

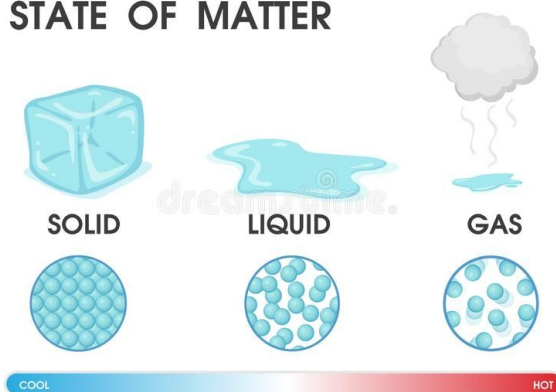
Aim: I can recognize physical and chemical properties and changes in matter



WHAT IS MATTER?

- Anything that has mass and takes up space

STATE OF MATTER



PHYSICAL PROPERTIES

- Used to identify, describe, and classify matter
- Can be observed
- Examples:
 - Color
 - Phase at room temperature
 - Shape
 - Heat conductivity
 - Electrical conductivity
 - Freezing or boiling point
 - Texture
 - Density
 - Hardness
 - Odor
 - Viscosity



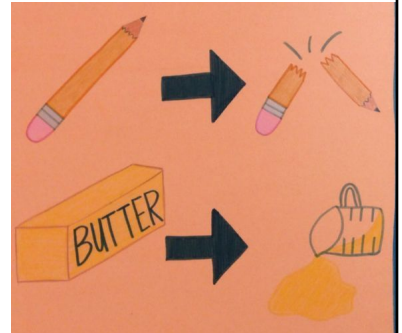
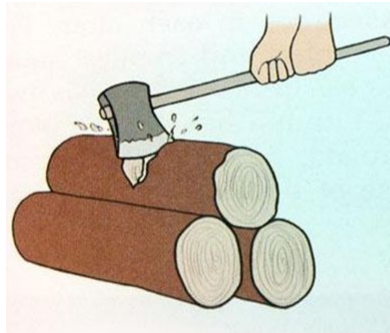
CHEMICAL PROPERTIES

- Describe how a substance changes into a new substance
- Examples:
 - Ability to burn (flammability)
 - Ability to rust
 - Ability to react with acids



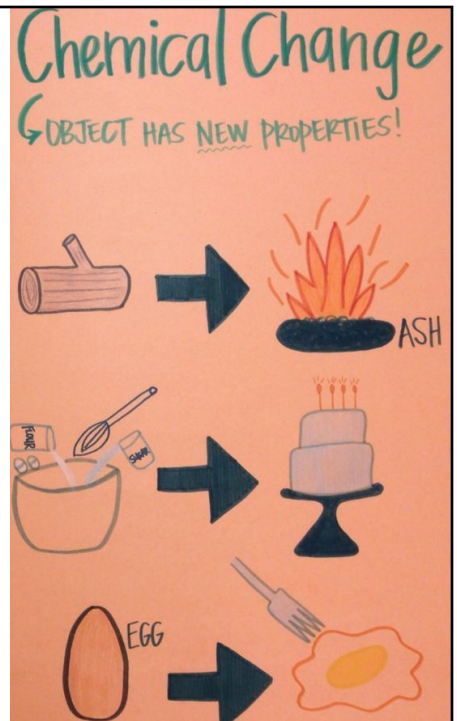
PHYSICAL CHANGES

- Matter changes (state or phase) but keeps its chemical composition and properties
- Examples:
 - Phase changes (freezing, melting, condensation, evaporation)
 - Tearing
 - Crushing

