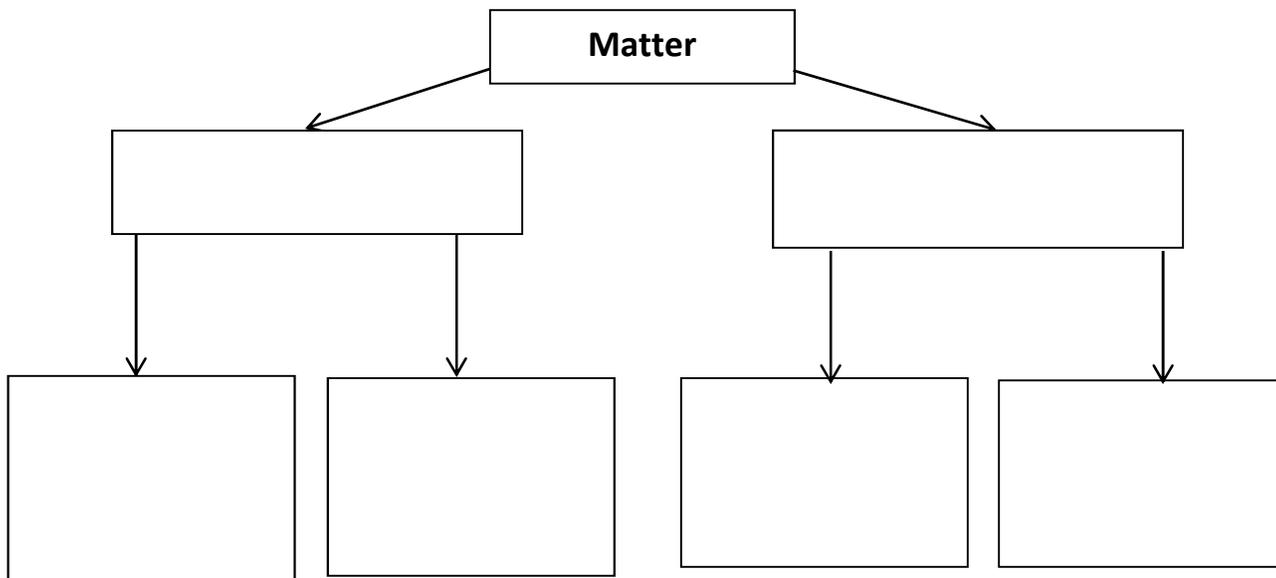


Properties of Matter Review

Chemistry is the study of the properties and interactions of matter

- **Matter**= _____
- **Atom**= _____

Atoms can combine or join together to form other substances:



Pure Substances=a substance that _____ be _____
_____. They can be separated by a chemical process ONLY

There are 2 types of pure substances: elements and compounds.

- **Element**=a substance that is made up of _____

Elements _____ be broken down into _____

All the elements that we know of are organized in the _____

- **Diatomic Elements**= _____

(H₂, N₂, O₂, F₂, Cl₂, Br₂, I₂... "7-UP")

- **Compound**= a substance that is made up of _____. Therefore, a compound is made up of _____ in a specific ratio.

Compounds can be _____ into the elements that make it up.

• **Mixtures**=a combination of _____ that
 can be _____

Mixtures can be made up of elements, compounds, or both.



Mixture

Can be physically separated into its individual parts without changing what they are

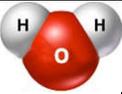
Mixtures can be classified as either homogeneous or heterogeneous

- **homogeneous mixture**=a mixture in which the particles are _____
 the individual substances making up the mixture _____
 (Ex: sugar dissolved in water; atmospheric air);
***most common type is a _____!**
- **heterogeneous mixture**=a mixture in which the particles are _____
 the individual substances making up the mixture _____
 (Ex: chocolate chip cookie, sand in water)

Practice: Pure Substance or Mixture?

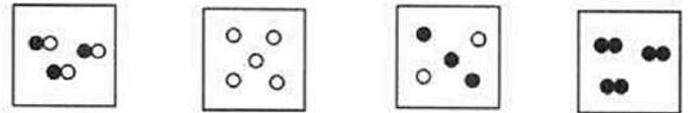
-If it is a pure substance, indicate whether it is an element or compound

-If it is a mixture, indicate whether it is a homogeneous or heterogeneous mixture

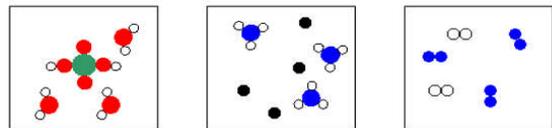
M&M's		
sucrose (C ₁₂ H ₂₂ O ₁₁)		
Lemonade		
Iron nails		
Air (nitrogen + oxygen + other gases)		
Limestone (CaCO ₃)		
Magnesium		
Pure Water		
Tap Water		

Particle Diagrams Practice Questions

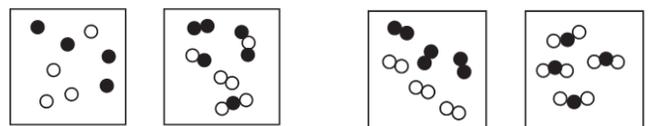
1. Label each particle diagram as an element, compound, or mixture.



