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Worksheet #1: Matter

Answer the following questions using your Unit 1 notes and your textbook pages 34- 47.

1. What is matter? _____

   a) Give TWO examples of matter. 1) _____ 2) _____

2. Classify each of the following as an intensive property [**I**] or an extensive property [**E**].

   1) Mass _____ 4) Color _____

   2) Density _____ 5) Volume _____

   3) Melting point _____ 6) Length _____

3. Classify the following examples as ***intensive*** or ***extensive*** properties of matter.

   a) Your pencil is yellow. _____

   b) Your watch is 12cm long. _____

   c) Your t-shirt is made of cotton. _____

   d) The mass of a basketball is 0.62 kg. _____

   e) The outer covering of the ball is rubber._____

4. List 3 extensive properties and 3 intensive properties of a Pepsi can.

EXTENSIVE	**INTENSIVE**
1.	1.
2.	2.
3.	3.

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Worksheet #2: Density

Answer the following questions using your Unit 1 Notes, lab discussions and your textbook pages 64-65 and 80-81.
***SHOW ALL YOUR WORK**, include units, and circle your final answer to receive credit.*

1. Circle the following unit(s) that could be used for density. *(HINT: 1 mL also equals 1 cm^3)*

   g/mL L/g kg/cm^3 mL/cm^3 g/cm

2. In a glass of ice water, the ice cubes are on top of the water. What can you say about the density of solid water in relation to the density of liquid water?

3. A rock has a mass of 127 g and displaces 32.1 mL of water. What is the density of the rock? (3.97 g/mL)

4. The density of gold is 19.32 g/mL. You have a shiny, gold-colored bar of metal which weighs 57.3 g and has a volume of 4.7 mL. Is your metal bar pure gold? _____ (YES or NO)

5. The density of aluminum is 2.7 g/mL. What is the volume of 8.1 grams? (3 mL)

6. You have 250 mL of ethanol that has a density of 0.78 g/mL. What is the mass of the liquid? (195g)

7. Three balloons are each filled with a different gas: hydrogen (0.0899 g/L), carbon dioxide (1.977 g/L), and helium (0.1785 g/L). The balloons are released into the air. Which balloon will float the highest in the air (*air has a density of 1.29 g/L*)? _____

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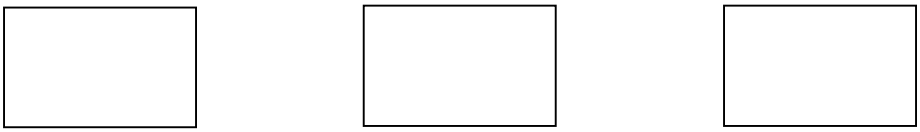
Worksheet #3: Physical and Chemical Changes

Answer the following questions using your Unit 1 Notes, lab discussions and your textbook pages 64-65 and 80-81. Show your work, include units, and circle your final answer to receive credit.

1.Draw three diagrams to illustrate the difference in the particles of a gas, liquid, and solid.



Solid Liquid Gas

2. Distinguish between the three states of matter based on their shape, volume, and compressibility.

	SOLID	**GAS**	**LIQUID**
Shape	_____	_____	_____
Volume	_____	_____	_____
Compressibility	_____	_____	_____

3. Classify each of the following as a physical or chemical property.

a) iron and oxygen form rust _____

b) iron is more dense than aluminum _____

c) magnesium burns brightly when ignited _____

d) oil and water do not mix _____

e) mercury melts at -39^{o}C _____

4. What kind of change (physical or chemical) occurs when a **mixture** is separated into its components? Explain your answer.

5. What kind of change (physical or chemical) occurs when a **compound** is separated into its components? Explain your answer.

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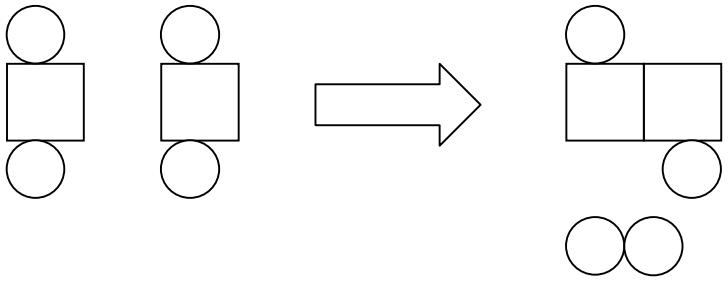
6. Can you recognize the chemical and physical changes that happen all around us? If you change the way something looks, but haven't made a new substance, a **physical change** (P) has occurred. If the substance has been changes into another substance, a **chemical change** (C) has occurred.

