

WHAT IS MATTER???

Name: _____

Model 1: Matter...

Matter – any thing that has mass and volume (takes up space).

All matter is composed of atoms. Matter can be classified as a...

PURE SUBSTANCE

- an element
- a compound

or

MIXTURE

- a homogenous mixture (or solution)
- a heterogeneous mixture

Examples of various types of matter:

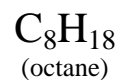
Item	Classification	Formula (or Formulas)
Aluminum	Element	Al
Hydrogen	Element	H ₂
Water	Compound	H ₂ O
Table Salt	Compound	NaCl
Glucose	Compound	C ₆ H ₁₂ O ₆
Salt water	Homogeneous Mixture	H ₂ O and NaCl
Air	Homogeneous Mixture	N ₂ , O ₂ , CO ₂ , Ar, etc...
Muddy water	Heterogeneous Mixture	H ₂ O (l) and other stuff...



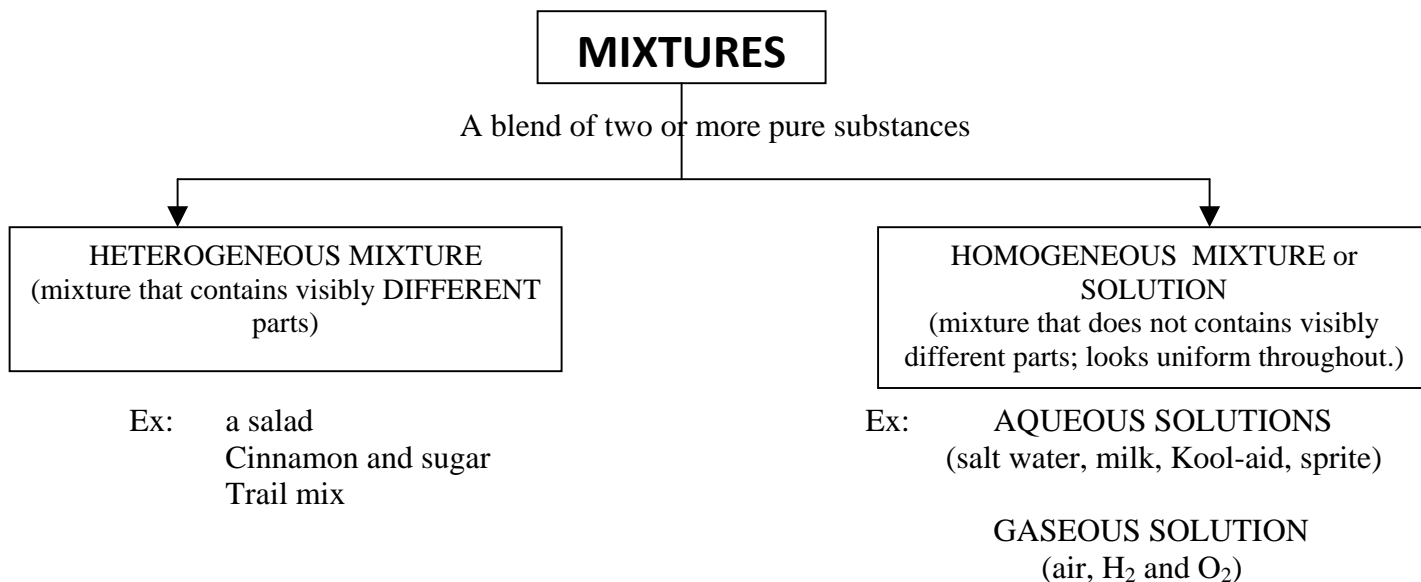
Subscript (shows how many of each element)

Critical Thinking Questions:

1. Consider Model 1. How does the formula of an element differ from that of a compound?
2. An element consists of only a single type of atom. How would you define a compound?
3. How does a pure substance (element or compound) differ from a mixture? Describe?
4. A compound is two or more different element chemically bonded in a FIXED RATIO. In Model 1, how do the examples of compounds show fixed ratios. Describe.
5. Circle which of the following are compounds.



Model 2: Mixtures



Critical Thinking Questions:

1. Describe the difference between a heterogeneous mixture and a homogeneous mixture.

2. Label the following as a heterogeneous mixture or a homogeneous mixture. Explain why.

RED PAINT

LUCKY CHARMS CEREAL

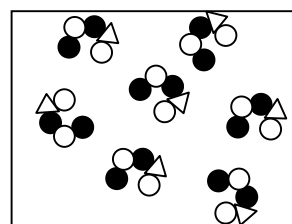
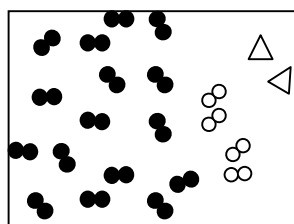
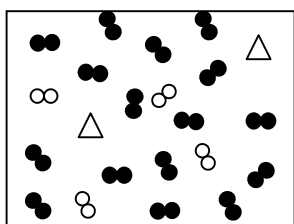
3. Consider the examples of an aqueous solution. What substance do they all have in common???

