Review Sheet: Unit 2 **Name** KEY

I. Fill in the blanks

Physical properties can be observed without chemically changing matter. _Chemical_ properties describe how a substance interacts with other substances. _Solids_ have definite shapes and definite volumes. _Liquids_ have indefinite shapes and definite volumes. _Gases_ have indefinite shapes and indefinite volumes.

Phase changes are _physical_ changes. _Freezing_ point is the temperature at which a liquid turns to a solid. It is also equal to the _melting_ point which is the temperature at which a _solid_ turns to a _liquid_. _Boiling_ point is the temperature at which a liquid turns to a gas, and _condensation_ point is the temperature at which a gas turns to a liquid. Occasionally, a solid turns directly into a gas without turning into a liquid first. This is called _sublimation_.

A(n) _element_ is a pure substance that is made of only one kind of atom. The symbol for a(n) _element_ is always one or two letters. When the symbol contains two letters, the first letter is always _uppercase_, and the second letter is always _lowercase_.

A(n) _compound_ is a pure substance containing two or more elements that are _chemically_ combined. A(n) _compound_ is represented by a chemical _formula_. The elements in a(n) _compound_ always combine in _definite (the same)_ proportions.

A(n) _mixture_ is made of two or more substances that are _physically_ combined. A(n) _mixture_ that is uniformly mixed is called _homogeneous_. A special name for this is a(n) _solution_. A(n) _mixture_ that is not uniformly mixed is called _heterogeneous_. A special type of mixture that is a solid _solution_ of two or more metals is called a(n) _alloy_.

The property used to separate a mixture of sand and iron filings is _____magnetism_____. The technique used to separate liquids based on boiling points is called _____distillation_____. The spinning machine used to separate mixtures based on densities is a _____centrifuge_____.

Density describes the relationship between the _____mass_____ and _____volume_____ of a sample of a substance. The most common units for density are _____g/mL_____ and _____g/cm^3_____. The density of water is _____1.0 g/mL (g/cm^3)_____.

II. Classify each of the following properties/changes as chemical (C) or physical (P).

combustibility	C	getting a haircut	P
flammability	C	tendency to corrode	C
weight	P	crushing rocks	P
tearing paper	P	boiling point	P
ductility	P	odor	P
texture	P	malleability	P
digestion of food	C	fire works exploding	C
density	P	lighting a candle	C
evaporation	P	tarnishing silver	C
ice cube melting	P	formation of acid rain	C
volume	P	dissolving salt in water	P

III. Classify each of the following as an element (E), compound (C), homogeneous mixture/solution (S), or heterogeneous mixture (HE).

chocolate chip cookie	HE	carbon dioxide	C
oxygen gas	E	water	C
salt water	S	iced tea	S
taco	HE	rust (iron oxide)	C
gold	E	muddy water	HE
potassium	E	bronze	S
graphite	E	copper	E
air	S	salad dressing	HE

IV. Show all work as you complete the following problems.

Given a mass of 24 grams and a volume of 3 milliliters, calculate the density.

$$D = \frac{m}{V} = \frac{24\ g}{3\ mL} = \boxed{8\ \frac{g}{mL}}$$

What is the mass of 32 milliliters of water?

$$m = D \times V = 1.0\ \frac{g}{\cancel{mL}} \times 32\ \cancel{mL} = \boxed{32\ g}$$

Given that the density of iron is 7.9 grams per centimeters cubed, what would be the volume of a 3.5 gram piece of iron?

$$V = \frac{m}{D} = \frac{3.5\ \cancel{g}}{7.9\ \frac{\cancel{g}}{cm^3}} = \boxed{0.44\ cm^3}$$

Find the density of a block with a length of 5.0 centimeters, a width of 2.0 centimeters, a height of 1.0 centimeter, and a mass of 45 grams.

$$V = 5.0\ cm \times 2.0\ cm \times 1.0\ cm = 1.0 \times 10^1 cm^3 \qquad D = \frac{m}{V} = \frac{45\ g}{1.0 \times 10^1\ cm^3} = \boxed{4.5\ \frac{g}{cm^3}}$$

Find the density of an 8-gram rock if the water in a graduated cylinder rises from 25.0 milliliters to 29.0 milliliters when the rock is placed into the graduated cylinder.

$$V = 29.0\ mL - 25.0\ mL = 4.0\ mL = 4.0\ cm^3 \qquad D = \frac{m}{V} = \frac{8\ g}{4.0\ cm^3} = \boxed{2\ \frac{g}{cm^3}}$$

You have a piece of silver with a mass of 42.8 grams. Silver has a density of 10.5 grams per centimeter cubed. What would be the new level of water if this piece of silver were placed into 25.0 milliliters of water?

$$V = \frac{m}{D} = \frac{42.8\ \cancel{g}}{10.5\ \frac{\cancel{g}}{cm^3}} = 4.08\ cm^3 = 4.08\ mL \qquad V = 25.0\ mL + 4.08\ mL = \boxed{29.1\ mL}$$

The density of iron is 7.0 g/cm^3. What volume of iron would have a mass of 14.0 g?

$$V = \frac{m}{D} = \frac{14.0\ \cancel{g}}{7.0\ \frac{\cancel{g}}{cm^3}} = \boxed{2.0\ cm^3}$$