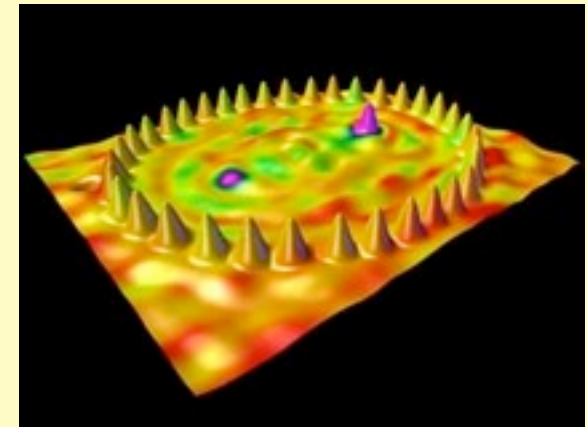
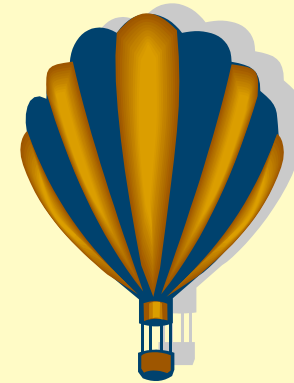


Chapter 2 - Matter Vocabulary Review

- 2.1 The Particulate Nature of Matter
- 2.2 Elements and Compound
- 2.3 The States of Matter
- 2.4 Physical and Chemical properties and
Changes
- 2.5 Mixtures and Pure Substances
- 2.6 Separation of Mixtures

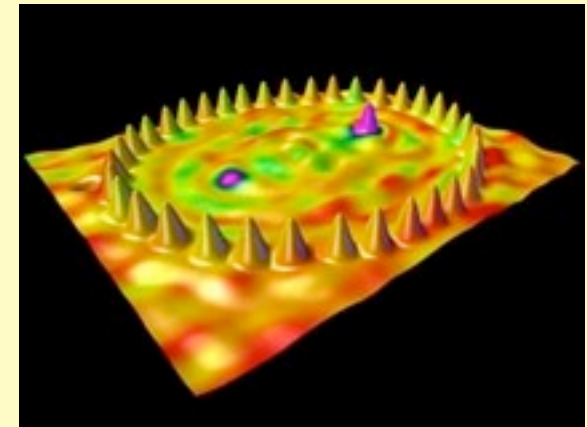
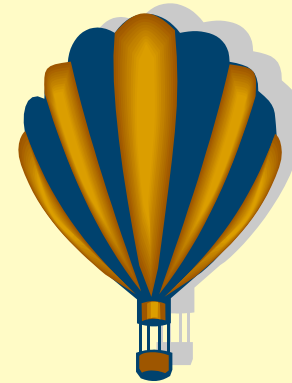
2.1 The Sub- Microscopic nature of Matter

- _____ is the ‘stuff’ that everything is made of.
- It’s basically anything that has _____ (heft) and _____ (take up space)
- Matter comes in many different variations giving the world tremendous _____.
- Although the particles within matter cannot be seen because of their extremely small size, a device called a _____ (_____) allows reflective images of the particles to be “seen.”



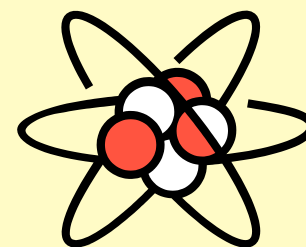
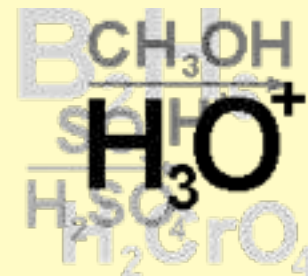
2.1 The Sub- Microscopic nature of Matter

- **Matter** is the ‘stuff’ that everything is made of.
- It’s basically anything that has **mass** (heft) and **volume** (take up space)
- Matter comes in many different variations giving the world tremendous **diversity**.
- Although the particles within matter cannot be seen because of their extremely small size, a device called a **scanning tunneling microscope (STM)** allows reflective images of the particles to be “seen.”



