Hemingway Name:_____

The Classification of Matter

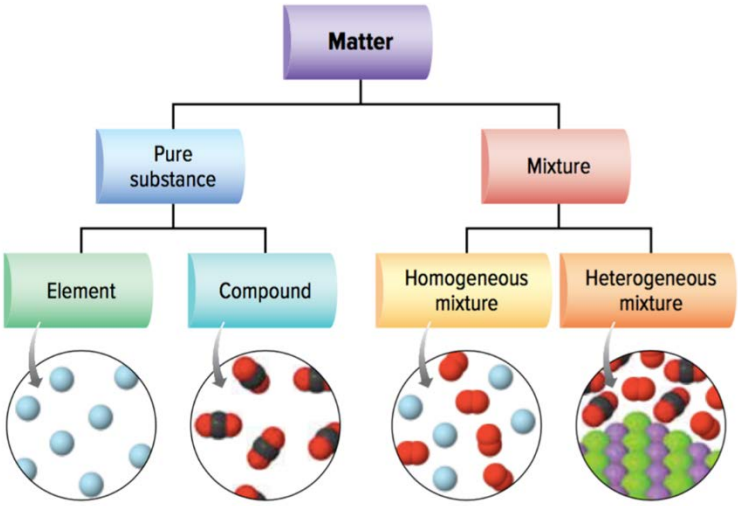
What is Chemistry?

- Chemistry is the study of _____

What is Matter?

Matter is anything that has _____ and _____

- _____ is the amount of matter in a substance or object.
  - Mass is often measured in_____ or kilograms.



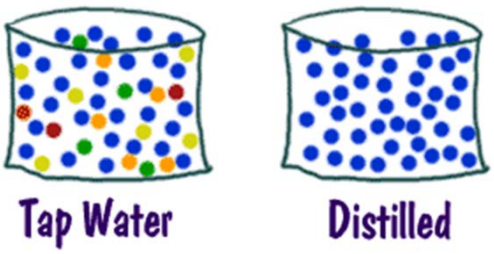
- _____ is the amount of space a substance or an object occupies.
  - Volume is often measured in _____

There are <u>two</u> types of Matter:

1. **Pure Substance**
2. **Mixture**

1. _____:
   - Is matter that contains only _____ type of particle
   - Cannot be separated by_____ means
     - Example: distilled water, pure copper wire

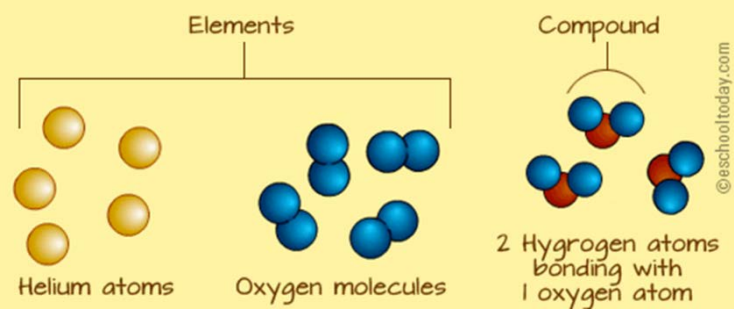
2. _____:
   - Contains _____or more pure substances.
   - _____ be separated by physical means
     - Examples: tap water, table salt dissolved in water, iron mixed with sulfur



Hemingway Name:_____

Pure Substances have two types

1. **Elements**
2. **Compounds**



Elements

- Made up of _____ type of atom; cannot be broken down into simpler substances
  - example: gold

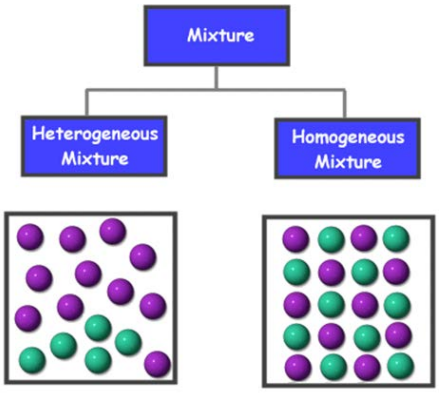
Compounds

- Made up of _____ or more elements; can be broken down into simpler substances
  - example: sodium chloride

Mixtures are formed when two or more pure substances are put_____

Mixtures – _____ types!