1.		An ice cube is placed in the sun. Later there is a puddle of water. Later still the puddle is gone.
2.		Two chemicals are mixed together and a gas is produce.
3.		A bicycle changes color as it rusts.
4.		A solid is crushed to a powder.
5.		Two substances are mixed and light is produced.
6.		Mixing salt and pepper.
7.		Chocolate syrup is dissolved in milk.
8.		A marshmallow is toasted over a campfire.
9.		A marshmallow is cut in half.

7. A friend tells you that, "Because composition does not change during a physical change, the appearance of a substance does not change." Is your friend correct? Explain your answer.

8. Does the following diagram represent a ***physical*** or ***chemical*** change? Explain your choice.



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9. Read each scenario. Decide whether a physical or chemical change has occurred and give evidence for your decision. The first one has been done for you to use as an example.

	Scenario	Physical or Chemical Change?	Evidence…
1.	Yum! A student removes a loaf of bread hot from the oven. The student cuts a slice off the loaf and spreads butter on it.	*Physical*	*No change in substances.* *No unexpected color change, temperature change or gas given off.*
2.	Your friend decides to toast a piece of bread, but leaves it in the toaster too long. The bread is black and the kitchen if full of smoke.		
3.	You forgot to dry the bread knife when you washed it and reddish brown spots appeared on it.		
4.	You blow dry your wet hair.		
5.	In baking biscuits and other quick breads, the baking powder reacts to release carbon dioxide bubbles. The carbon dioxide bubbles cause the dough to rise.		
6.	A straight piece of wire is coiled to form a spring.		
7.	Food color is dropped into water to give it color.		
8.	Chewing food to break it down into smaller particles represents a _____ change, but the changing of starch into sugars by enzymes in the digestive system represents a _____change.		
9.	In a fireworks show, the fireworks explode giving off heat and light.		

10. Based on the law of conservation of mass, how does the mass of reactants compare with the mass of products in a given reaction? _____

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11. A 28.0 g sample of nitrogen gas (N_2) combines completely with 6.0 g of hydrogen gas (H_2) to form ammonia (NH_4). What is the mass of ammonia formed? *Show your work.*

N_2 + H_2 → NH_4

12. Hydrogen (H_2) and oxygen (O_2) react chemically to form water (H_2O). How much water would form if 4.8 grams of hydrogen reacted with 38.4 grams of oxygen?

H_2 + O_2 → H_2O

13. When 400 grams of wood are burned, 30 grams of ash remain. What happened to the missing 370 grams of matter?

_____

_____

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Worksheet #4: Substances vs. Mixtures

1. Classify each of the following as a substance **(S)** or a mixture **(M)**.

a) gold (Au) _____

b) vegetable soup _____

c) saltwater _____

d) magnesium oxide (MgO) _____

e) Milk _____

f) Gasoline _____

g) Air _____

2. What is the difference between a heterogeneous mixture and a homogeneous mixture? Give an example of each.

3. What is the difference between an element and a compound? Give two examples of each.

4. A blue solid is changed into a white substance and a colorless gas. Was the blue solid an element or a compound? Explain your reasoning.

5. From the following list of substances, **circle** the ones that are elements:

silver	carbon dioxide	wood	alcohol
water	hydrogen	carbon	nitrogen
gold	sugar	salt	air
magnesium	nickel	chromium	oxygen

