Matter

Physical Science Ch 15

Matter

Matter – any thing takes up space

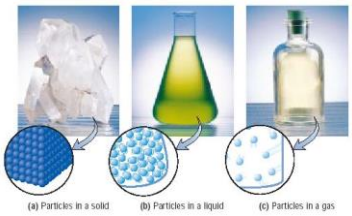
- **Mass**- how much matter an object or substance contains
- What is NOT matter?
  - Energy

- What are the two criteria for matter
  - Does it take up space?
  - Does it have mass?

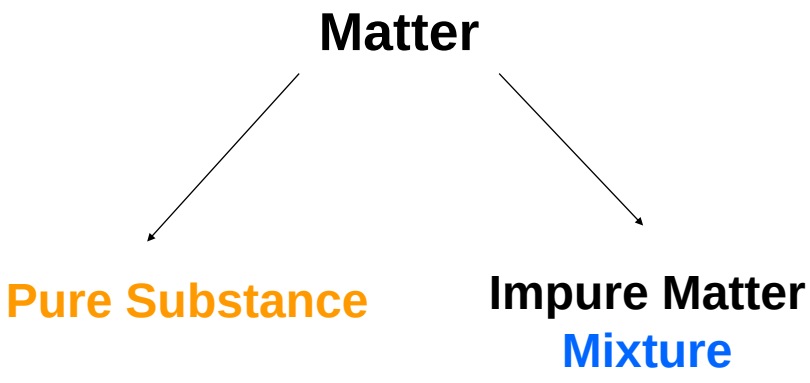
- Mass vs. Weight??
  - Mass doesn't change
  - Weight is a measure of the force of gravity pulling on a object

3 states of matter

- **Solid** – definite shape and volume
- **Liquid** – definite volume and takes shape of container
- **Gas** –takes the volume and shape of its container

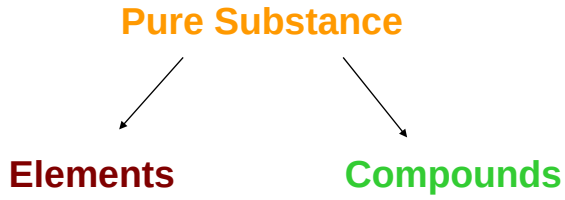


What is the composition of matter?

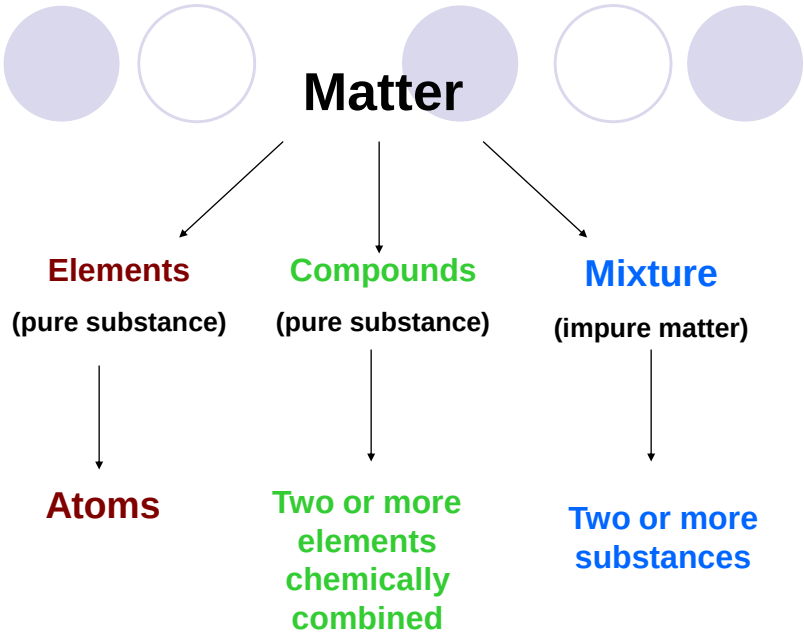


What is a pure substance?

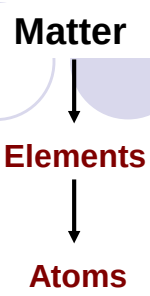
- **Types of Substances**



- A **pure substance** has a definite & uniform composition
  - Can **NOT** be separated by physical means
    - Compound can be separated into individual elements by chemical means



Types Matter: Elements



Elements

- Matter in which all the atoms are alike
- Matter which cannot be broken down any simpler
- Elements or atoms are called the basic building blocks of all matter
- **Atom** – smallest particle of element that maintains the properties of that element
- Each element is represented by a **chemical symbol**
  - All elements are listed on the periodic table

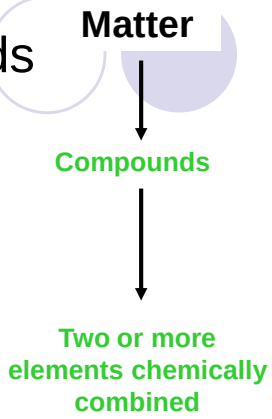
Examples:

H=*hydrogen*, **C**=*carbon*, **Na**=*sodium*, **Hg**=*mercury*

Chemical Symbol Facts

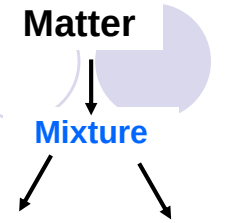
- One or two letters may be used.
- The first letter is upper case while the second is lower case
- Some symbols come from Latin or Greek names of the elements

Types of Matter: Compounds

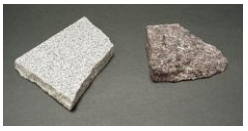


- **Compounds**
  - Combination of atoms of two or more elements
  - **Chemical Formula**
    - A combination of symbols that shows the ratio of elements in an compound
  - Compounds will always have the same ratios
    - Chemical formulas: H_20, CO_2, HCL
    - Ratios: 2:1, 1:2, 1:1

Types of Matter: Mixtures



- **Mixture** is a blend of two or more substances, each of which retains its own identity and properties
  - maybe separated by physical means
    - Air, salt water, milk, brass metals
- **Heterogeneous mixture** different materials are spread out unevenly
  - Gravel
  - Vegetable Soup



- **Homogeneous mixture**
  - They have the same proportion of components throughout.
  - Homogeneous mixtures are called ***solutions***
    - Salt water
    - vinegar