Methods of Separating Components of Mixtures
Separation Techniques

• The separation of mixtures may be done to enhance the purity of substances

• Accomplished using different characteristic properties, such as density, boiling point, melting point, solubility, etc
Some Types of Separation Techniques

- filtration
- mechanical separation
- floatation
- centrifugation
- simple distillation
- fractional distillation
- crystallization
- chromatography
Filtration

• Technique used to separate mixtures of an insoluble solid and a liquid.
Examples of Mixtures You Can Separate Using Filtration

• Sand and water
• Broken glass and water
Mechanical Separation

- Physical separation methods that involve the use of tools such as forceps and sieves, to separate the components of a mixture.
- Ex. Gravel and sand
Flotation

Separation method in which some solids of a suspension mixture are allowed to settle and the less dense material is poured off.

Ex. Panning of gold
Centrifugation

- Speeds up the separation of a solid from a liquid through the centripetal force developed during the rotation of the centrifuge.
Distillation

- This is the separation technique where two *miscible liquids* (liquids that mix together) are separated.
- It is made possible due to the fact that each liquid has its unique *boiling point*. 
Types of Distillation

- Simple distillation
- Fractional distillation
Simple Distillation

• This is a technique used to separate a mixture of a soluble substance and a solvent.

• E.g salt and water
Fractional distillation

• This is the technique used to separate a mixture of two miscible liquids with different boiling points.
• E.g. water and ethanol
• The boiling point for water is 100 while for ethanol it is 78.
Fractional Distillation Demonstration
Fractional Crystallization

• **Crystallization** is the process in which crystals are formed.

• Fractional crystallization is done by lowering of temperature of a mixture or solution so that the more insoluble component crystallizes out first. (Uses solubility to separate substances)
Chromatography

- Is the separation technique used to separate soluble substances using a media and a solvent.
- It is mostly applied in identifying mixtures that are colored or pigments.
Some Types of Chromatography

- Radial chromatography
- Ascending chromatography
Radial Chromatography

• In this type of chromatography, as the pigment separates, the different colors move outwards.
Radial Chromatogram

Yellow 5
Blue 1 / Yellow 5
Red 40
Red 3

Red 40
Blue 1

Blue 1 / Yellow 5

NOTE: This paper cannot separate Blue from Yellow, so that they appear GREEN
Ascending Chromatography

- The solvent moves upwards on the separating media