6. Write **E** if the material is heterogeneous or **O** if it is homogeneous.

1) Wood _____

2) Black coffee _____

3) Water _____

4) Lucky Charms® _____

5) Salt _____

6) Rocky soil _____

7) Sausage-and-mushroom pizza _____

8) Air _____

9) Milk _____

10) Gold _____

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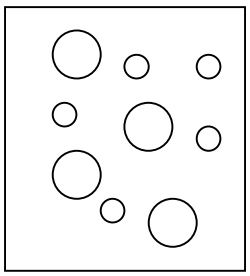
7. Classify the following as an ***element***, a ***compound***, a ***solution***, or a ***heterogeneous mixture***:

a) aluminum _____
b) carbon dioxide _____
c) sugar and water _____
d) sulfuric acid _____
e) an orange _____
f) a pencil _____
g) raisin bread _____
h) water _____
i) sulfur _____
j) nitrogen _____
k) water & instant coffee _____
l) carbon particles & sugar _____

8. Label each model as a compound, element, or mixture.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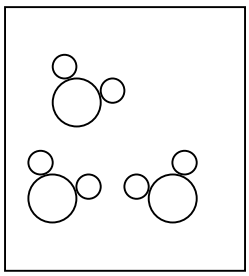
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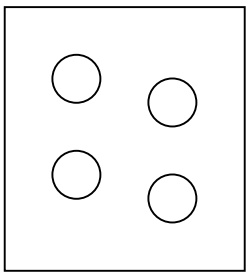
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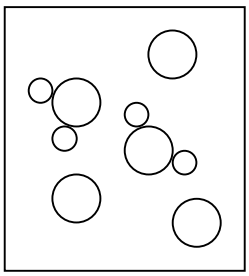
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9. Complete the following table concerning substances and mixtures.

	Substance or Mixture	If Substance: Element or Compound?	If Mixture: Homogeneous or Heterogeneous?
Salt (NaCl)			
Stainless Steel			
Iron (Fe)			
Urine			
Chicken Noodle Soup			
Nitrogen (N_2)			
Carbon Dioxide (CO_2)			
Lithium (Li)			
Octane (C_8H_{16})			
Kool Aid			
Lemonade			

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Unit 1 Review Problems

Matter & Change

Answer the following questions either below the question OR on a separate sheet of paper. Then, check your answers on the class website.

1. What is the difference between intensive and extensive properties? Name 3 of each.

2. Compare the **space** between solid particles, liquid particles, and gas particles.

3. Complete the following table.

Physical state	Definite Shape?	Definite Volume?	Easily Compressed?
GAS			
	no		no
	yes		

4. Describe how to separate each substance in a mixture of sand, salt and water.

5. Define the Law of Conservation of Mass. In the complete reaction of 22.99 g of sodium (Na) with 35.45 g of chlorine (Cl_2), what mass of sodium chloride (NaCl) is formed?

$Na + Cl_2 \rightarrow NaCl$

6. Determine if the following are **physical** or **chemical** properties:

a) Color = _____

b) Ability to rust = _____

c) Melting point = _____

d) Boiling point = _____

e) Ability to react with acid = _____

f) Malleability = _____

g) Luster = _____

h) Composition = _____

7. Determine if the following are physical or chemical changes:

a) Condensation = _____

b) Explosion = _____

c) Zinc reacts with acid = _____

d) Iron rusting = _____

e) Boiling water = _____

f) Melting an ice cube = _____

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8. A piece of wood is manipulated in the following was. Tell whether there has been a physical or chemical change.

a) It is split= _____ c) It decays = _____

b) It is painted = _____ d) It is cut = _____

9. Chemical symbols represent what? _____

10. What is the difference between a homogeneous and heterogeneous mixture? Give an example for each.

11. Classify each of the following as a **solution**, a **heterogeneous mixture**, a **compound**, or an **element**:

a) Sand= _____ f) Carbon dioxide = _____

b) Salt = _____ g) Gold ring = = _____

c) Pure Water = _____ h) Salad dressing = _____

d) Soil = _____ i) Raisin bran cereal = _____

e) Hydrogen = _____ j) Ice tea = _____

12. What is a phase? _____

a) How many phases does a homogenous mixture have? Heterogeneous mixture?

13. What is the difference between the separation methods of distillation and filtration?

14. How many grams of liquid water are produced when 60 grams of ice melt? _____

15. The density of an object is 7.5 g/mL. Calculate the mass in grams of a 1200 mL sample.

16. The volume of a substance is 27 mL. What is the density of the substance that has a mass of 8.1 grams?

17. Density is an _____ property and is used to determine the _____ of a substance.