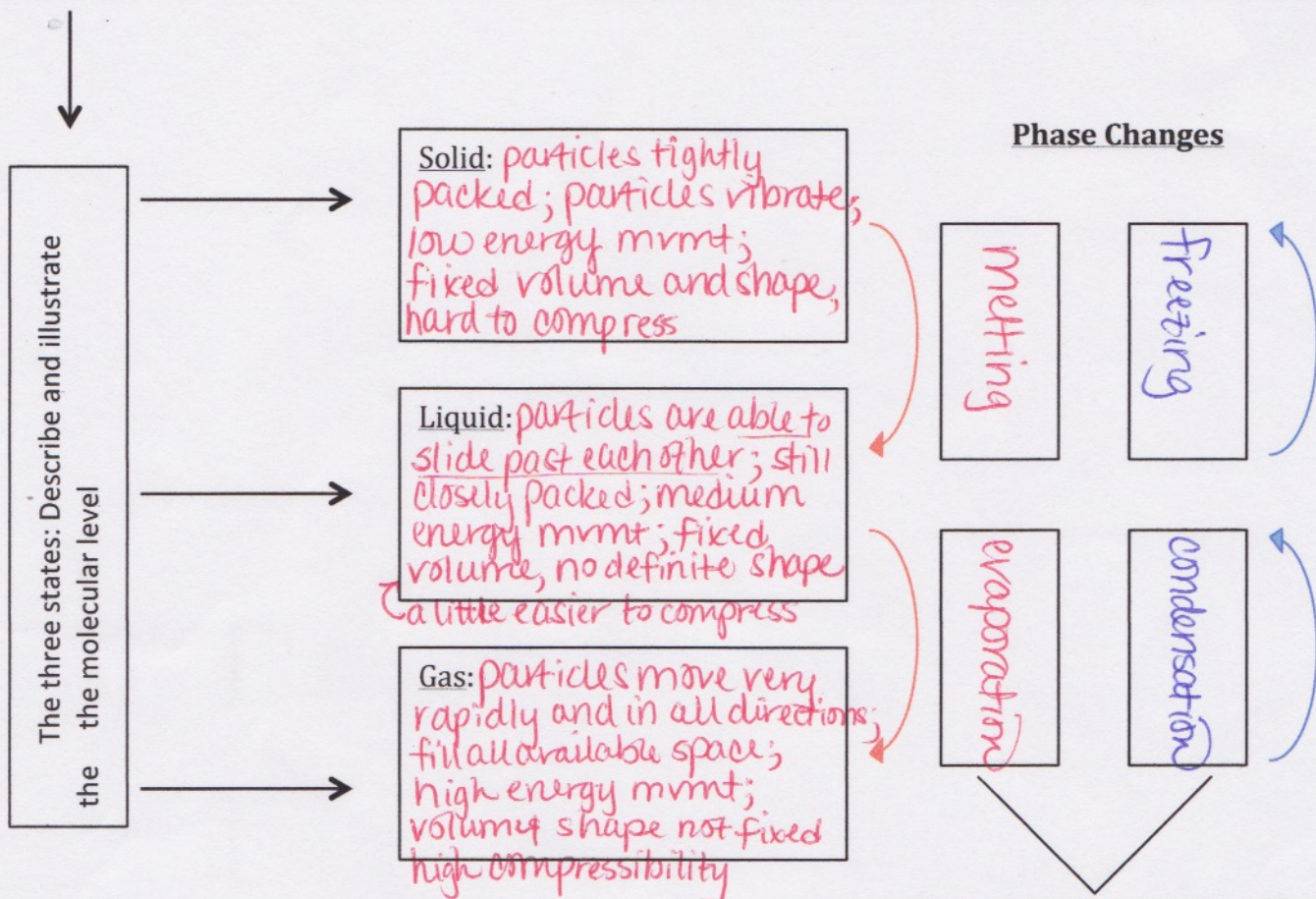
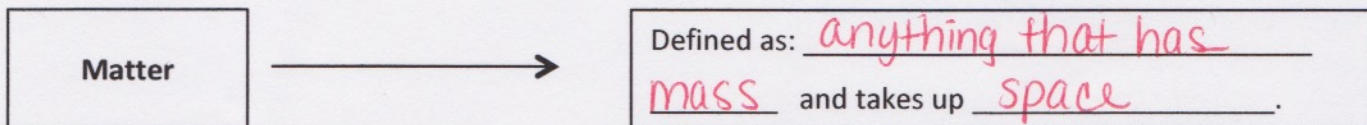


Name Key

Assessment Review Practice



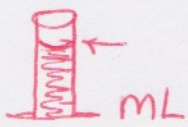
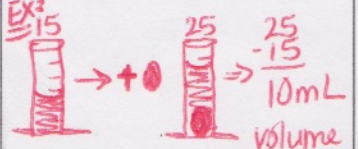
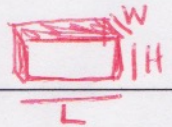
Description of the phase changes:

Melting Point = freezing Point

Evaporation = Condensation

Deposition = sublimation

Volume - Three Methods to determining the Volume of an object or substance:

