

Matter

Properties & Changes

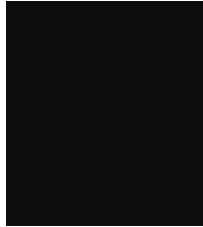
Properties of Matter Substances

- _____ – anything that has mass and takes up space
- _____ - matter that has a uniform and unchanging composition...also known as a pure substance



Physical Properties of Matter

- A _____ **property** is a characteristic that can be observed or measured without _____ the sample's composition.



Physical Properties Movie

Examples of Physical Properties

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Extensive and Intensive Properties

- _____ **properties** are dependent upon the _____ of substance present
- Examples:
 - _____
 - _____
 - _____

Extensive and Intensive Properties

- _____ **properties** are _____ of the amount of substance present
- Examples:
 - _____
 - _____
 - _____

Chemical Properties of Matter

- The ability of a substance to combine with or change into one or more other substances is called a _____ **property**.
- Similarly, the inability of a substance to change into another substance is also a chemical property.

Physical Changes

- Changes which alter a substance without changing its composition, are known as _____ **changes**.
- Examples:
 - _____
 - _____
 - _____

Physical Changes

- Phase changes are another example of physical changes
- When you encounter terms such as _____, _____, _____, or _____, the meaning generally refers to a phase change in matter.

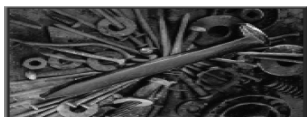


Chemical Changes

- A process that involves one or more substances changing into new substances is called a _____ **change**, which is commonly referred to as a _____.
- The new substances formed in the reaction have different compositions and different properties from the substances present before the reaction occurred.

Chemical Changes

- When a freshly exposed iron surface is left in contact with air, it slowly changes into a new substance, namely, the rust.
- The iron reacts with oxygen in the air to form a new substance, rust.



Chemical Changes

- When you encounter terms such as _____, _____, _____, _____, _____, or _____, the meaning generally refers to a chemical reaction.

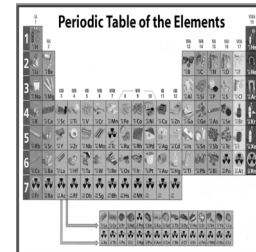
Elements, Compounds, & Mixtures

- An _____ is a pure substance that cannot be separated into simpler substances by physical or chemical means.
- Each element has a unique chemical name and symbol.
- The chemical symbol consists of one, two, or three letters; the first letter is always capitalized and the remaining letter(s) are always lowercase.

Elements

- Elements take up one block on the periodic table

Element	Chlorine	State of Matter
Atomic Number	17	
Symbol	Cl	
Atomic Mass	35.453	



A standard periodic table of elements with element symbols and names.

Compounds

- A _____ is a combination of two or more different elements that are combined chemically.
- _____, _____, _____, and _____ are examples of common compounds.
- Unlike elements, compounds can be broken down into simpler substances by _____ means.

Compounds

- The chemical symbols of the periodic table make it easy to write the formulas for chemical compounds.
- For example, table salt, or sodium chloride, is composed of one part sodium (Na) and one part chlorine (Cl), and its chemical formula is NaCl.

Mixtures

- A _____ is a combination of two or more pure substances in which each pure substance retains its individual chemical properties.



Types of Mixtures

- Mixtures themselves are classified as either heterogeneous or homogeneous.
- A _____ **mixture** is one that does not blend smoothly throughout and in which the individual substances remain distinct.
- The _____ mixture is an example of a heterogeneous mixture.

Types of Mixtures

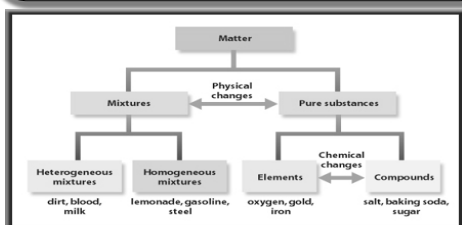
- A **mixture** has constant composition throughout; it always has a single phase.
- Homogeneous mixtures are also referred to as .
- An example of a homogeneous mixture would be .

Types of Mixtures

- An is a **homogeneous** mixture of metals, or a mixture of a metal and a nonmetal in which the metal substance is the major component.



Categories of Matter



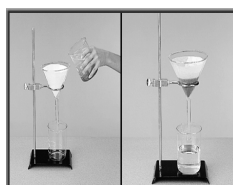
Mixtures & Compounds video clip

Separating Mixtures

- Because the substances in a mixture are physically combined, the processes used to separate a mixture are physical processes that are based on the difference in physical properties of the substances.

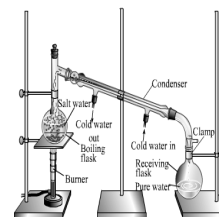
Filtration

- is a technique that uses a porous barrier to separate a solid from a liquid.
- Heterogeneous mixtures composed of solids and liquids are easily separated by filtration.



Distillation

- **Distillation** is a separation technique that is based on differences in the boiling points of the substances involved.
- Most homogeneous mixtures of 2 or more liquids can be separated by distillation



Crystallization

- **Crystallization** is a separation technique that results in the formation of pure solid particles of a substance from a solution containing the dissolved substance.



Chromatography

- **Chromatography** is a technique that separates the components of a mixture on the basis of the tendency of each to travel or be drawn across the surface of another material.
- The separation occurs because the various components of the ink spread through the paper at different rates.
- Paper Chromatography

States of Matter

- In fact, all matter that exists on Earth can be classified as one of these physical forms called **states of matter**.
- The three main states of matter are: _____, _____, & _____.
- Scientists recognize a fourth state of matter called _____, but it does not occur naturally on Earth except in the form of lightning bolts.

States of Matter



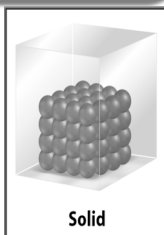
States of Matter Clip



Phase Changes Clip

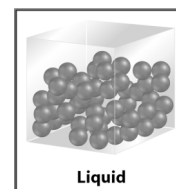
Solids

- A **solid** is a form of matter that has its own definite _____ and _____.
- The particles of matter in a solid are very tightly packed; when heated, a solid expands, but only slightly.
- Because its shape is definite, a solid may not conform to the shape of the container in which it is placed.



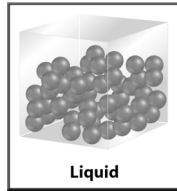
Liquids

- A **liquid** is a form of matter that _____, has _____ volume, and takes the shape of its container.
- The particles in a liquid are not rigidly held in place and are less closely packed than are the particles in a solid: liquid particles are able to move past each other.



Liquids

- This allows a liquid to flow and take the shape of its container, although it may not completely fill the container.
- Because of the way the particles of a liquid are packed, liquids are virtually incompressible. Like solids, liquids tend to expand when heated.

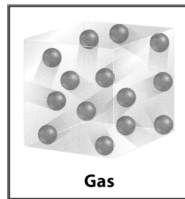


Gases

- A **gas** is a form of matter that flows to conform to the shape of its container and fills the entire volume of its container.
- Compared to solids and liquids, the particles of gases are _____.
- Because of the significant amount of space between particles, gases are easily _____.

Gases

- The word _____ refers to the gaseous state of a substance that is a solid or a liquid at room temperature.
- For example, steam is a vapor because at room temperature water exists as a liquid.



Changes in State

- Increasing or decreasing the amount of kinetic energy will cause changes in the state of matter
- Changes of State