2.2 Matter, Elements and Compounds

- Matter as a substance can be classified in many different ways.
- Simple _____ forms of matter are called _____ or _____
- _____ are the simplest forms of pure matter, composed of incredibly small particles called _____ or simple _____.
 - ✓ 7 elements are made of diatomic molecules: _____
- There are approximately ____ known elements, each having its own unique characteristic atom.
- These elements are arranged on a

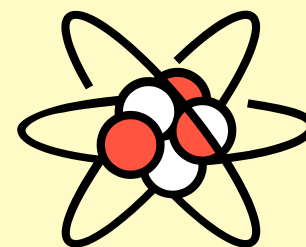
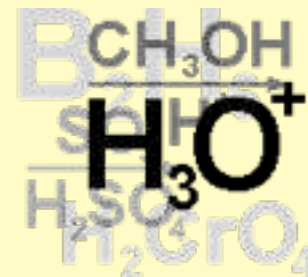


Periodic Table of the Elements

A periodic table of elements with various elements highlighted in different colors.

2.2 Matter, Elements and Compounds

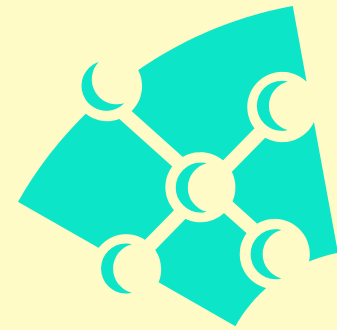
- Matter as a substance can be classified in many different ways.
- Simple **pure** forms of matter are called **elements** or **compounds**
- **Elements** are the simplest forms of pure matter, composed of incredibly small particles called **atoms** or simple **molecules**.
 - ✓ 7 elements are made of diatomic molecules: **Br₂ I₂ N₂ Cl₂ H₂ O₂ F₂**
- There are approximately **110** known elements, each having its own unique characteristic atom.
- These elements are arranged on a



Periodic Table of the Elements

A periodic table of elements with various groups highlighted in different colors.

- _____ are more complex forms of pure matter, composed of incredibly small particles called _____.



- In spite of only approximately 100 different _____, there are a “gazillion” different _____ found in nature or made in the lab.

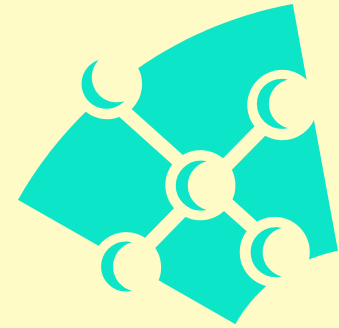
✓ just as there are only 26 _____, but consider how many different _____ can be formed.



- The _____ of different _____ chemically join to become the _____ of _____.



- **Compounds** are more complex forms of pure matter, composed of incredibly small particles called **molecules**.



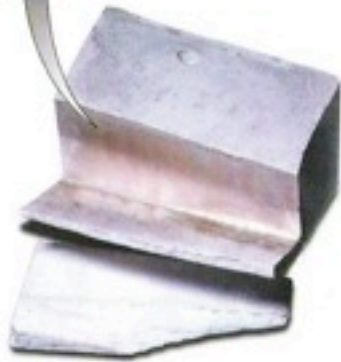
- In spite of only approximately 100 different **elements**, there are a “gazillion” different **compounds** found in nature or made in the lab.
 - ✓ just as there are only 26 **letters**, but consider how many different **words** can be formed.



- The **atoms** of different **elements** chemically join to become the **molecules** of **compounds**.



The properties and particles of two _____ are very different than the properties and particles of the _____ that they form.



