

Unit 2: Classification of Matter

Key Terms:

- ✓ Matter - *anything that has mass and volume*
- ✓ Mass - *the amount of matter in an object (measured in kilograms)*
- ✓ Weight - *the force exerted upon a mass by gravity*
- ✓ Physical Property - *a quality that can be observed or measured without changing the identity of the substance*
- ✓ Chemical Property - *a quality that can only be observed or measured during a chemical change*
- ✓ Intensive Property - *any property that does not depend on the quantity of the substance*
- ✓ Extensive Property - *any property whose value depends on the quantity of the substance*
- ✓ Homogenous - *having the appearance of a pure substance (uniform composition)*
- ✓ Heterogeneous - *having visibly distinguishable components*
- ✓ Distillation - *separating a mixture based on differences in boiling points*
- ✓ Filtration - *separating a mixture by interposing a medium through which only the fluid can pass*
- ✓ Centrifugation - *separating a mixture based on differences in density using a rapidly spinning container*

States of Matter:

- ✓ Solid - a substance with a defined shape (rigid) and defined volume (noncompressible)
 - The particles in a solid are closely packed. All are in motion, but there is no motion relative to other particles
- ✓ Liquid - a substance with an undefined shape (fluid) and a defined volume (noncompressible)
 - The particles in a liquid are closely packed. All are in motion, and the temperature is high enough that the particles are able to move relative to each other
- ✓ Gas - a substance with an undefined shape (fluid) and an undefined volume (compressible)
 - The particles in a liquid are widely dispersed. All are in motion and there is little interaction between particles

Pure Substance:

A substance with one component. It cannot be separated into simpler substances by physical processes.

- ✓ Element - a chemical substance made of only one type of atom. There are 92 naturally occurring elements, and around 25 that have been synthetically produced in a laboratory
- ✓ Compound - two or more elements bonded together in a fixed ratio.

Mixture:

Multiple substances combined together that can be separated by physical processes. Mixtures do not have a fixed composition.

- ✓ Solution - A solute dissolved in a solvent, forming a homogenous mixture. The solution will have the same physical state as the solvent. Solutions cannot be separated by filtration or centrifugation, but distillation (evaporation) is successful.
- ✓ Suspension - A heterogeneous fluid mixture in which the particles are large enough to settle over time if left undisturbed. Suspensions can be separated by filtration.
- ✓ Colloid - A mixture with one substance microscopically dispersed through another substance. Colloids are microscopically heterogeneous, but appear homogenous to the naked eye. Colloids display the Tyndall Effect, shown as the scattering of a light beam directed through the mixture. Colloids cannot be separated by filtration, but some separation can be achieved by centrifugation.

Signs of a Chemical Change:

- ✓ Formation of a precipitate
- ✓ Evolution of a gas
- ✓ Change in temperature
- ✓ Production of light
- ✓ Drastic color change