

Section 2.1

The Nature of Matter

Objectives

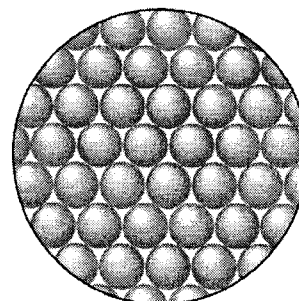
1. To learn about the composition of matter
2. To learn the difference between elements and compounds
3. To define the three states of matter

Section 2.1

The Nature of Matter

A. The Particulate Nature of Matter

- Matter has mass and occupies space.
- It is composed of tiny particles called atoms.



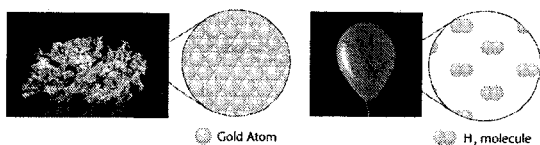
Section 2.1

The Nature of Matter

B. Elements and Compounds

Elements

- Elements contain only one type of atom – elemental copper contains only copper atoms and elemental gold contains only gold atoms.



Section 2.1

The Nature of Matter

B. Elements and Compounds

Compounds

- Compounds are substances that contain two or more different types of atoms.

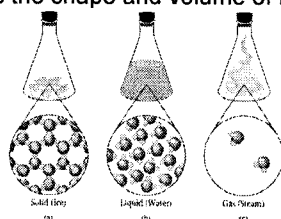
Atom Combinations	Name	Characteristics
	carbon monoxide	Carbon monoxide is a poisonous gas.
	carbon dioxide	You breathe out carbon dioxide as a waste material, and plants use carbon dioxide to make oxygen.
	water	Water is the most important liquid on Earth.
	hydrogen peroxide	Hydrogen peroxide is used to disinfect cuts and bleach hair.

Section 2.1

The Nature of Matter

C. The States of Matter

- Matter exists in three states:
  - Solid: a rigid substance with a definite shape
  - Liquid: has a definite volume but takes the shape of its container
  - Gas: takes the shape and volume of its container



## Section 2.2

### Properties of Matter

#### Objectives

1. To learn to distinguish between physical and chemical properties
2. To learn to distinguish between physical and chemical changes

## Section 2.2

### Properties of Matter

#### A. Physical and Chemical Properties and Changes

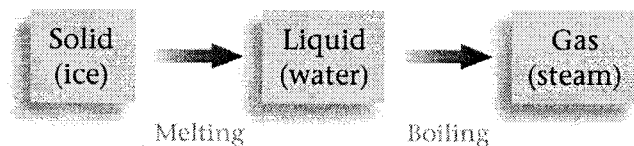
- Matter has both physical and chemical properties.
  - Chemical properties describe a substance's ability to change to a different substance.
  - Physical properties are the characteristics of a substance that do not involve changing to another substance.
    - Examples are: shape, size and color

## Section 2.2

### Properties of Matter

#### A. Physical and Chemical Properties and Changes

- Matter undergoes physical and chemical changes.
  - A physical change involves a change in one or more physical properties but no change in composition.

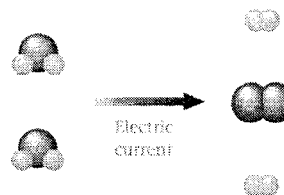


## Section 2.2

### Properties of Matter

#### A. Physical and Chemical Properties and Changes

- Matter undergoes physical and chemical changes.
  - A chemical change transforms a substance into one or more new substances.



## Section 2.3

### Classifying Matter

#### Objectives

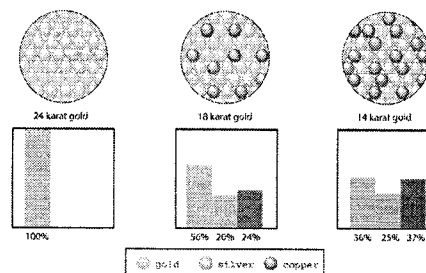
1. To learn to distinguish between mixtures and pure substances
2. To learn two methods of separating mixtures

## Section 2.3

### Classifying Matter

#### A. Mixtures and Pure Substances

- Matter can be classified as a mixture or a pure substance.



## Section 2.3

### Classifying Matter

#### A. Mixtures and Pure Substances

##### Mixtures

- A mixture has variable composition
  - A homogeneous mixture has the same properties throughout.
  - A heterogeneous mixture has different properties in different parts of the mixture.

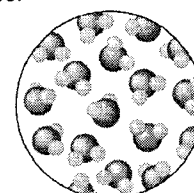
## Section 2.3

### Classifying Matter

#### A. Mixtures and Pure Substances

##### Pure Substances

- A pure substance always has the same composition.
- Pure substances are of two types:
  - Elements which cannot be broken down chemically into simpler substances
  - Compounds which can be chemically broken down into elements



Water is a compound. All the components are the same—H<sub>2</sub>O molecules.

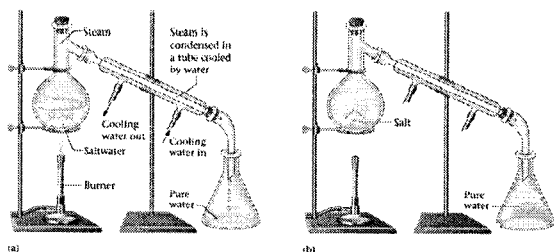
## Section 2.3

### Classifying Matter

#### B. Separation of Mixtures

Mixtures can be separated into pure substances by various means.

- distillation



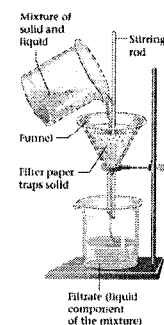
## Section 2.3

### Classifying Matter

#### B. Separation of Mixtures

Mixtures can be separated into pure substances by various means.

- filtration



Section 2.3

Classifying Matter

Summary: The Organization of Matter