Sodium metal



+

chlorine gas



react to form



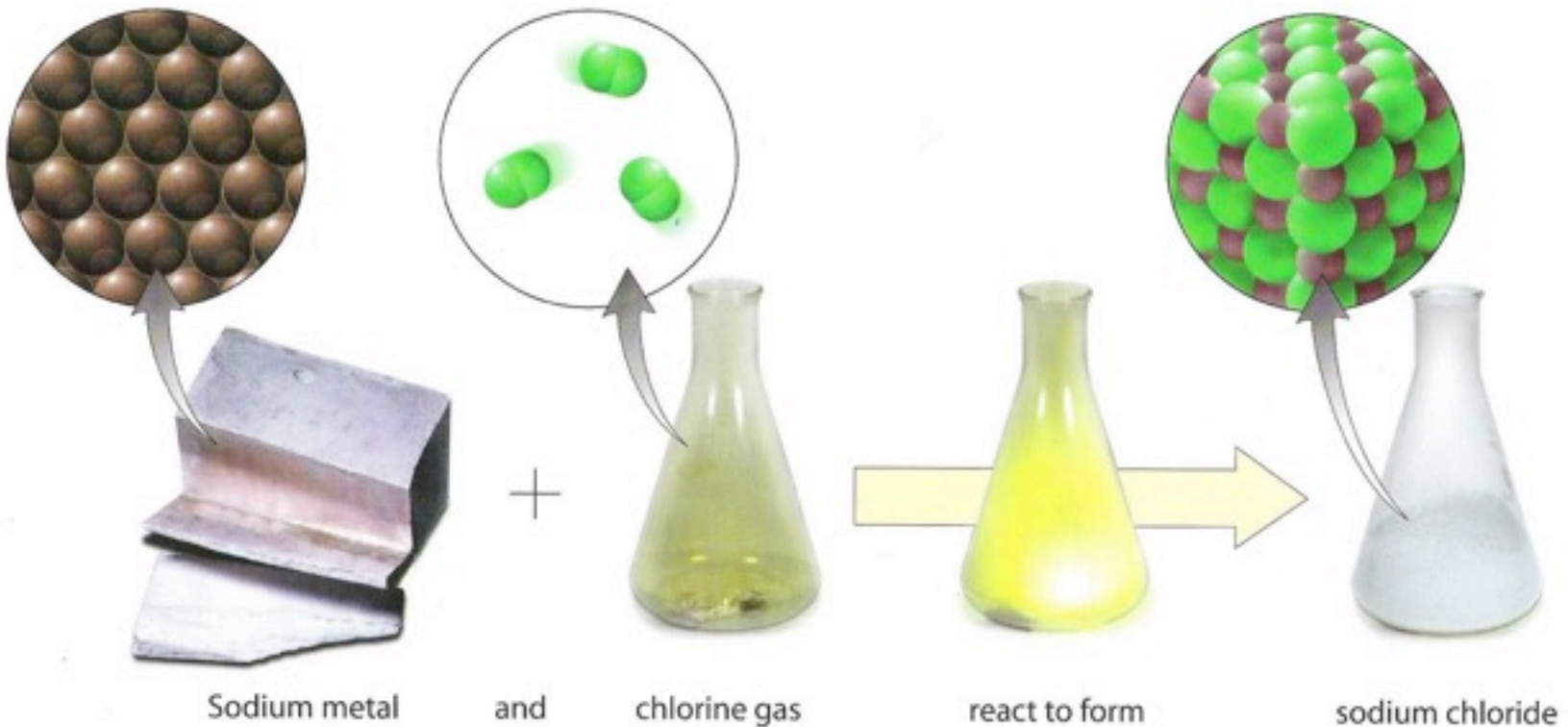
sodium chloride

shiny
conducts electricity

yellow-green
poisonous gas

harmless crystalline
solid white crystalline

The properties and particles of two **elements** are very different than the properties and particles of the **compound** that they form.



shiny
conducts electricity

yellow-green
poisonous gas

harmless crystalline
solid white crystalline

- Compounds are formed from the elements, however, once the atoms “bond” and become molecules, the properties and characteristics of the compound are _____ to the new substance that they have formed.



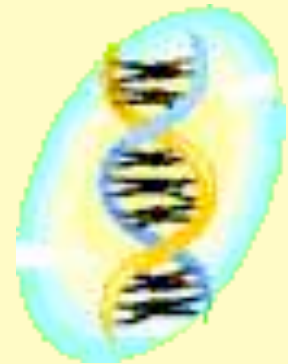
- The atoms that the compounds are made of are arranged in a particular pattern and are made in _____ of one type of atoms the other type of atoms.



- Compounds are formed from the elements, however, once the atoms “bond” and become molecules, the properties and characteristics of the compound are **unique** to the new substance that they have formed.

