

Chapter 1 Part 1

Dr. Turner

A note...



- The power point slides will not show up correctly if you view them on the Moodle website. You will instead need to download them and look at them on PowerPoint

Matter



- Matter is anything that has mass and takes up space

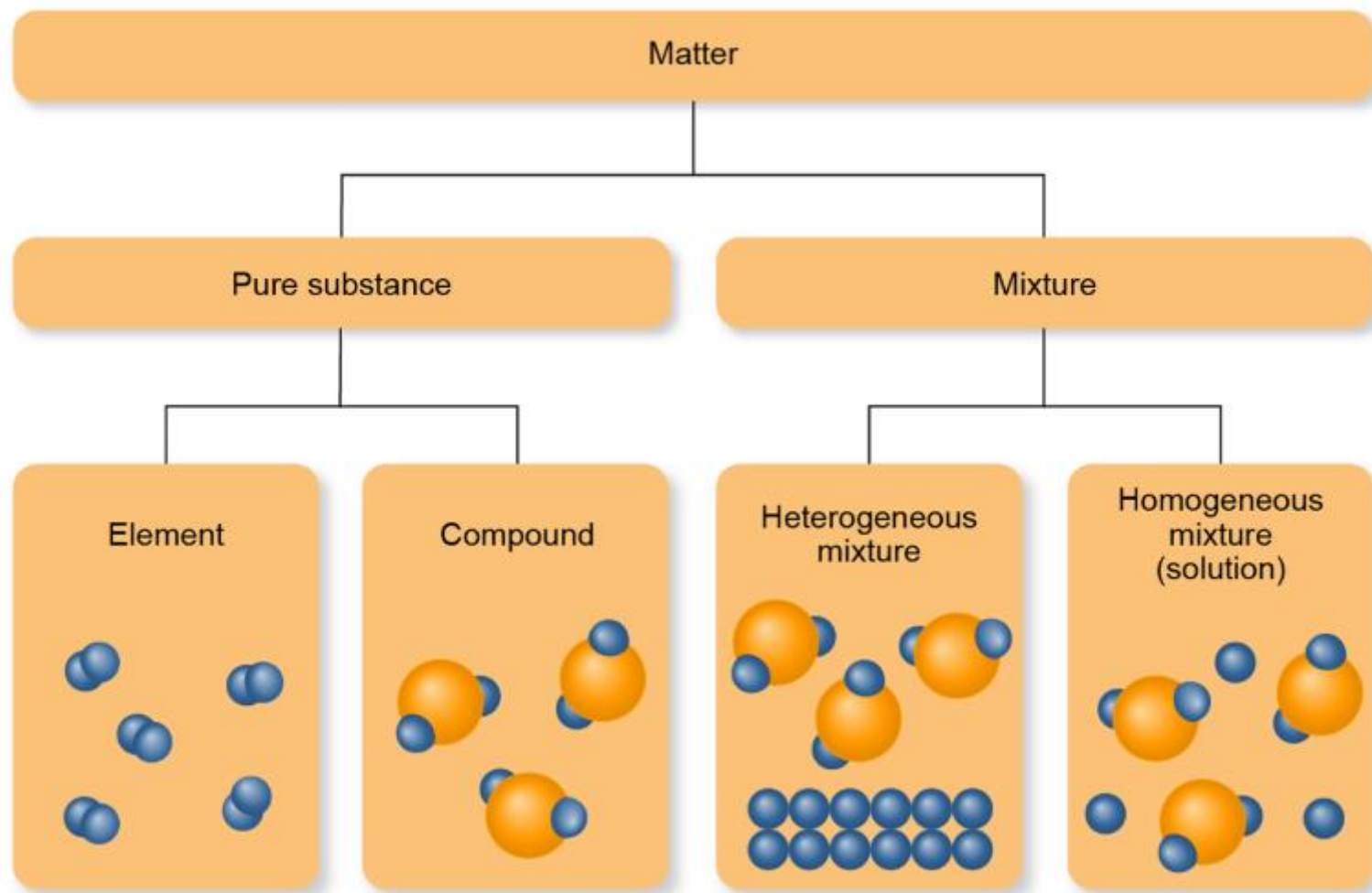
Phases of Matter

Solid: fixed volume and fixed shape

Liquid: fixed volume and variable shape

Gas: variable volume and variable shape

Classifying Matter



Classifying Matter: Atoms and Molecules

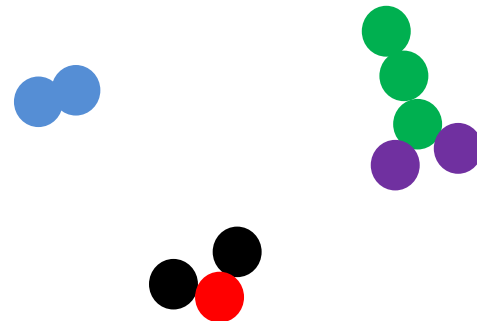
Atoms

- Smallest particle of an element
- Each colored circle represents a different atom
- Ex. Hydrogen atom, oxygen atom



