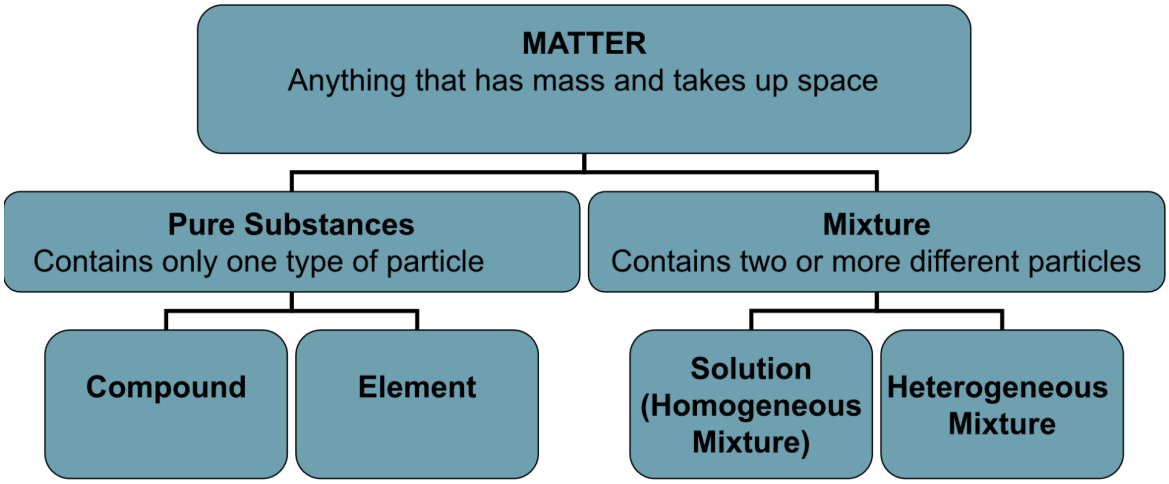
# CHEMISTRY REVIEW

# Matter Flow Chart




**Element** – a pure substance that cannot be broken down into a simpler substance. For example Au, C, O, Na.
**Compound** – a pure substance that contains two or more elements. For example $H_2O$.
**Solution (Homogenous Mixture)** – a uniform mixture of two or more substances. For example Kool-aid.
**Heterogeneous mixture** – a mixture in which two or more substances are distinguishable from each other.

# Properties of Matter

- **Physical Property**

A characteristic or description of a substance. For example, state, hardness, malleability, ductility, melting/boiling point, colour, crystal form, solubility and viscosity, are all physical properties.

- **Chemical Property**

Describes the behaviour of a substance as it becomes a new substance. Combustility and reaction with acid are both chemical properties.

# Changes of Matter

- **Physical Change**

A change in state or form of a substance that does not change the original substance. Cutting sodium or melting ice are both physical changes.

- **Chemical Change**

The alteration of a substance into one or more different substances with different properties. Rusting and burning are chemical changes.

# Indicators of a Chemical Change

1. Colour Change
2. Gas produced (bubbles)
3. Heat and/or light produced
4. Precipitate formed (solid from two liquids)
5. Difficult to reverse

Throughout history, scientists have tried to develop an explanation for the observations they made. Two theories that were developed were the Particle Theory of Matter, and the Atomic Theory

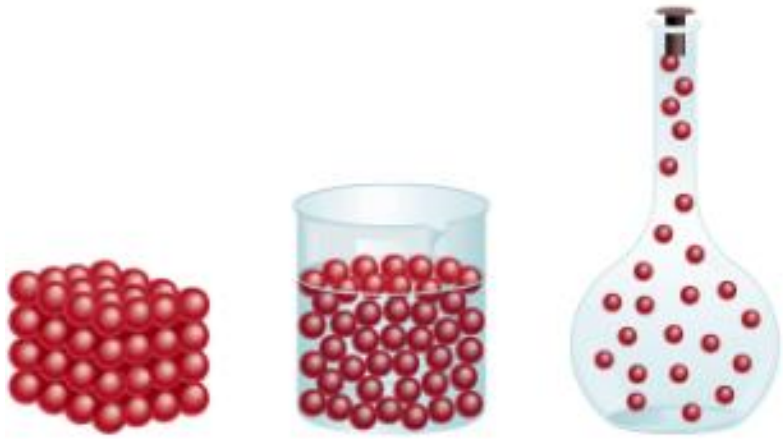
We will be looking at the Particle Theory in the first half of our review. We will then study the atomic theory

# The Particle Theory of Matter

Recall:
Matter is anything that has mass and takes up space.
Matter can also be found in three different states – solid, liquid, and gas.
The particle theory of matter can be used to explain the properties of solids, liquids, and gases as well as changes of state.
The postulates of the particle theory are as follows:

1. All matter is made up of tiny particles (atoms, ions, molecules)
2. All particles of one substance are the same. Different substances are made of different particles.
3. The spaces between the particles are large compared to the sizes of the particles themselves.
4. The particles are always moving. The more energy that particles have, the faster they move.
5. There are attracting forces among the particles. These forces are stronger when the particles are closer together.

- The particle theory of matter can be used to explain the properties of solids, liquids, and gases as well as changes of state.



The particle theory is useful for explaining physical changes such as changes of state. To explain chemical changes a different theory was needed and the atomic theory was developed.

# References


- Zumdal, S. *Chemistry 3rd Edition*. D.C. Health and Company, Lexington, MA. 1993
- http://www.clickandlearn.org/Gr9_Sci/Particle_Theory.htm
- http://www.slideshare.net/shafie_sofian/kinetic-model-of-matter-81877
- Boban, R. *SCH 3U Course Notes*. Thunder Bay, 2006