HONORS CHEMISTRY UNIT 2: MATTER

THE PARTICULATE NATURE OF MATTER

Matter

The atomic nature of matter



ELEMENTS AND COMPOUNDS

Elements – The letters of chemistry

Compounds- The Words of Chemistry

Molecules

Allotropes



THE STATES OF MATTER



Solid

Liquid

Gas

[PHYSICAL](http://www.almaden.ibm.com/vis/stm/images/stm12.jpg) AND CHEMICAL PROPERTIES AND CHANGES

Physical properties

Chemical properties



CHECK POINT: Identify the following as chemical or physical properties

a. The boiling point of a certain alcohol is 78oC

b. Diamond is very hard

c. Sugar ferments to form alcohol

d. a metal wire conducts and electric current

DENSITY

Density

EXAMPLES

1. What is the density of a rock with a mass of 25.2 g and a volume of 6.25 cm3?
2. Calculate the volume in mL occupied by a certain object having a density of 8.00 g/mL and a mass of 25.0 g.
3. Calculate the mass in grams of benzene having a density of 0.880 g/mL and a volume of 125 mL.

1. What is the density of an object with a mass of 15.6 g and a volume of 35.0 mL?
2. The density of Aluminum is 2.70 g/cm3. What is the mass of a piece of aluminum that occupies a volume of 60.0 cm3?
3. Calculate the volume in mL of 360. g of liquid whose density is 1.20 g/mL.

Physical changes



Chemical Changes



CHECK POINT: Identify the following as a physical or chemical change

a. Iron metal is melted

b. Iron combines with oxygen to form rust

c. Wood burns in air

d. A rock is broken into small pieces

MIXTURES AND PURE SUBSTANCES

Mixtures

Homogeneous

Heterogeneous

Pure Substances

CHECK POINT: Identify each of the following as a pure substance, a homogeneous mixture, or a heterogeneous mixture.

a. maple syrup

b. the oxygen and helium in a scuba tank

c. oil and vinegar salad dressing

d. common salt (sodium chloride)

SEPARATION OF MIXTURES

Distillation

Filtration



How would you separate a mixture of sand, salt and water?