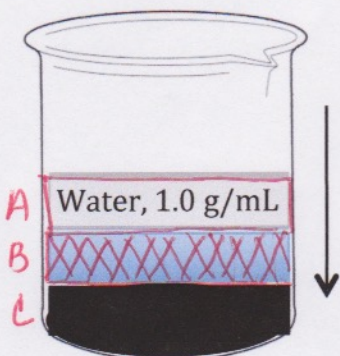
	Liquid	Irregular Shape Object	Cube
Explanation or Description of the Method Used	Using a graduated cylinder, measure the volume	Measure a specific amount of water in to a graduated cylinder. Drop object in, and take the difference in the water levels.	measure & multiply $L \times W \times H$ in cm.
Image/Illustration of the method.			

an example

Density - Definitions, Examples, and Practice Calculations:

Definition - the amount of matter per space occupied

Example:



Describe the densities of the liquids in the beaker to the right. Be sure to discuss the amount of matter within the given volume of the liquid. Liquid A has the least amount of mass given the volume occupied; liquid B has more mass/volume than water therefore it is located below the water; liquid C has the most mass/volume in comparison to the other two liquids, therefore it is at the bottom.
mass = amount of matter in an object.

Practice Problems:

1. A graduated cylinder has a mass of 50 g when empty. When 30 mL of water is added, the graduated cylinder has a mass of 120 g. If a rock is added to the graduated cylinder, the water level rises to 75 mL and the total mass is now 250 g. What is the density of the rock?



$$D = \frac{m}{V}$$

$$V = 75 - 30 = 45 \text{ mL}$$

$$m = 250 - 120 = 130 \text{ g}$$

$$\frac{130 \text{ g}}{45 \text{ mL}} = D = 2.89 \text{ g/mL}$$

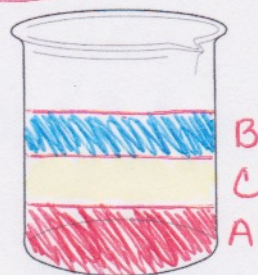
2. A student performs an experiment with three unknown fluids and obtains the following measurements:

Fluid A: $m = 2060 \text{ g}$, $V = 2000 \text{ mL}$ (color red)

Fluid B: $m = 672 \text{ g}$, $V = 850 \text{ mL}$ (color blue)

Fluid C: $m = 990 \text{ g}$, $V = 1100 \text{ mL}$ (color yellow)

$$D = \frac{m}{V}$$



Draw how the fluids would be layered if they were combined in a beaker.

Density calculations:

$$A: \frac{m}{V} = \frac{2060 \text{ g}}{2000 \text{ mL}} = 1.03 \text{ g/mL}$$

$$B: \frac{672}{850} = 0.79 \text{ g/mL}$$

$$C: \frac{990}{1100} = 0.9 \text{ g/mL}$$

3. A solid magnesium flare has a mass of 1300 g and a volume of 743 cm^3 . What is the density of the magnesium?

$$D = \frac{m}{V} = \frac{1300 \text{ g}}{743 \text{ cm}^3} = 1.75 \text{ g/cm}^3$$

4. Use your density calculation skills to find the identity of the following mystery objects.

Table of Densities			
Equivalents $\Rightarrow 1 \text{ mL} = 1 \text{ cm}^3$			
Solids	Density g/cm^3	Solids	Density g/cm^3
Marble	2.56	Copper	8.92
Quartz	2.64	Gold	19.32
Diamond	3.52	Platinum	21.4



(displacement method)

While digging in the backyard, you find an old coin. Its mass is 26.76 g and its volume is 3 mL.

$$D = \frac{m}{V} = \frac{26.76 \text{ g}}{3 \text{ mL}} = 8.92 \text{ g/mL}$$

or 8.92 g/cm^3

What is the coin made of?

Copper

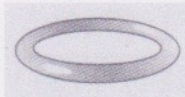


You think you have found a diamond. Its mass is 5.28 g and its volume is 2 cm^3 .

$$D = \frac{m}{V} = \frac{5.28 \text{ g}}{2 \text{ cm}^3} = 2.64 \text{ g/cm}^3$$

What did you find?

Quartz



You find a ring with a mass of 107 g. You fill a graduated cylinder up with 10 mL of water and put the ring into the cylinder. The water rises up to the 15 mL mark.

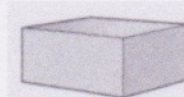
$V = 15 - 10$
 $V = 5 \text{ mL}$
 (displacement method)

$$D = \frac{m}{V} = \frac{107 \text{ g}}{5 \text{ mL}} = 21.4 \text{ g/mL}$$

or 21.4 g/cm^3

What is the ring made of?

Platinum



There is a block on your desk that acts as a paperweight. Its measurements are 3 cm by 4 cm by 6 cm. The block has a mass of 184.32 g.

$V = l \times w \times h$
 $V = 3 \times 4 \times 6 = 72 \text{ cm}^3$

$$D = \frac{184.32 \text{ g}}{72 \text{ cm}^3} = 2.56 \text{ g/cm}^3$$

What is the block made of?

