••• Due date: **Tuesday,** **08/22/23 (first thing in class)**

1. Watch Chemistry 1.1 Matter & Properties Part 1 and answer the following questions.

<https://www.youtube.com/watch?v=TF8rxXs-QSY> (7:53)

1. Matter is anything that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Give an example of something that is **NOT** matter.
3. Define **extensive property** and give an example.
4. Define **intensive property** and give an example.
5. Define **physical property** and give an example of a physical property of aluminum foil.
6. Define **physical change**. What is a physical change you can do to the aluminum foil?
7. Define **change in state** and give an example.
8. A change in state is ALWAYS a physical property. TRUE or FALSE

2. Watch GCSE Chemistry States of Matter and changing state #20 and answer the following questions. .<https://www.youtube.com/watch?v=hkBrw2fG75U> (4:21)

a. Draw the three states of matter in the boxes below and label the arrows with the appropriate phase change (vaporization, melting, freezing, and condensation.)

**SOLID** **LIQUID** **GAS**

b. Describe each of the phases in terms of how the particles are moving.  
  
**solid  
  
liquid  
  
gas**  
  
c. Describe each of the phases in terms of **intermolecular forces** (attractions between the particles).   
  
**solid  
  
liquid  
  
gas**

d. Describe each of the phases in terms of **shape** and **volume**.  
  
**solid  
  
liquid  
  
gas**  
  
e. Which of the three phases is **easily compressible** and why?

3. Watch GCSE Chemistry – Differences between Compounds, Molecules & Mixtures #3 and answer the following questions.

<https://www.youtube.com/watch?v=jBDr0mHyc5M&list=PLidqqIGKox7WeOKVGHxcd69kKqtwrKl8W&index=3> (5:52)

**Atom** – the basic unit of matter that retains the properties of an element.  
  
**Element** – made up of one type of atom and cannot be broken down into simpler substances.

a. A molecule is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  
  
b. A compound is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

c. Circle the molecules. O2 CO2 NaCl H2O He Cu

d. Circle the compounds. O2 CO2 NaCl H2O He Cu

e. Identify how many particles of each element are represented by a single unit of the following formulas.  
  
H2O H \_\_\_\_\_ O \_\_\_\_  
  
Ca3(PO4)2 Ca \_\_\_\_\_ P \_\_\_\_\_ O \_\_\_\_\_  
  
C6H12O6 C \_\_\_\_\_ H\_\_\_\_\_ O \_\_\_\_\_  
  
Ba(OH)2 Ba \_\_\_\_\_ O \_\_\_\_\_ H \_\_\_\_\_

4. Watch part of Chemistry 1.2 Classifying Matter and answer the following questions. <https://www.youtube.com/watch?v=ZZYjleLadlc> (stop at 7:41)

a. A substance is a type of matter that is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and has a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  
  
b. Complete the flow chart.

Element  
ex. H

Compound   
ex. H2O

c. Another name for a **homogeneous mixture** is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  
  
d. What is the difference between a **homogeneous mixture** and a **heterogeneous mixture**?

e. Classify the following as either a pure substance, solution, or heterogeneous mixture.  
  
a)   mercury  in  a  thermometer  –    
       
b)   exhaled  air  –       
    
c)   minestrone  soup  –   
        
d)   sugar  –  

5. Watch Physical and Chemical changes and answer the following questions. <https://www.youtube.com/watch?v=X328AWaJXvI>  (11:07).

a. What is the difference between **a physical change** and a **chemical change**?

b. Classify the following as either a **physical change (P)** or **chemical change (C)**.

Hydrogen exploding in the presence of a spark  –      

Sugar dissolving in ice tea  –      

Hammering aluminum into a thin sheet  –         
  
 Dry ice sublimes (changes from solid directly to vapor)  –

Firefly emitting light-

c. Chemical changes are chemical reactions. Below is the chemical reaction for the formation of water. Label the reactants and products in the following reaction.  
  
 2H2  + O2 🡪 2H2O

6. Watch the following video if you need a review of proper scientific notation and standard form, <https://www.youtube.com/watch?v=6y35Jlz332M> (7.11)  
  
a. Write the following numbers in **proper** scientific notation.  
   
 6,796,000,000  
  
 0.0000158

0.0327  
  
 42.3 x 102  
  
 0.022 x 10-1  
  
b. Write the following numbers in standard notation.  
  
 1.3 x 106

1.1 x 10-4  
  
 1.9 x 102  
  
 7.41 x 10-10

7. Watch the following video for a review of dimensional analysis and answer the following questions **using dimensional analysis**. Helpful conversion factors are at the end of this assignment. <https://www.youtube.com/watch?v=HRe1mire4Gc> (6:14)

🢡 **IMPORTANT NOTE –** in RVGS Chemistry, you must ***ALWAYS*** show your work. If you do not,

you will not receive credit on the assignment, nor will you receive credit for your answers on quizzes and tests. Make whatever adjustments are necessary to do this – it's not an option.

a. A student loses 3.3 lb in one month. How many grams did he lose?

b. A runner wants to run 10.0 km. She knows that her running pace is 7.5 mi/h. How many minutes must she run? *Hint:* Use 7.5 mi/h as a conversion factor between distance and time.

c. Convert 445 yd to meters.  
  
  
  
  
d. Convert 45.3 inches to millimeters.

8. Watch Unit Conversion and Significant Figures: Crash Course Chemistry #2 and answer the following questions. <https://www.youtube.com/watch?v=hQpQ0hxVNTg> (11:23) You may need to watch the part about significant figures more than once.

a. Convert 5.2 x 10-12 light years per second into miles per hour. 1 light year = 5.9 x 1012 miles You must show your work using dimensional analysis!!

b. Explain the difference between an exact number and a measured number. Use an example in your explanation.

c. Label the following numbers as either exact numbers (E) or measured numbers (M)? In the measured numbers, identify the number of significant figures.  
  
 14 apples  
  
 2.54 cm is the definition of an inch  
  
 23.5 g of a chemical  
  
 5.13 cm length of a paper clip

***Conversion Factors***

**LENGTH VOLUME MASS**

1 cm = 10 mm 1 cm3 = 1 mL 1 g = 1000 mg

1 m = 100 cm 1 gal = 4 qt 1 kg = 1000 g

1 km = 1000 m 1 gal = 3.785 L 1 lb = 453.6 g

1 in = 2.54 cm 1 L = 1000 mL 1 ton = 2000 lbs

1 mi = 1609 m 1 qt = 946 mL 1 oz = 28.35 g

1 mi = 5280 ft 1 qt = 4 cups

1 ft = 30.5 cm 1 cup = 16 tbsp

1 yd = 91.4 cm 1 tbsp = 3 tsp

1 nm = 1 x 10–9 m 1 tsp = 4.93 mL