Name: _____

RVGS Chemistry Summer Assignment (2024-25)

••• **Due date:** Tuesday, 08/20/24 (first thing in class)

Expect a quiz on this material within the first two weeks of class.

1. Watch Chemistry 1.1 Matter & Properties Part 1 and answer the following questions. https://www.youtube.com/watch?v=TF8rxXs-QSY (stop at 7:53)

a. Matter is anything that _____.

b. Give an example of something that is **NOT** matter.

c. Define **extensive property** and give an example.

d. Define **intensive property** and give an example.

e. Define **physical property** and give an example of a physical property of aluminum foil.

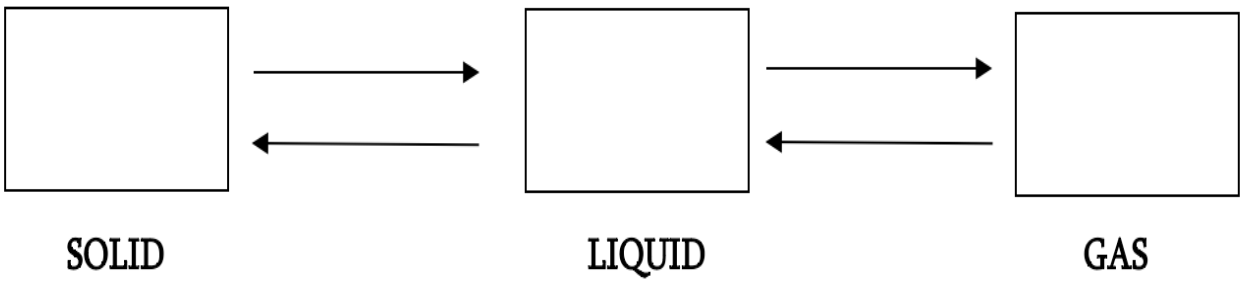
f. Define **physical change**. What is a physical change you can do to the aluminum foil?

g. Define **change in state** and give an example.

h. A change in state is ALWAYS a physical change. **TRUE** or **FALSE** (circle one)

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

a. Draw the three states of matter in the boxes below, and include at least 5 particles. Label the arrows with the appropriate phase change (vaporization, melting, freezing, and condensation.)



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
(stop at 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 _____.

What type of bond holds a molecule together? _____

b. A compound is _____.

c. Circle the molecules: O_2 CO_2 NaCl H_2O He Cu

d. Circle the compounds: O_2 CO_2 NaCl H_2O He Cu

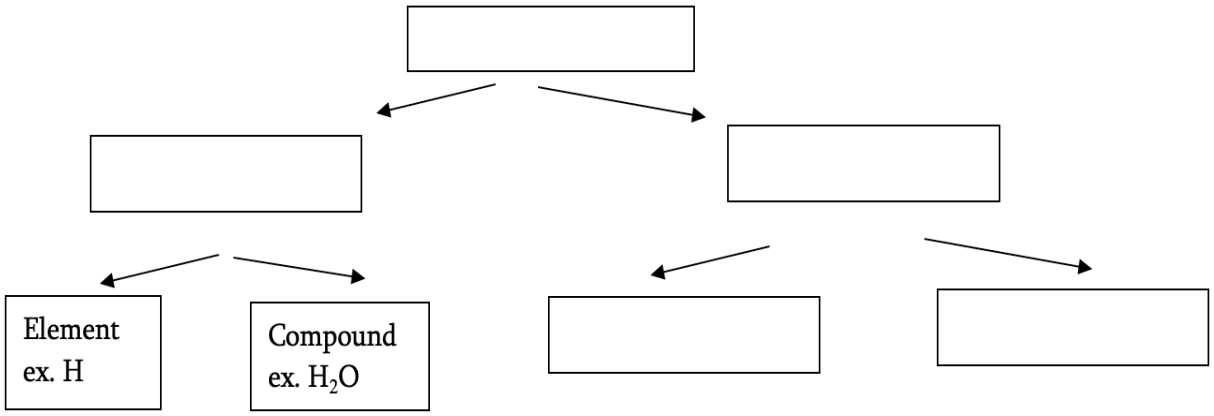
e. Identify how many atoms of each element are represented by a single unit of the following formulas.

H_2O	H _____	O ____	
$Ca_3(PO_4)_2$	Ca _____	P _____	O _____
$C_6H_{12}O_6$	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 for matter below.



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 a solid directly to a 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.

$2H_2 + O_2 \rightarrow 2H_2O$

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 → _____ 42.3×10^{2} →_____

0.022×10^{-1}→ _____

b. Write the following numbers in **decimal notation**.

1.3×10^{6} → _____ 1.1×10^{-4} → _____

1.9×10^{2} → _____ 7.41×10^{-10} →_____

7. Watch the video Unit Conversion the Easy Way (Dimensional Analysis) 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 lbs in one month. How many grams did he lose? Use dimensional analysis.

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/hr as a conversion factor between distance and time. Use dimensional analysis.

c. Convert 445 yd to meters. Use dimensional analysis.

d. Convert 45.3 inches to millimeters. Use dimensional analysis.

8. Watch Unit Conversion and Significant Figures Crash Course Chemistry #2 and answer the following questions. https://www.youtube.com/watch?v=hQpQ0hxVNTg (up to 7:53)

a. Convert 5.2×10^{-12} light years per second into miles per hour. (1 light year = 5.9×10^{12} 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).

5.13 cm (length of a paper clip) → _____

2.54 cm (the definition of an inch) → _____

68.5 g of a chemical → _____

14 apples → _____

CONVERSION FACTORS

LENGTH	**VOLUME**	**MASS**
1 cm = 10 mm	1 cm^3 = 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	