Molecules

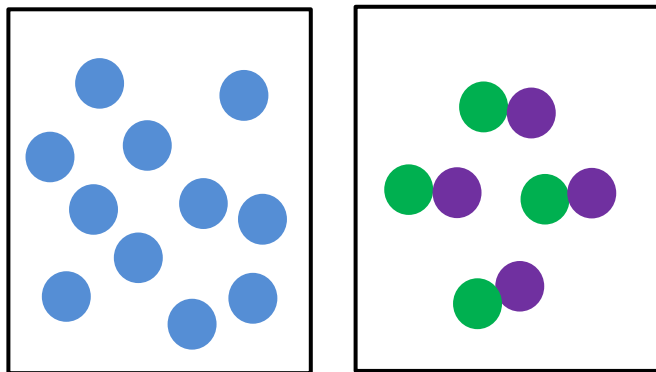
- Two or more atoms joined together by chemical bonds
- Ex. Oxygen molecule, water



Pure Substances vs. Mixtures

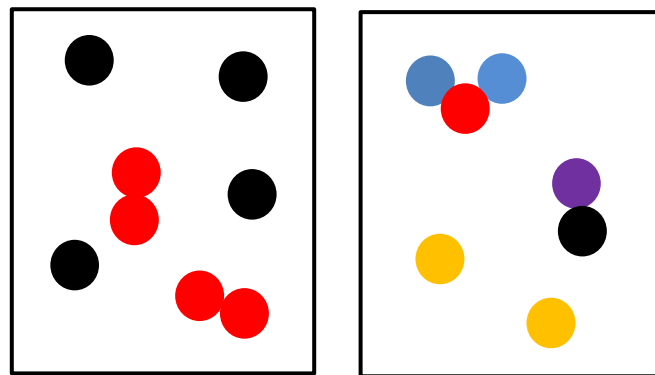
Pure substance

- Matter with a constant composition of one type of atom or molecule
- Ex. Lead, Ammonia



Mixture

- Matter without a constant composition of a single atom or molecule
- Ex. Sprite, Italian dressing



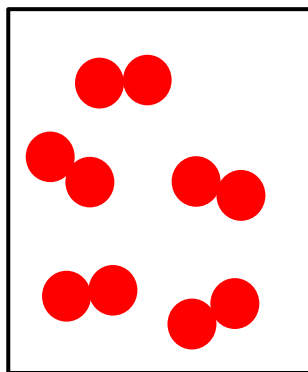
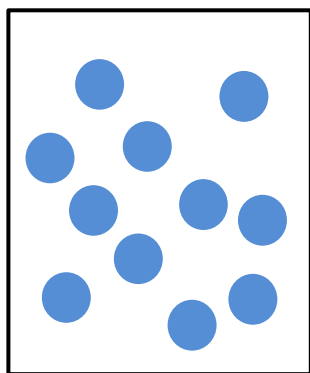
Elements vs. Compounds

Elements

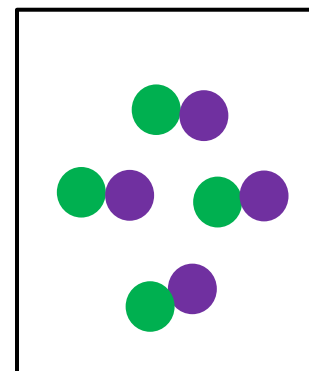
- Pure substances containing only one type of atom
- Ex. Iron, Mercury, Oxygen

Compounds

- Pure substances containing more than one type of atom
- Ex. Water, Methane, Ammonia