4. Complete the following definition for an aqueous solution.

Aqueous solution – homogeneous mixture involving _____.

5. Name three additional examples of an aqueous solution

6. Air is an example of a homogeneous mixture. The composition of air is about 78% N₂, 21% O₂ and 1% CO₂, H₂O, etc. Which illustration below do you think best illustrates what a sample of air would look like if you could see it? EXPLAIN WHY and explain why the other boxes are not good representations.



● = N
○ = O
▽ = CO₂, H₂O, etc

7. Alloys are a special type of mixture that involved only metals. Consider the alloy, Brass. Brass is made up of copper and zinc metal. The two metals are heated until they melt and then blended together.

a) Based on what you read about alloys, do you think alloys are HETEROGENEOUS or HOMOGENEOUS? Explain your reasoning.

b) Copper is a reddish metal. Zinc is a silvery metal. BRASS is a gold-ish blend. How does this color information also provide evidence that brass is a _____(answer to a) mixture.

8. a) Label the following as an ELEMENT, COMPOUND, HETEROGENEOUS MIXTURE or HOMOGENEOUS MIXTURE.

b) Put stars by those that are aqueous solutions.

c) Circle those that are alloys.

a. apple juice: _____

b. helium in a balloon: _____

c. 14-Karat gold: _____

d. tap water: _____

e. soil: _____

f. chocolate chip ice cream: _____

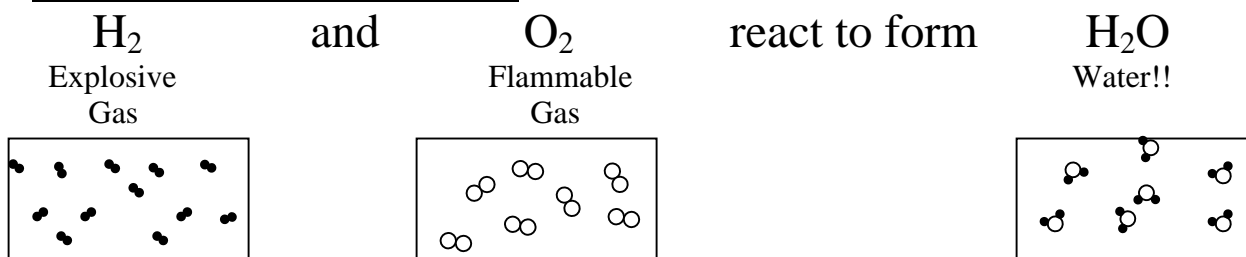
d. Silixon dioxide, SiO₂: _____

e. FeS: _____

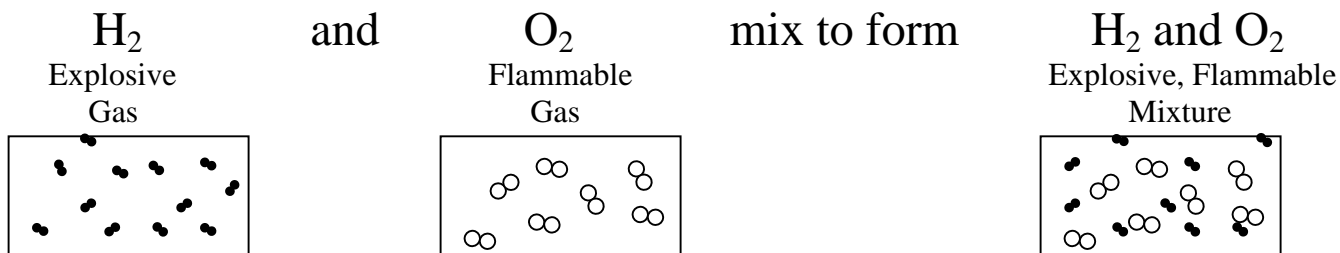
Model 3: Compounds vs Mixtures

Below, examples are given of how a mixture and a compound are formed.

FORMATION OF A COMPOUND:



FORMATION OF A MIXTURE:



Critical Thinking Questions:

1. In Model 3, what is similarity between the formation of a mixture and formation of a compound???
2. In Model 3, what is difference between the formation of a mixture and formation of a compound???
3. In which example (compound formation or mixture formation) did a CHEMICAL reaction take place? Explain how you know.
4. Based on Model 2, which of the following statements below is true? Circle one.
CHOICE 1: Properties just blend when a compound is formed whereas in a mixture, the properties change drastically.
CHOICE 2: Properties change drastically when a compound is formed whereas in a mixture, the properties just blend.