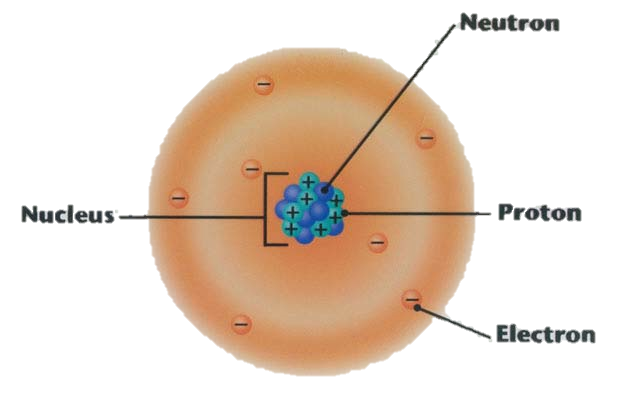
Classifying Matter

* \_\_\_\_\_\_\_\_\_\_\_: is anything that has mass and volume.
* \_\_\_\_\_\_\_\_\_\_: the amount of space that something takes up
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a material that can be used in its identification
* e.g.\_\_\_\_\_\_\_\_\_\_\_,texture, \_\_\_\_\_\_\_\_\_\_\_\_\_\_, density, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, melting point etc.

**Give all properties you can think of for water.**

* All \_\_\_\_\_\_\_\_\_\_\_is composed of \_\_\_\_\_\_\_\_\_. Atoms are the smallest complete building block of matter
* Atoms are composed of sub-atomic particles called \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_, and\_\_\_\_\_\_\_\_\_\_\_\_\_\_.



Protons are positively charged (+) and are located in the nucleus.

Neutrons have no charge (neutral) and are located in the nucleus.

Electrons are negatively charged (-) and are located outside orbiting the nucleus.

Write down some examples of different atoms that you know.

Pure Substances

* A pure substance is something which is composed of only \_\_\_\_\_\_\_\_\_\_\_\_of particle.
* Particle: an \_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_

Example:

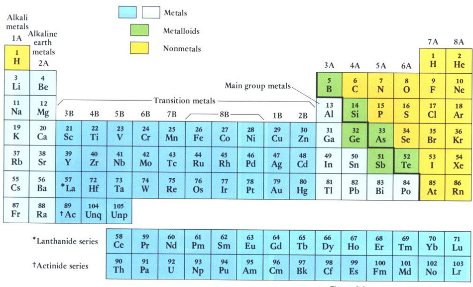
The Classification of Matter

Elements:

A pure substance that cannot be changed into anything simpler

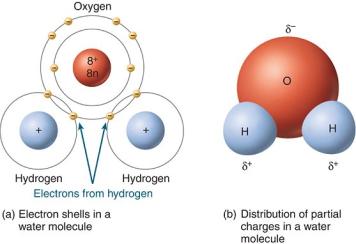
eg.

* When atoms of only \_\_\_\_\_\_kind are grouped together you have an \_\_\_\_\_\_\_\_. Elements are listed on the periodic table. There are just over \_\_\_\_\_\_\_\_ different elements in the universe.



Compounds

* \_\_\_\_\_\_\_\_\_\_\_\_\_ that consist of \_\_\_\_\_\_\_\_\_ or more different types of atoms \_\_\_\_\_\_\_\_\_\_\_\_\_bonded together to make one type of \_\_\_\_\_\_\_\_\_\_\_\_\_.



Example: Water H20

* Made of \_\_\_\_\_\_\_\_\_\_atoms and \_\_\_\_\_\_\_\_\_\_\_\_ atoms but the only molecule is H2O
* Only **one type** of atom

e.g. Mg

* two or more types of

atoms but only **one type**

of molecule

e.g. H2O

**Mixtures**

* + Contain \_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_ pure substances
  + Eg. salt dissolved in water

Kool Aid is a mixture because it’s made up of water molecules, sugar molecules, and food colouring molecules

**Homogeneous Mixtures:**

Made up of substances that are evenly and microscopically mixed together

These are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (look like one thing).

*Salt water* ( \_\_\_\_\_\_\_\_\_\_\_\_\_Solution)

made of salt molecules and water molecules

*Steel* ( \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Solution)

made of iron atoms, nickel atoms, chromium atoms, carbon atoms

*Air* ( \_\_\_\_\_\_\_\_\_\_\_\_ solution)

made up of many different types of atoms and molecules such Oxygen, Carbon Dioxide and Nitrogen.

**Heterogeneous** **Mixtures:**

* + A mixture that is **not uniform** in its composition
  + A \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a liquid and solid that doesn’t mix like flour and water
  + A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_are medium sized particles that don’t settle like fog or milk.
  + A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **mixture** is a mixture of solids that can be seen. eg.salad

Physical and Chemical Changes

In a physical change no new substances are formed

Physical changes include changes of state.