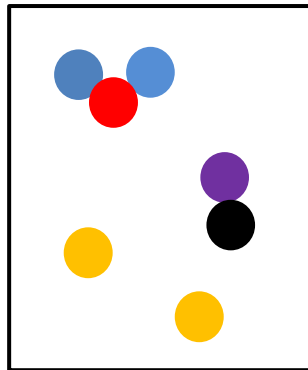
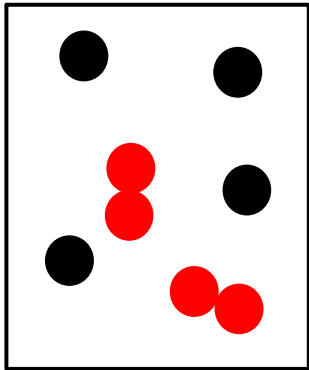
Both of these are
molecules, but
only the one is a
compound



Heterogeneous vs. Homogeneous Mixtures

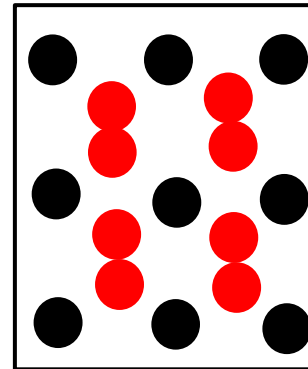
Heterogeneous Mixtures

- Mixtures that are not uniform throughout
- Ex. Philly cheese steak, Italian dressing



Homogeneous Mixtures

- Mixtures that are uniform throughout
- Also called solutions
- Ex. Salt water, sprite



Solutions

- Homogeneous mixtures are also called solutions.
- Solutions can be found in any phase.
 - ▣ The atmosphere is a gas-phase solution.
 - ▣ Metal alloys are solid-phase solutions.
 - ▣ The most common solutions are aqueous solutions, which have water as the major component.

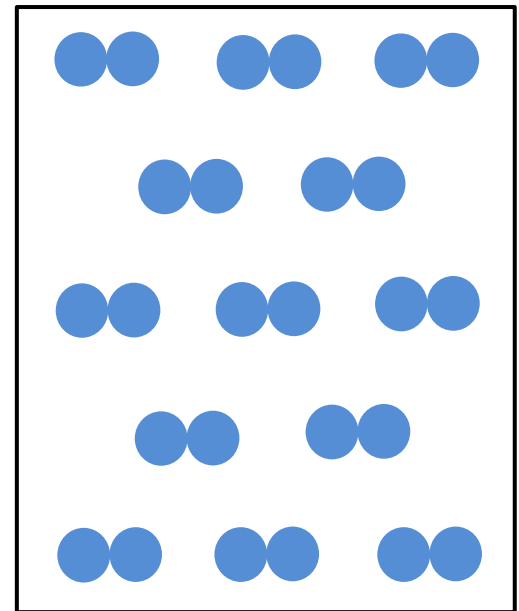
Classification of Matter

Classification	Subclassification	Examples
Pure Substances	Element	Hydrogen, sodium
	Compound	Water, table salt (NaCl)
Mixtures	Heterogeneous mixture	Oil and water mixture, chicken noodle soup
	Homogeneous mixture	Brass, vodka

Classifying Matter

Which of the following best describes the matter below?

- A. Element
- B. Compound
- C. Heterogeneous mixture
- D. Homogeneous mixture



Classifying Matter

Italian dressing is an example of a(n)

- A. Heterogeneous mixture
- B. Compound
- C. Element
- D. Homogeneous mixture

Classifying Matter

Which statement is true?

- A. Pure substances contain only one element.
- B. All mixtures with more than one element are compounds.
- C. Water, H_2O , is an element.
- D. A solution is a type of mixture.
- E. A compound is a type of mixture.

Compounds and Molecules



What is the difference between a compound and molecule?

Classification of Matter

Indicate whether each of the following statements is true or false.

- A. Every compound is a pure substance.
- B. Every compound contains two or more elements.
- C. Every mixture contains two or more compounds.
- D. Every pure substance is a compound.
- E. All mixtures are homogeneous.

Properties

- The characteristics that distinguish one type of matter from another

Some properties

Property	Meaning
Mass	The amount of matter in something
Weight	Force that gravity exerts on an object
Volume	The amount of space that something takes up
Amount	The number of something
Density	The amount of matter in a given space

Density



$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

Density

Based on mass and volume , which object has the greatest density?

- A. mass = 1 g, volume = 1 mL
- B. mass = 2 g, volume = 2 mL
- C. mass = 1 g, volume = 2 mL
- D. mass = 2 g, volume = 1 mL

Accuracy and Precision

- Gymnast Simone Biles has won more World Championship gold medals than any other gymnast. How many World Championship gold medals has she won?