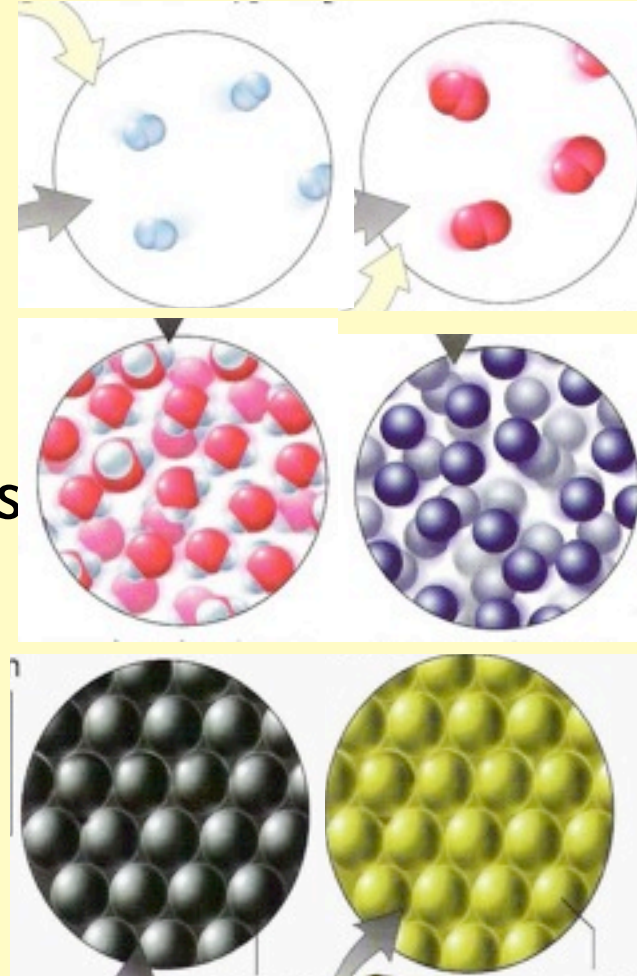


- The atoms that the compounds are made of are arranged in a particular pattern and are made in **specific ratios** of one type of atoms the other type of atoms.



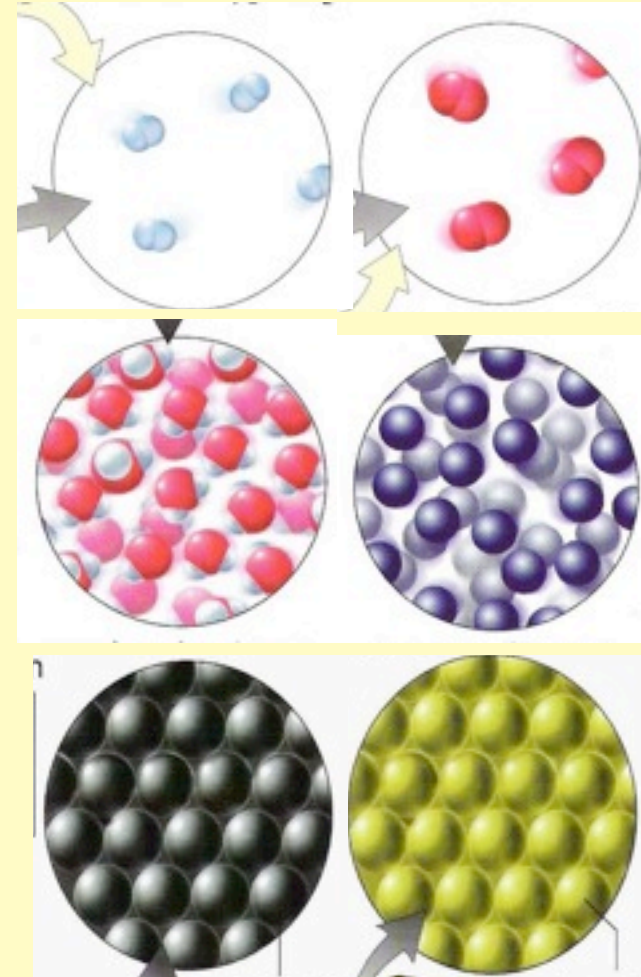
2.3 What are the States of Matter?