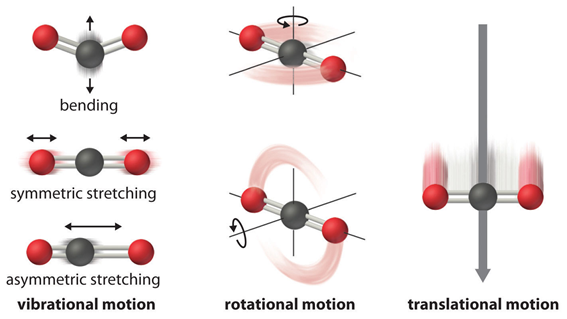
* liquid to solid: \_\_\_\_\_\_\_\_\_\_\_\_\_ or Freezing
* solid to liquid: \_\_\_\_\_\_\_\_\_\_\_\_\_

liquid to gas: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or Boiling

* gas to liquid: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* gas to solid:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* solid to gas: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Kinetic Molecular Theory

* 1. All matter is made up of tiny particles.
  2. Different substances have different particles.
  3. The particles are in constant \_\_\_\_\_\_\_\_\_\_\_\_.
  4. The more \_\_\_\_\_\_\_\_\_\_ the particles have, the faster they \_\_\_\_\_\_\_\_\_\_\_\_\_.
  5. The attraction between particles \_\_\_\_\_\_\_\_\_\_\_\_\_ with distance.



Chemical change results in a \_\_\_\_\_\_\_ substance being produced with \_\_\_\_\_\_\_\_\_\_ chemical and physical \_\_\_\_\_\_\_\_\_\_.

In short, a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_takes place. e.g. frying an egg, burning

Clues that a Chemical Reaction Might Have Occurred:

* + - * \_\_\_\_\_\_\_\_\_\_\_\_ change
      * \_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_ given off
      * \_\_\_\_\_\_\_\_\_\_\_\_ given off
      * \_\_\_\_\_\_\_\_\_\_ released
      * \_\_\_\_\_\_\_\_\_\_\_\_ forming in a liquid
      * Difficult to \_\_\_\_\_\_\_\_\_\_
* **Identifying Chemical and Physical Change**

|  |  |  |
| --- | --- | --- |
|  | **Physical** | **Chemical** |
| **Reversible** |  |  |
| **New substance** |  |  |
| **Properties** |  |  |
| **Energy change** |  |  |

Chemical vs Physical Properties

Physical Properties describe a substances

* physical state - solid, liquid or gas
* appearance – \_\_\_\_\_\_\_\_\_\_\_\_\_\_ , texture, smell
* density, melting and boiling points

Chemical Properties describe a substances’ behavior in a reaction.

Example = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, poisonous, highly reactive, corrosive,

**Observations of matter**

Qualitative vs Quantitative

A chemical \_\_\_\_\_\_\_\_\_\_\_ means that a chemical \_\_\_\_\_\_\_\_\_\_ has occurred.

In a chemical reaction one or more substances (\_\_\_\_\_\_\_\_\_\_\_) change to one or more new substances (\_\_\_\_\_\_\_\_\_\_\_\_)

Energy is either released OR absorbed in every chemical reaction.

2 H2 + O2 🡪 2 H2O

\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_

Practice – write the word equation

Aluminum reacts with oxygen to form aluminum oxide

In our bodies we use glucose and oxygen to produce carbon dioxide, water and ATP.

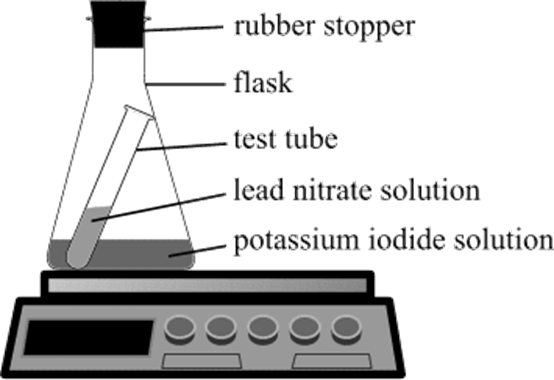
Two Types of Chemical Reactions You Know About

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: metal reacting with oxygen and water to form rust.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: is the burning of a substance (fuel) in the presence of oxygen. Products are carbon dioxide and water.

* In a chemical reaction atoms rearrange to form new substances.
* HCl + NaHCO3 → H2O + CO2 + NaCl
* the total \_\_\_\_\_\_\_\_\_of the reactants is equal to the total mass of the \_\_\_\_\_\_\_\_\_\_\_\_ because no atoms are created or destroyed…only rearranged!
* This is the *Law of* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ *of Mass.*

A closed system (a sealed container) is needed to prove the Law of Conservation of Mass!

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**Endothermic vs Exothermic Reactions**

All reactions either give off energy or absorb energy.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_reactions absorb energy and the surroundings can get cooler.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reactions release energy the surroundings get warmer like in combustion and burning.