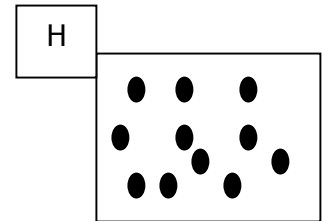
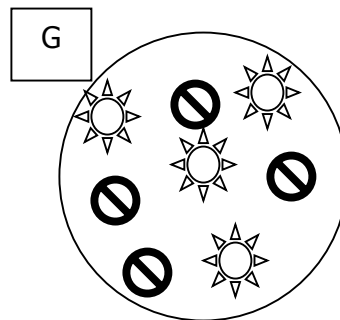
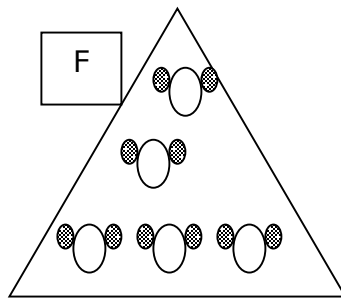
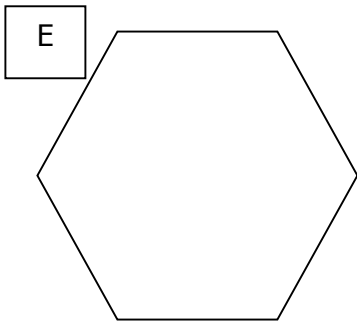
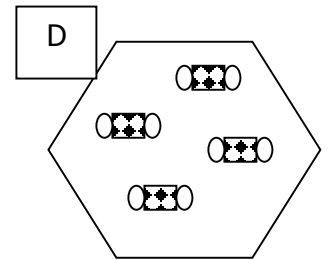
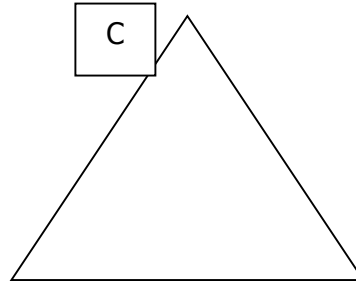
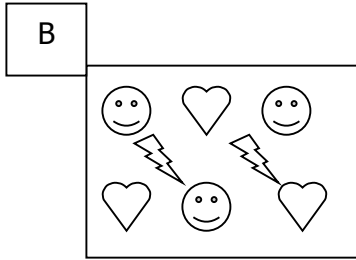
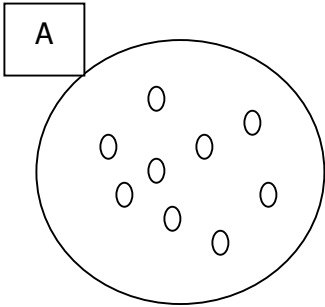


Classification of Matter

Purpose: What is the goal of this activity? By the end of this activity what will you have learned? Come back to the purpose after you have already completed the activity.

Problem # 1

Group the following items by similar characteristics. Describe what characteristic is in common with the grouped items.



Matching Sets	Describe <i>why</i> you matched groups together. For example: You could match sets together based on similar number of items, similar shape, similar color, etc. Be specific and detailed.

Name: _____ Per _____

Problem # 2

Group the following examples of matter into like categories. Indicate your reason for each set. You must decide how many groups to assign. You may place items in two or more groups.

H ₂	H ₂ O	air	chex mix	Kool-aid
salad	Mountain Dew	C ₆ H ₁₂ O ₆	Na	brass
Fe	gold	milk	dirt	CO ₂
NaCl	grape juice	O ₂		

Group 1	Group 2	Group 3
Reason: _____ _____	Reason: _____ _____	Reason: _____ _____

Group 4	Group 5	Group 6
Reason: _____ _____	Reason: _____ _____	Reason: _____ _____

Where there any of the above examples of matter that you classified into more than one group? _____

If yes, why did you classify those examples into more than one group? What properties or characteristics do these items have? _____