1. **Heterogeneous mixtures**
2. **Homogenous mixtures**



1. **Heterogeneous mixtures**
   - A mixture that is _____ uniform in its composition
   - have different components that you can _____
   - The_____ exist in large, visible clumps – they can be distinguished!
     - Example: beach sand, salad dressing, oil and water

2. **Homogenous mixtures (Solutions)**
   - A mixture that is made of substances that are _____ mixed together
   - You cannot _____ their components
     - Example:
       - air (nitrogen, oxygen, hydrogen)

- steel (iron and other elements)
- sugar in pop
- the air we breathe

Matter Tree Activity

Can you identify Pure Substances from Mixtures?

Properties

Properties = _____or how we describe something

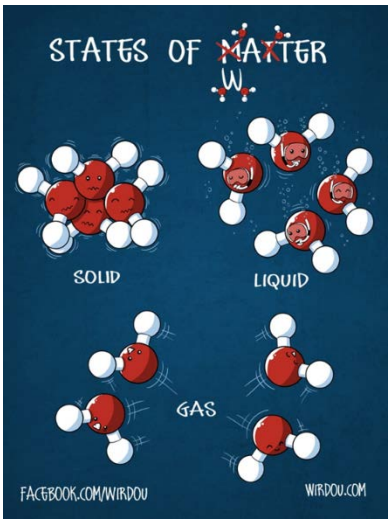
Properties of Matter

1. **Physical Properties**
2. **Chemical Properties**

Physical Properties

- Properties you can observe with your _____, measure or calculate
  - Colour, hardness, density, melting temperature etc.
  - The most common physical property used to classify things = _____

State of Matter



- Substances can exists in _____ than one state
- IMPORTANT: When it changes state it does not change into another _____
  - Example: _____
- Three states:
  - Solid, Liquid, Gas

Other Physical Properties

- _____
  - Metals that can be beaten into thin sheets are considered to be malleable

Hemingway Name:_____

- _____
  - Softer metals which can be “drawn” into wires – you can pull at opposite ends of a metal rod and it will become thinner

- _____
  - Degree in which a substance will dissolve in a given amount of another substance
- _____
  - Ability of a material to conduct electricity or heat
- _____
  - The mass per unit of volume of a substance
    - It is always constant- no matter how much of a substance you have
    - **DENSITY =**

Chemical Properties

Describes the behaviour of a substance as it _____ into a new substance

- Whether one substance will react with another substance
- Rate of reaction
- Amount of heat produced
- What proportion the substances react etc.

Common Chemical Properties

_____

- The rapid reaction of some substances with oxygen which result in the release of LOTS of energy

_____

- The slow reaction of certain metals with oxygen to form metal oxides (oxidation) - RUST

_____

- Reaction of some metals that often produces gases

- Limestone broken down by weak acid = Limestone caves

Chemical Reactions

- Chemical reaction
  - one or more pure substances _____to form a different substance or substances
- Elements can _____ to form compounds
- Compounds and elements can react to form _____ compounds
- Compounds can _____ to form elements and simpler compounds

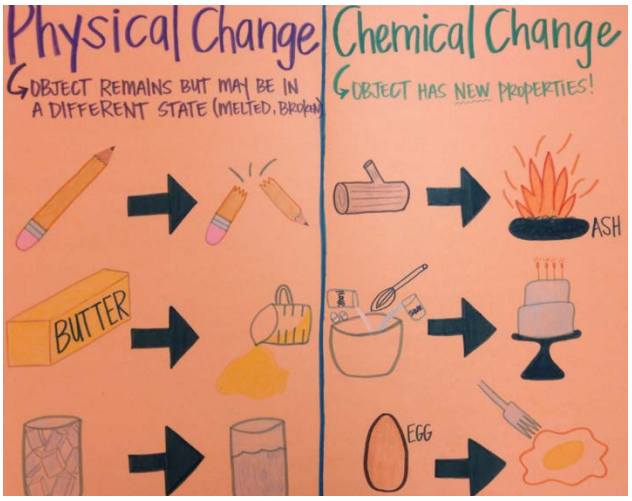
Table 2.1 Physical and Chemical Properties

Physical Properties		Chemical Properties
• colour • malleability • texture • viscosity • ability to conduct heat and electricity	• state of matter • melting point • boiling point • hardness • solubility	• combustibility • reactivity with acids • reactivity with oxygen • lack of reactivity

Chemical or Physical Change?

Chemical Change Check List:

1. The change is_____ – you can't go back
2. A _____substance forms
3. New _____ are observed
4. An _____ change may occur like heat or light given off or absorbed



Practice

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Physical and Chemical change handout