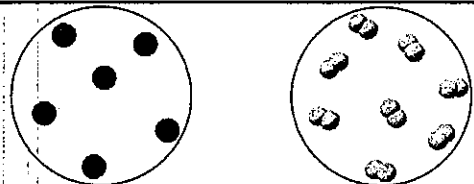
b. Remember compounds are specific recipes! They have a **fixed ratio!**

Breaking Chemical Bonds



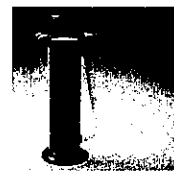
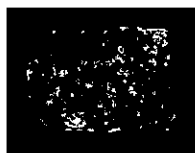
IX. What is a Mixture?

- A _____ is when **2 or more substances are combined** but _____ chemically react.
- THE SUBSTANCES KEEP THEIR OWN PROPERTIES!!
- We say that we _____ to form them.



d. Examples of Mixtures

- _____
- Granite
- _____
- Oil and vinegar



e. 3 Properties of a Mixture

- It is **NOT** a chemical change
- It can be separated by _____
- Ratio of each substance does **NOT** matter

f. Separation of a Mixture

- Separating a mixture is a _____ **CHANGE** because there are no _____ or changes - parts keep their properties!!
- Examples:
 - Pick apart or straining
 - Evaporation
 - _____
 - Centrifuge
 - Distillation (boiling the solvent to separate it from the solute)
 - Magnetism (like iron)

g. Types of Mixtures

i. Homogeneous
(Homo = same)



1. The mixture appears to be the **SAME** throughout
2. Examples- milk, stainless steel, oil

ii. Heterogeneous
(Hetero = different)



1. The mixture appears to be **DIFFERENT** throughout
2. Examples- concrete, soil, pizza

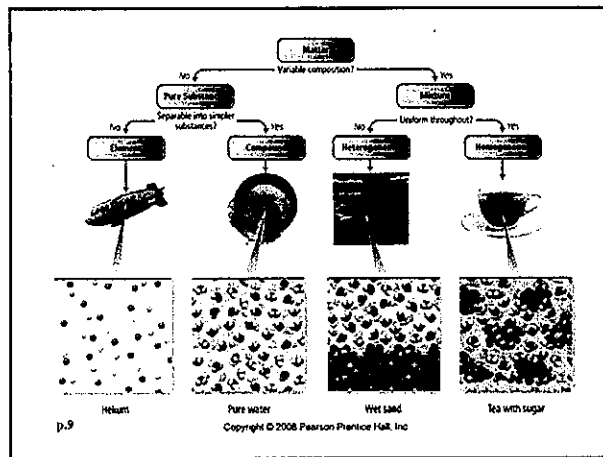
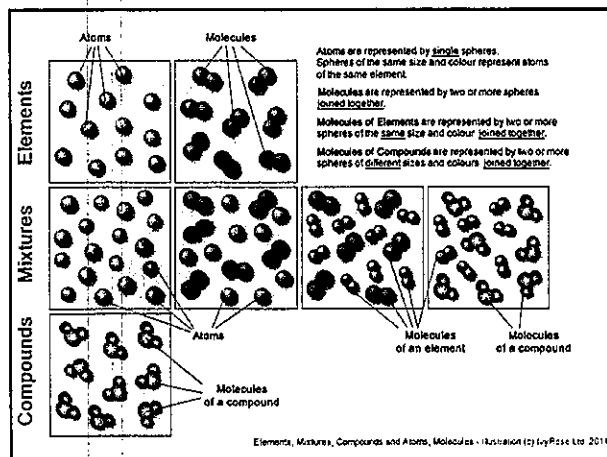
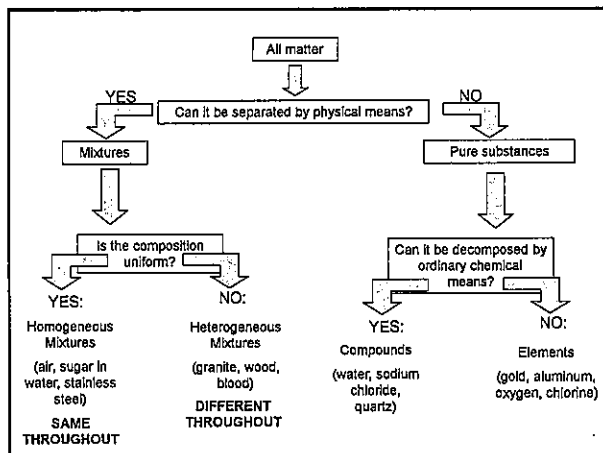
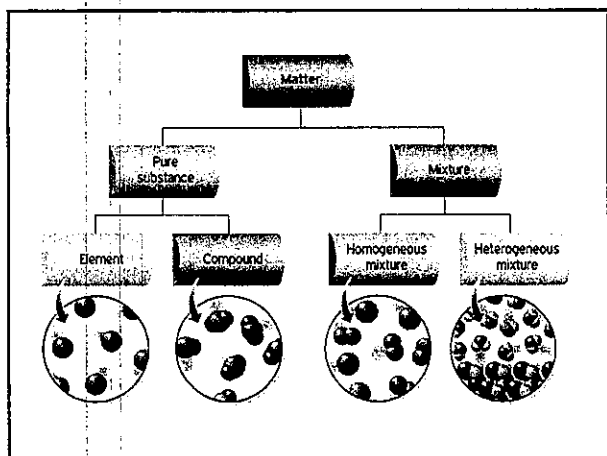
Examples

HOMOGENEOUS

- Milk
- Stainless steel
- Oil
- Brass (Cu + Zn)

HETEROGENEOUS

- Oil & vinegar
- Concrete
- Soil
- Pizza, Cereal



Element, Compound or Mixture?

- Rocks? _____
- Copper? _____
- Jelly beans? _____
- Table sugar? _____
- Diamond? _____
- Tea? _____

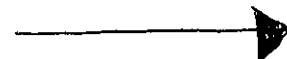
Element, Compound or Mixture?

- Salt? _____
- Neon gas? _____
- Salad? _____
- Water _____
- Aluminum _____
- Lemonade _____
- Silver _____
- Sand _____

Notes

- Detailed notes are located at:
<http://www.middleschoolscience.com/elements-compounds-mixtures-notes-isn.pdf>
- Flow Chart:
<http://www.middleschoolscience.com/matter-flow-chart-isn.pdf>

OVER



How are Mixtures and Compounds Different

Mixture

- Made of 2 or more substances **physically** combined
- **Keep** their own properties
- Can be **separated** by physical means
- Have no definite chemical composition

Compound

- Made of 2 or more substances **chemically** combined.
- Substances lose their own properties.
- Can be **separated** only by chemical means.
- Have a definite chemical composition.