2. Which of the following particle diagrams represents a mixture of one compound and one element?



3. Which particle model represents only one compound composed of elements X and Z?



Properties of Matter

***Physical Property=** _____

Ex: _____

***Chemical Property=** _____

Ex: _____

***Intensive Property=** _____

Ex: _____

***Extensive Property=** _____

Ex: _____

Practice: Identify the following properties as either chemical or physical. In addition, identify it as intensive or extensive.

Trait/characteristic	Chemical (C) or Physical (P)	Intensive (I) or Extensive (E)
Boiling point		
Density		
Color		
Flammability		
Solubility in water		
Texture		
reacts with water to form a gas		
Malleability		
Melting point		
Combustibility		
Volume		
reacts with acid		
Blue appearance		

Separation Techniques

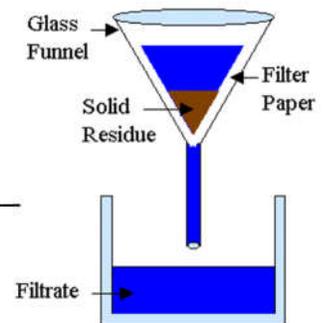
Recall, a **mixture** is a combination of _____ that you can _____ into their individual parts _____ what they are. Mixtures can be separated based on their _____ **properties**

1. Filtration

- separation based on different _____ or _____

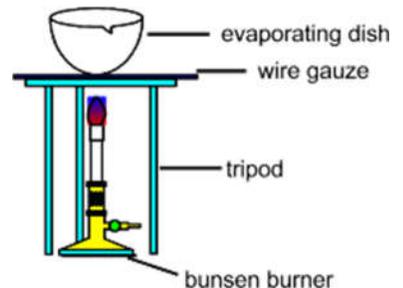
allows you to separate a _____

by catching the _____ on the _____



2. Evaporation

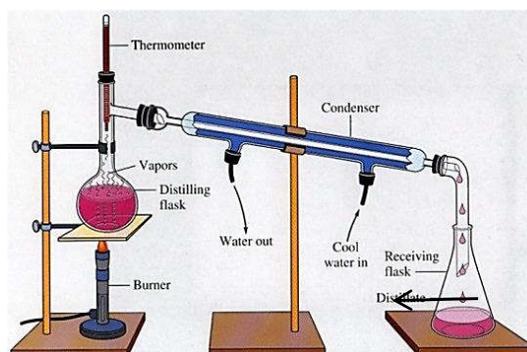
- takes advantage of differences in _____
- can be used to separate _____ mixtures
- Downside: liquid components of mixture are lost to air through evaporation



3. Distillation

- takes advantage of differences in _____
- can be used to separate _____ mixtures
- Superior method to evaporation because all components can be isolated and retained.

Mixture of 2 liquids is placed in a flask over a heat source. The liquid with the _____ boiling point stays in this flask



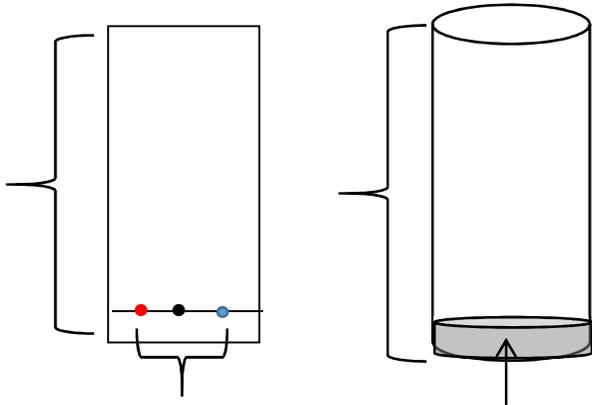
The liquid with the _____ boiling point collects in this flask

4. **Chromatography**=a technique that allows you to separate a _____ based on _____ and/or _____

*polarity= _____

Types of Chromatography:

i. Paper Chromatography

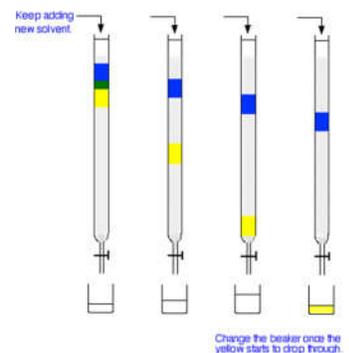


- How the components separate depend on how attracted the individual components are to the _____ versus the _____
- If the components are more attracted to the solvent, _____

- “Like dissolves like”

ii. Column Chromatography

- Separates the components of a mixture based on the differences in _____
 - The _____ molecules exit the column first
 - The _____ molecules exit the column last
- Separation can also be based on polarity (attraction) to the material in the column



5. Others include **sifting, magnetism, etc.**

Separation Techniques Practice

Mixture	Type of Mixture	Differing Physical Properties	Possible Separation Techniques
Ex: Sugar dissolved in water	Homogeneous	*boiling point	*evaporation *distillation
Coffee grounds and water			
Crude Oil (mixture of different hydrocarbons)	Homogeneous	*boiling point	
Water + Barium Sulfate (Barium Sulfate is insoluble in water)			
Mixture of pigments found in a plant leaf: (chlorophyll a/b, xanthophylls, carotene)	Homogeneous	*size *polarity	