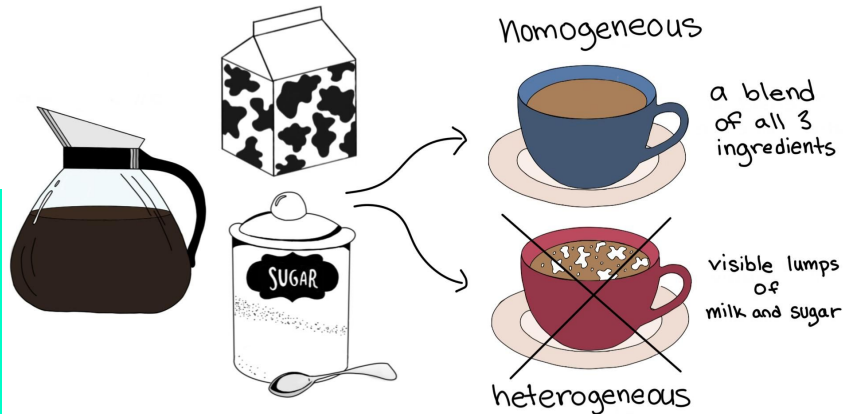


CHEMICAL CHANGES

- New substances are formed with different chemical properties
- Indicated by bubbles, heat production, light production, changes in color, smoke
- Examples:
 - Burning wood
 - Cooking food
 - Iron rusting
 - Milk souring

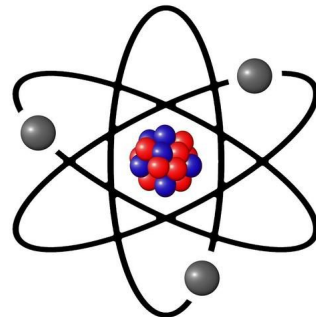
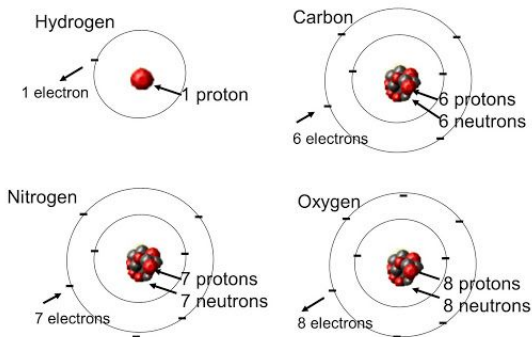


Aim: I can classify mixtures as homogeneous or heterogeneous

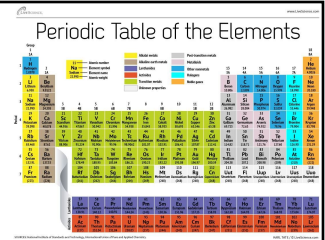


ATOMS & ELEMENTS

- The basic particles from which all elements are made
- Elements are materials listed in the Periodic Table



ELEMENTS



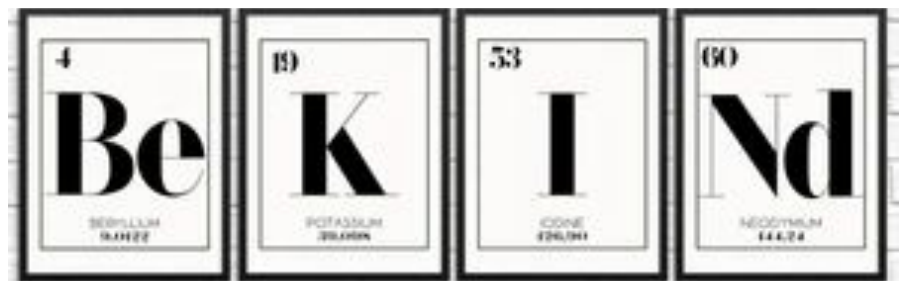
A standard periodic table of elements, color-coded by groups. It includes element symbols, atomic numbers, and names. The title 'Periodic Table of the Elements' is at the top right.

- Found on the Periodic Table of Elements
- All atoms in the sample have the same identity.
 - They are pure
 - Cannot be broken into smaller, pure substances

Examples:

- Na (sodium), Fe (iron), Mg (magnesium), Zn (zinc)
- Every time you see a new capital letter, it's a new element!

ELEMENTS

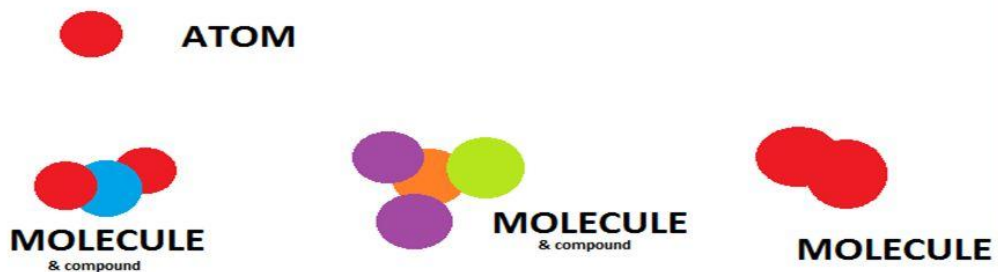


Four element cards are shown side-by-side. Each card displays the atomic number, symbol, and name of an element.

