

1. Label the following statements as a (A) Physical Change or (B) Chemical Change

A Boiling Water

B Decomposing water to H_2 and O_2 gas by passing an electric current through it.

B Exploding of potassium metal when placed in water

A Breaking of glass

A Making lemonade (mixing lemons + water + sugar)

B Frying eggs

B Burning a Candle

B Whipping cream

B Leaves Changing Color

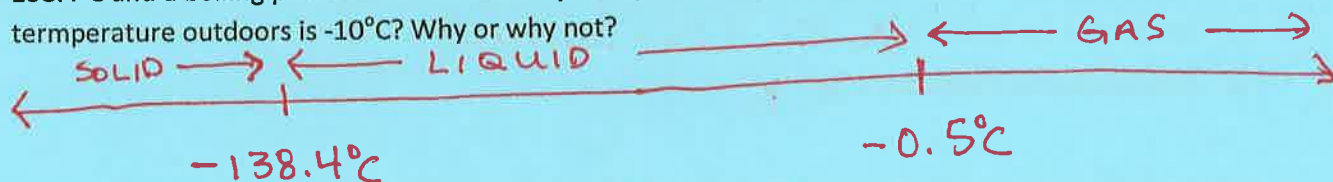
2. Name and describe the three states of matter

SOLID – DEFINITE SHAPE AND VOLUME; USUALLY THE DENSEST FORM OF A SUBSTANCE (i.e. ATOMS CLOSEST TOGETHER)

LIQUID – DEFINITE VOLUME; SHAPE OF THE CONTAINER FLUID IN NATURE; ATOMS CLOSE TOGETHER

GAS – SHAPE AND VOLUME DETERMINED BY THE CONTAINER ATOMS FAR APART FROM ONE ANOTHER

3. Butane (C_4H_{10}) is an easily compressible, flammable gas used in cigarette lighters. It has a melting point of $-138.4^\circ C$ and a boiling point of $-0.5^\circ C$. Would you expect a butane lighter to work in winter when the temperature outdoors is $-10^\circ C$? Why or why not?



NO – IT WOULD BE IN THE LIQUID STATE RATHER THAN THE GAS PHASE THAT IS NEEDED TO BURN

4. Hydrogen peroxide, often used to disinfect cuts and scrapes, breaks down to yield water and oxygen

Hydrogen Peroxide \rightarrow water + oxygen

- A. Identify the reactants and products

REACTANTS (SUBSTRATES) = Hydrogen peroxide

PRODUCTS = WATER + OXYGEN

- B. Which of the substances are chemical compounds, and which are elements?

OXYGEN = ELEMENT ; WATER & HYDROGEN PEROXIDE = COMPOUNDS

5. Describe the general properties of metals, metalloids, and nonmetals:

METALS - LUSTROUS SOLID ; MALLEABLE SOLIDS ; GOOD CONDUCTORS OF HEAT & ELECTRICITY

METALLOIDS - PROPERTIES IN-BETWEEN METALS & NON-METALS ; GOOD SEMI-CONDUCTORS

NONMETALS - BRITTLE SOLIDS ; MANY ARE GASES AT ROOM TEMP. ; NON-CONDUCTIVE

6. Supply the missing names or symbols below:

Na Sodium

N Nitrogen

Hg Mercury

Cl Chlorine

P Phosphorous

K Potassium

Mo Molybdenum

Cu Copper

Ag Silver

7. Correct the following statements:

a. The symbol for Bromine is ~~BR~~ Br

b. The symbol for Manganese is ~~Mg~~ Mn (Mg = Magnesium)

c. The symbol for Carbon is ~~Ca~~ C (Ca = calcium)

d. The symbol for Potassium is ~~PK~~ K

8. What are the units used in the SI system and the Metric System to measure:

Measurement	SI System	Metric System
Mass	kg	g
Length	m	m
Volume	m ³	L
Temperature	K	°C

SECTION 2:

9. Write the symbol for the following units:

- a. Nanogram ng
- b. Microliter μL
- c. Milligram mg
- d. Micrometer μm

10. Express the following numbers in scientific notation with the correct number of significant figures:

- a. 9,457 9.457×10^3
- b. 0.00007 7×10^{-5}
- c. 20,000,000,000 2×10^{10}
- d. 0.012345 1.2345×10^{-2}
- e. 652.38 6.5238×10^2

11. Carry out the following calculations, express the answers to the correct numbers of significant, and include units in your answers.

- a. 5280 ft/mi X 6.2 mi 850 ft (round down from 851.6)
- b. 4.5 m X 3.25 m 15 m^2 (round down from 14.625)
- c. 2.50 g ÷ 8.3 g/cm³ 0.30 cm^3 (round from 0.3012)
- d. 4.70 cm + 6.8 cm - 2.543 cm 9.0 cm (round from 8.957)

12. Carry out the following conversions. Consult your notebook for conversion standards

- a. 3.614 mg to grams 0.003614 g
- b. 56.4 mi to kilometers 90.8 km
- c. 14.4 μm to millimeters 0.0144 mm
- d. 6.03×10^{-6} cg to nanograms 60.3 ng
 $0.00000603 \text{ cg} \times \frac{10 \text{ mg}}{1 \text{ cg}} \times \frac{1000 \text{ μg}}{\text{mg}} \times \frac{1000 \text{ ng}}{\text{μg}}$
- e. 2.0 L to quarts 2.1 quarts

13. The muzzle velocity of a bullet fired from a 9mm handgun is 1200 ft/s.

a. How many miles per hour is this?

$$\frac{1200 \text{ ft}}{1 \text{ sec}} \times \frac{60 \text{ sec}}{1 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{1 \text{ mi}}{5280 \text{ ft}} = \frac{818 \text{ mi}}{\text{hr}}$$

b. If the bullet travels 24 ft before it strikes the target, how long will it take the bullet to get there?

$$24 \text{ ft} \times \frac{1 \text{ sec}}{1200 \text{ ft}} = 0.02 \text{ sec}$$

14. A normal value for blood cholesterol is 200 mg/dL of blood. If a normal adult has a total blood volume of 5L, how much total cholesterol is present?

Need units to match →

$$\frac{200 \text{ mg}}{\text{dL}} \times \frac{10 \text{ dL}}{1 \text{ L}} = \frac{2000 \text{ mg chol.}}{1 \text{ L blood}}$$

$$5 \text{ L} \times \frac{2000 \text{ mg}}{1 \text{ L}} = 10,000 \text{ mg cholesterol}$$

15. To the correct number of significant figures, record the measurement below:



11.64 cm 4 sig figs
↳ Estimated Measurement



16. How many significant figures are in each of the following:

a. 14,397

5

b. 25.6

3

c. 1064

4

d. 10430

4 or 5

e. 0.00001

1

f. 0.110

3