- Matter may exist as three possible forms aka: phases or states.
- - no definite shape or definite volume. (and) Particles exhibit a random “zooming” motion throughout a given space.
- - no definite shape, but definite volume. (but) Particles exhibit a “rolling” overlap motion within a given space.
- - definite fixed shape and volume. (and) The particles exhibit a “vibration” like motion at a fixed location.



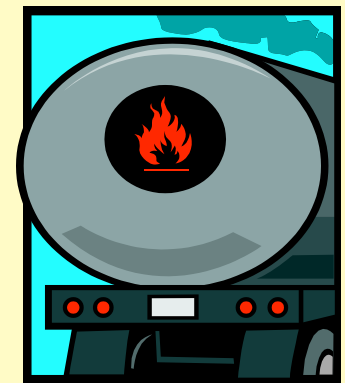
2.3 What are the States of Matter?

- Matter may exist as three possible forms aka: phases or states.
- **Gas** -no definite shape or definite volume. (**fluid** and **compressible**)
Particles exhibit a random “zooming” motion throughout a given space.
- **Liquid** - no definite shape, but definite volume. (**fluid** but **incompressible**)
Particles exhibit a “rolling” overlap motion within a given space.
- **Solid** - definite fixed shape and volume. (**rigid** and **incompressible**) The particles exhibit a “vibration” like motion at a fixed location.



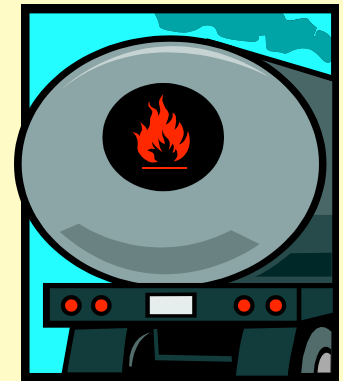
2.4 Physical, Chemical Changes and Properties

- Physical properties are physical traits that can be observed without changing the material. Characteristics like color, odor, texture, density, boiling point, melting point, solubility, luster or hardness.
- Chemical properties are reactive traits that always produce new substances. Characteristics like flammability, reactivity, toxicity, and stability.



2.4 Physical, Chemical Changes and Properties

- **Physical** properties are physical traits that can be observed without changing the material. Characteristics like **color**, **temperature**, **shape**, **odor**, **state**, **density**, **solubility**, **conductivity**, **melting or freezing points**.
- **Chemical** properties are reactive traits that always produce new substances. Characteristics like **flammability**, **corrosiveness**, **toxicity**, and **reactivity**.



- properties are characteristics that are *independent* of the amount of matter present.

- ✓ Chemical properties are always intensive.
- ✓ Some intensive physical properties are , , , and points.



- properties are characteristics that are *dependent* upon the amount of matter present.

- ✓ Some examples of extensive traits are , and .



- **Intensive** properties are characteristics that are *independent* of the amount of matter present.

- ✓ Chemical properties are always intensive.
- ✓ Some intensive physical properties are **temperature**, **color**, **density**, **melting** and **freezing** points.



- **Extensive** properties are characteristics that are *dependent* upon the amount of matter present.

- ✓ Some examples of extensive traits are **mass**, **length** and **volume**.



- _____ changes are changes in _____ only.

- During these changes _____ substances are produced, although appearance of the material changes.

- Changes in _____, _____, _____, or the process of _____ are all physical changes.



- _____ changes are changes not only in appearance, but _____ as well.

- In these cases _____ substances are produced and therefore many of its physical properties change.

- Signals of this change may include the formation of a _____ solid, liquid, or gas, absorption or release of _____, and changes in appearance.

- **Physical** changes are changes in **appearance** only.
- During these changes **no new** substances are produced, although appearance of the material changes.
- Changes in **size**, **shape**, **phase**, or the process of **dissolving** are all physical changes.
- **Chemical** changes are changes not only in appearance, but **identity** as well.
- In these cases **new** substances are produced and therefore many of its physical properties change.
- Signals of this change may include the formation of a **new** solid, liquid, or gas, absorption or release of **energy**, and changes in appearance.