Atomic Number	Symbol	Name
4	Be	Beryllium
19	K	Potassium
53	I	Iodine
60	Nd	Neodymium

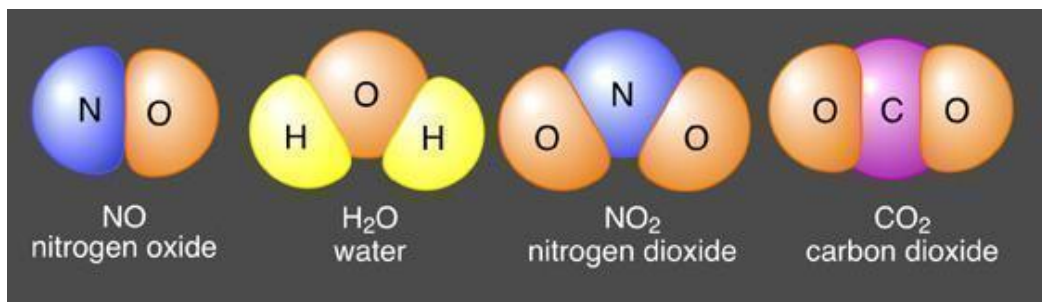
MOLECULES

- Any 2 or more elements combined (chemically bonded together)
- Ex: O_2 (oxygen), H_2O (water), CO_2 (carbon dioxide)



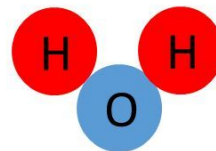
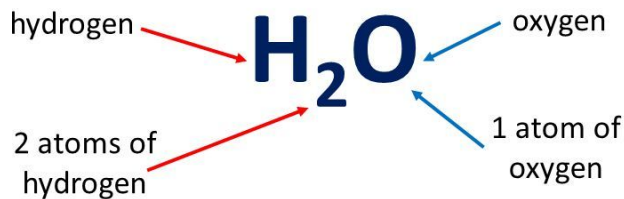
COMPOUNDS

- Are made from two or more **different** elements combined.
- Ex: H_2O (water), CO_2 (carbon dioxide)



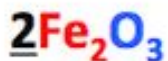
CHEMICAL FORMULAS

- Example: Water



2 DIFFERENT ELEMENTS, 3 TOTAL ATOMS, 1 MOLECULE

CHEMICAL FORMULAS



Fe = 4

O = 6

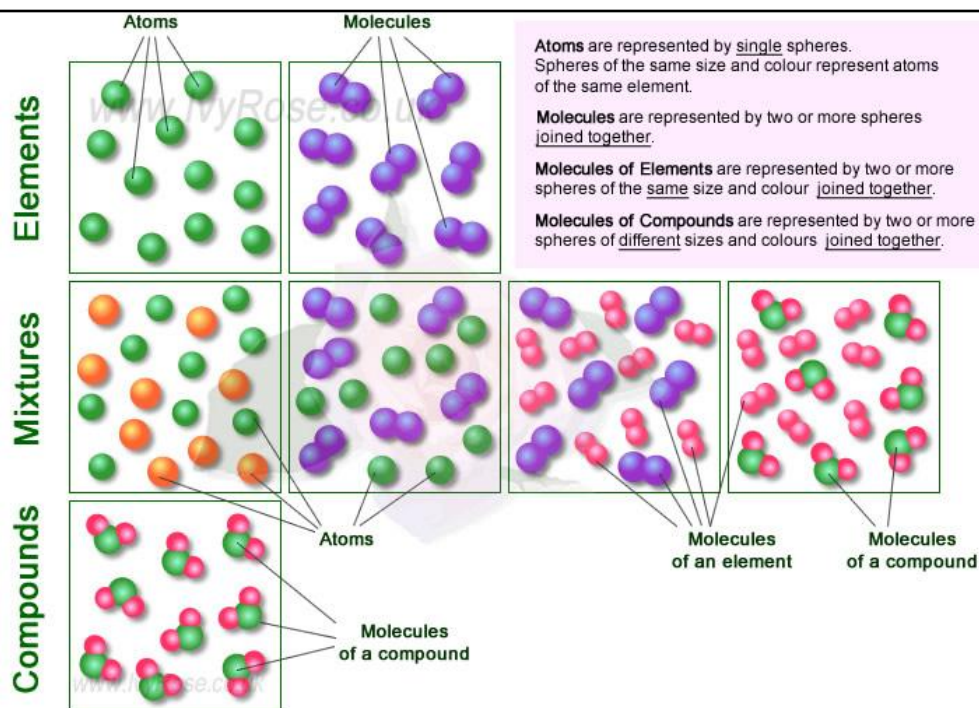
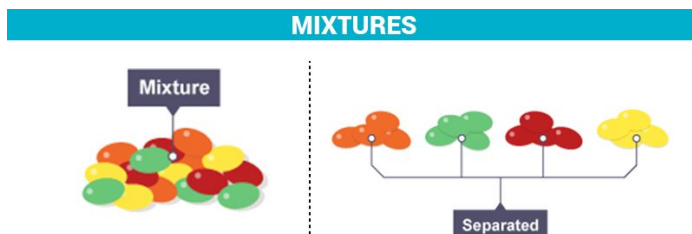
2 DIFFERENT ELEMENTS (**Fe and O**)