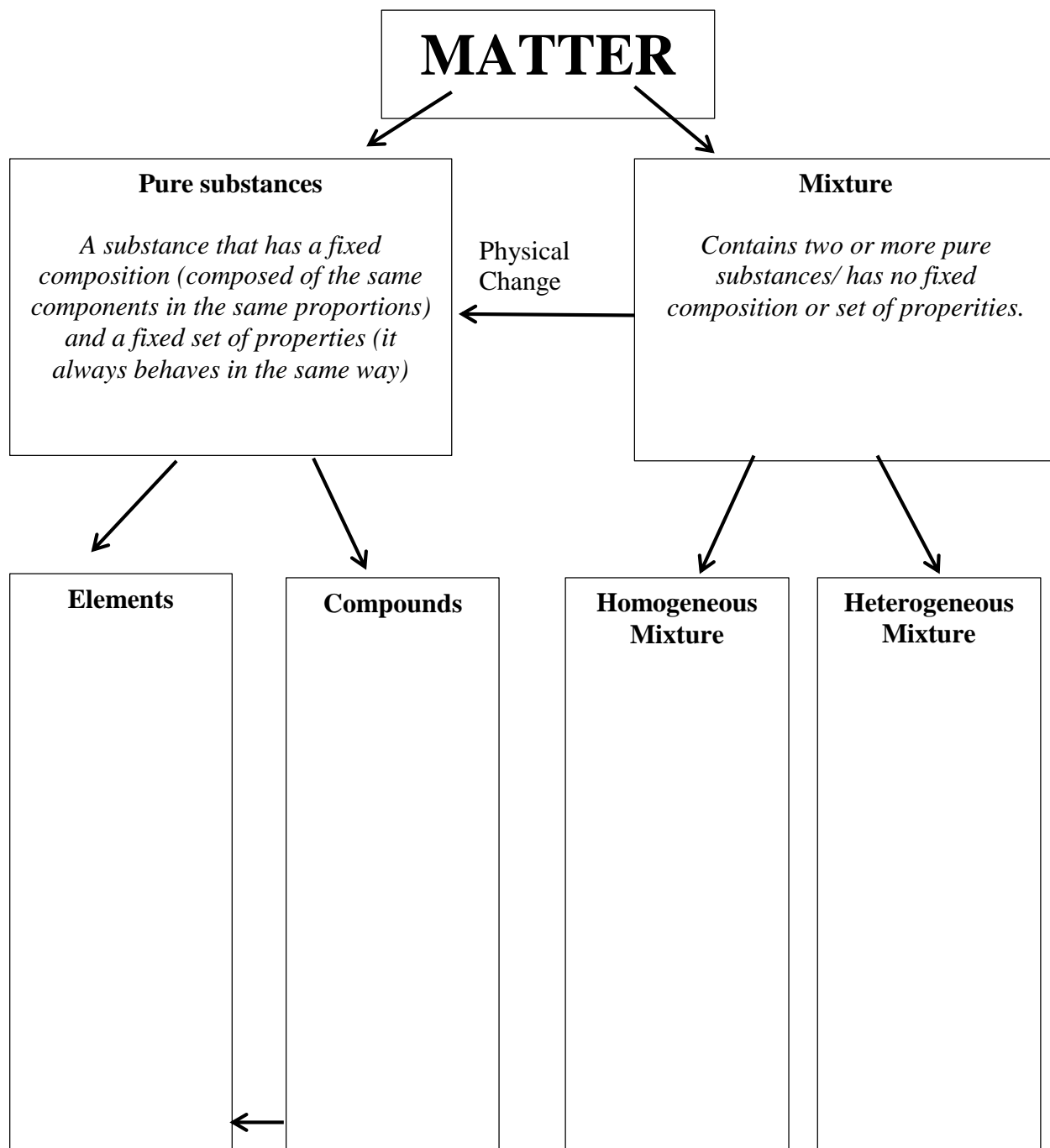
Name: _____ Per _____

Were there any items that you feel did not fit into a group? _____

If yes, why did these items not fit into any group? _____

Matter is classified as either **pure substances** or **mixtures**. Each of these categories is further subdivided. Pure substances are divided into **elements** (containing only one kind of atom) and **compounds** (two or more atoms chemically bonded). Mixtures are divided into two categories: **homogeneous mixtures** (uniform consistency throughout – it looks like one substance but is actually two or more substances physically mixed) and **heterogeneous mixtures** (no uniform consistency – easy to identify the separate parts).

Directions: Use the above information to fill out the following graphic organizer. For each box give an example using one of the items in problem 2.



Name: _____ Per _____

Chemical change is any change that results in the formation of new chemical substances. At the molecular level, chemical change involves making or *breaking of bonds* between atoms. These changes are chemical: iron rusting (iron oxide forms) gasoline burning (water vapor and carbon dioxide form).

A **physical change** is any change NOT involving a change in the substance's chemical identity. Here are some examples: (1) any phase change. Moving between solid, liquid and gas involves only the amount of energy in the sample

Problem # 3

On the front lab bench there are eight different substances. Classify each as either a pure substance or a mixture, and then either an element or compound, homogenous or heterogeneous mixture. Then provide your evidence for choosing these classifications.

Substance	Pure Substance or Mixture	Element vs. Compound or Homogenous vs. heterogeneous	Evidence to support your claim.
1			
2			
3			
4			
5			
6			
7			

Classification of Mixtures

1. A mixture contains iron filings (small pieces of iron metal), sand, poppy seeds, and salt. You have the following materials: water, beaker, funnel, filter paper, magnet, graduated cylinder, tweezers, and hot plate. You may use any or all of the equipment. Your goal is to separate all the parts of the mixture. Write a description of how you would go about separating the mixture. The description must be in order. If you need more room, write your answer on the back.

2. Classify the following as a homogeneous or heterogeneous mixture.

- _____ a. a pail of sand and water
- _____ b. air
- _____ c. human blood
- _____ d. a banana split
- _____ e. chocolate syrup
- _____ f. sea water

3. Classify each of the following as an element or a compound.

- _____ a. benzene, C_6H_6
- _____ b. Aluminum, Al
- _____ c. aspirin, $C_9H_8O_4$
- _____ d. titanium, Ti
- _____ e. acetylene, C_2H_2
- _____ f. zinc, Zn

4. Determine which of the following are pure substances and which are mixtures.

- _____ a. salt water
- _____ b. isopropyl alcohol, C_3H_8O
- _____ c. mercury, Hg
- _____ d. ammonia, NH_3
- _____ e. an egg yolk
- _____ f. honey