Verbs that indicate change

-
- burn
 - explode
 - combust
 - react
 - rust
 - corrode
 - tarnish
 - oxidize
- freeze
 - melt
 - boil
 - condense
 - sublime
 - dissolve
 - crystallize
(undissolve)

Verbs that indicate change

Chemical Physical

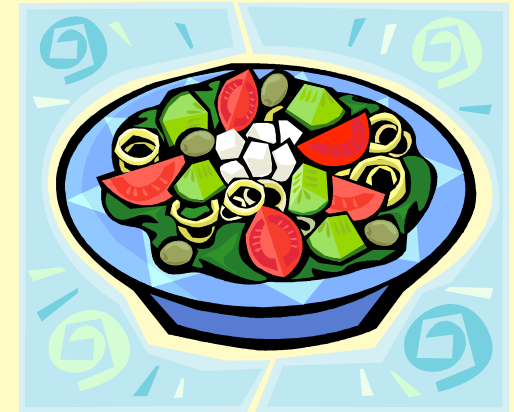
- burn
- explode
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- react
- rust
- corrode
- tarnish
- oxidize
- freeze
- melt
- boil
- condense
- sublime
- dissolve
- crystallize
(undissolve)

2.5 Mixtures

- The elements and compounds in the world are very rarely found within nature as _____ forms of matter, and are instead mixtures of these substance.



- A _____ is a form of matter that is made by physically mixing two or more substances together. The quantities of the components of a mixture can be _____.



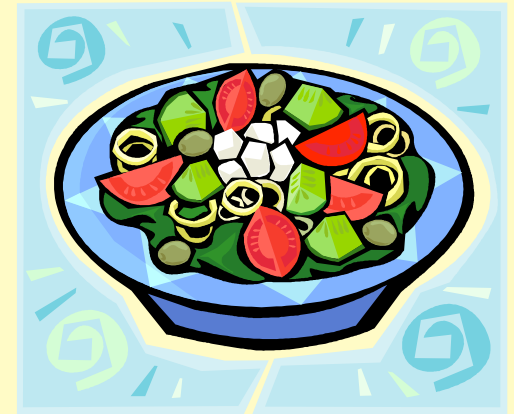
- Mixtures are combinations of elements and/or compounds and are classified as _____ substances.

2.5 Mixtures

- The elements and compounds in the world are very rarely found within nature as **pure** forms of matter, and are instead mixtures of these substance.

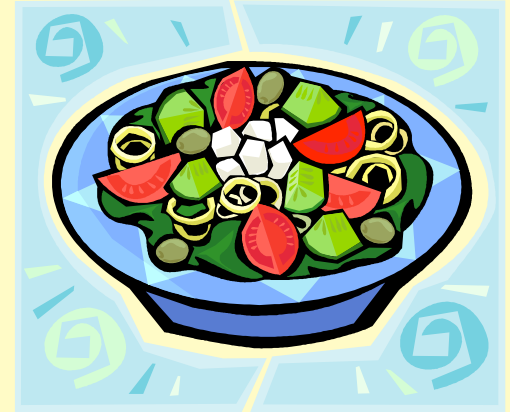


- A **mixture** is a form of matter that is made by physically mixing two or more substances together. The quantities of the components of a mixture can be **varied**.

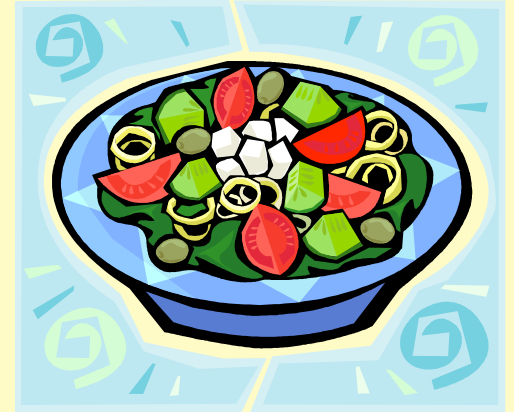


- Mixtures are combinations of elements and/or compounds and are classified as **impure** substances.

- There are basic classifications we use for a mixture:
- Mixtures that are have visibly different parts within the mixture.
- Mixtures that are , do not contain visibly distinct parts, and are called .