Accuracy and Precision

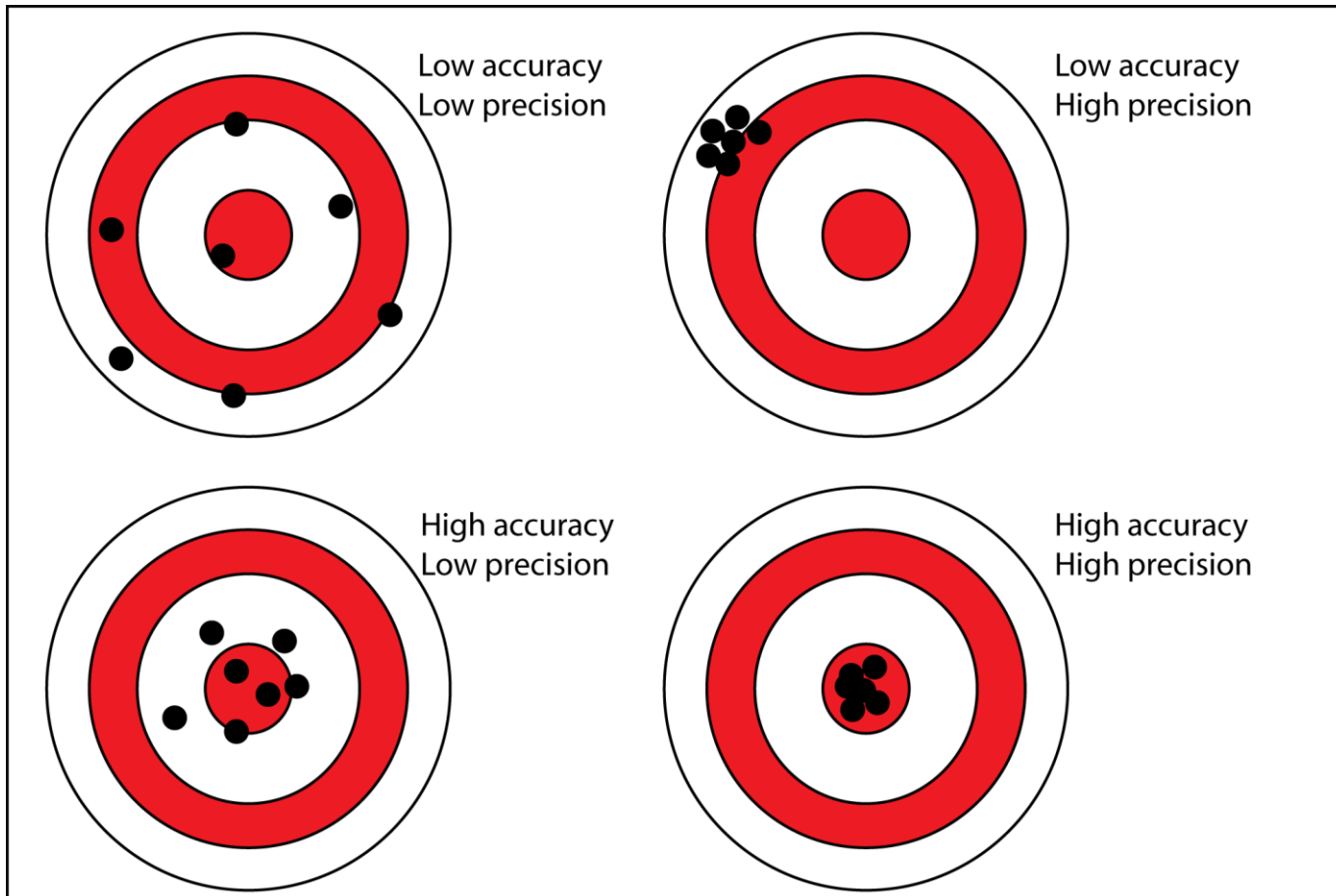
Accuracy

- A measurement is considered accurate if it yields a result that is very close to the true or accepted value

Precision

- Measurements are said to be very precise if they yield similar results when repeated in the same manner

Accuracy and Precision



Accuracy and Precision

James repeatedly measures a line 3 times and gets 2.72 in., 2.74 in., and 2.75 in. The line is actually 3.74 in. His measurements are:

- A. Accurate
- B. Precise
- C. Both A and B
- D. Neither A nor B