2 MOLECULES

10 TOTAL ATOMS

MIXTURES

- A major characteristic of mixtures is that the materials DO NOT chemically combine.
- Since these mixtures are just physical blends, they can be separated easily, by physical means (no chemical reactions required).



HOMOGENEOUS MIXTURES

- Homogeneous mixtures can also be called solutions(aq), and if something is a solution, it must be a homogeneous mixture.
- One phase with uniform properties throughout, having even mixtures of each component.
- Examples: salt water, coffee, tea

WHAT ARE HOMOGENEOUS MIXTURES?



HETEROGENEOUS MIXTURES

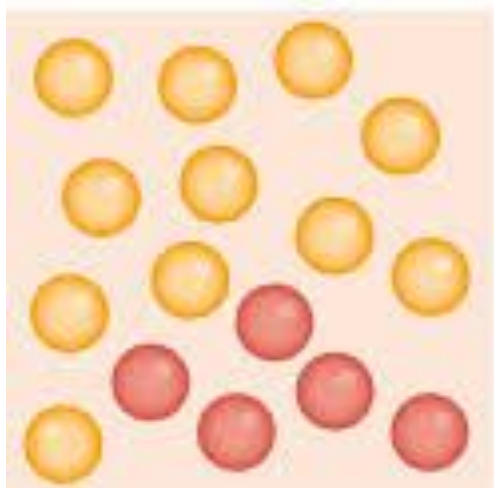
- Heterogeneous mixtures have parts that are noticeably different because they are in different phases, shapes and sizes.

- Uneven or non uniform composition

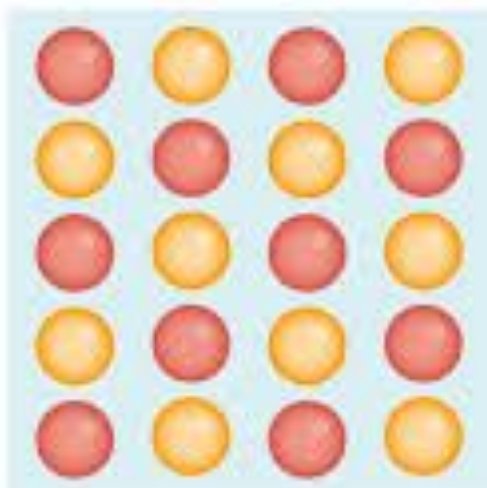


- Examples: granite, chicken soup, blood.

Heterogeneous mixture

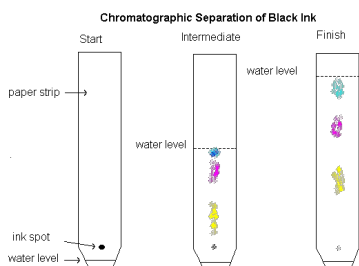


Homogeneous mixture



SEPARATING MIXTURES

- Sorting
- Magnetism
- Filtration
- Sifting or sieving
- Extraction and evaporation
- Chromatography



Separating Mixtures



Funnel



A funnel separates liquids from small solids.



Magnet



A magnet separates metals from nonmetals.



Boiling



Boiling separates solids from a liquid.