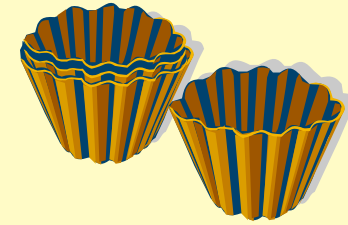
- There are **two** basic classifications we use for a mixture:
- Mixtures that are **heterogeneous** have visibly different parts within the mixture.
- Mixtures that are **homogeneous**, do not contain visibly distinct parts, and are called **solutions**.



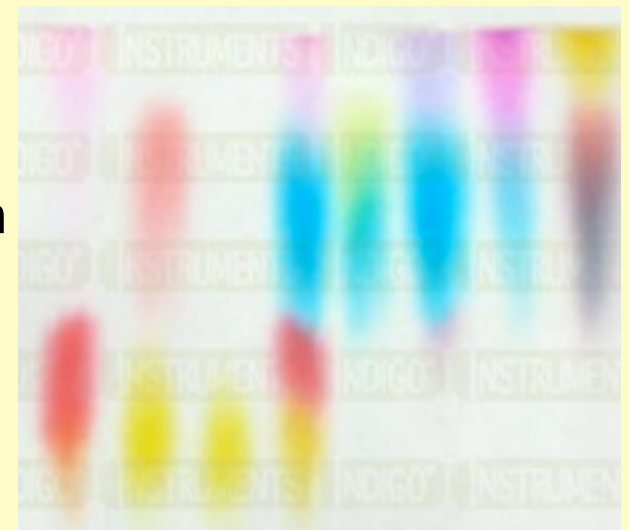
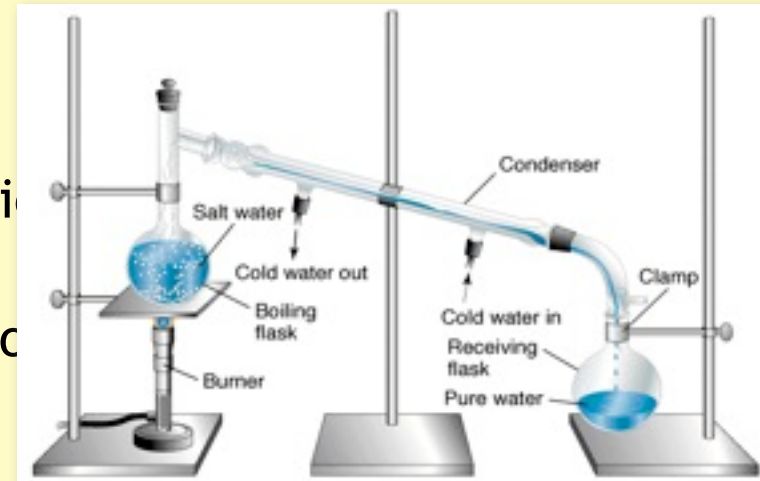
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2.6 Methods of separating Mixtures

- Many mixtures require sophisticated methods of separation, however, all are _____, not chemical, processes.

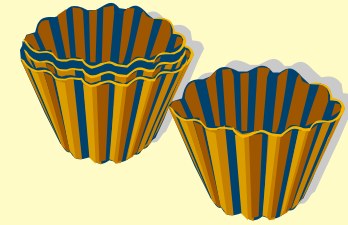


- ✓ _____ is an option, which are separations based on physical properties like size or density.
- ✓ _____, in which one part of a solution is evaporated and then condensed, leaving the other part of the solution behind. Distillation is particularly useful for separating two _____ with different boiling temperatures.
- ✓ _____, which is a modified filtration process for solutions of particulate mixtures.



2.6 Methods of separating Mixtures

- Many mixtures require sophisticated methods of separation, however, all are **physical**, not chemical, processes.



- ✓ **Filtration** is an option, which are separations based on physical properties like size or density.
- ✓ **Distillation**, in which one part of a solution is evaporated and then condensed, leaving the other part of the solution behind. Distillation is particularly useful for separating two **liquids** with different boiling temperatures.
- ✓ **Chromatography**, which is a modified filtration process for solutions of particulate mixtures.