Marble

Physical and Chemical Properties:

Physical Properties - a characteristic of a substance that can be observed w/o changing the substance into another substance.

Ex: mass, volume, size, color, density, melting/freezing pt, solubility

Chemical Properties - a characteristic that can only be observed by changing it into a different substance or creating a new substance.

Ex: combustibility, flammability, rust, decompose, reacts w/ other chemicals

Decide whether the following is an example of a physical or chemical change. Provide evidence for your decision.

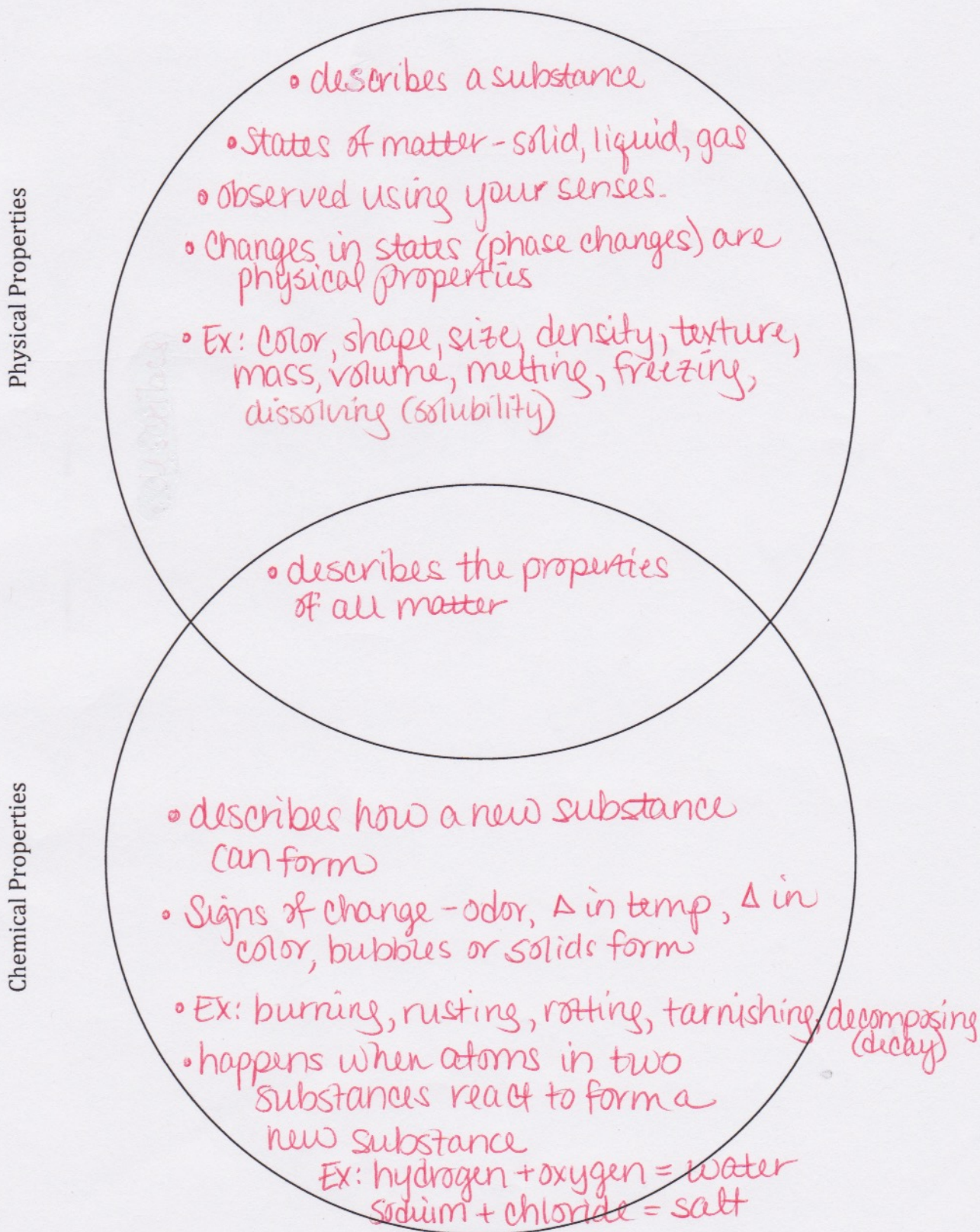
1. A copper pot turned green when exposed to the environment. Chemical Δ - tarnishing is an example of a chemical change
2. Diamonds are a very hard substance that can cut through glass. physical Δ /property - hardness is a description of its physical properties and does not produce a new substance
3. Sodium reacts very easily with other elements. chemical property / Δ - the ability to react w/other substances is a chemical property / Δ , and produces a new substance.
4. Barium melts at 725°C . Melting is a phase change in a state of matter. It is still barium, no new substance. A phase change is a physical change.
5. Iron reacts with oxygen and forms rust. Rusting is a chemical change because the bonds btwn the atoms were broken or new ones formed. A new substance was produced - Rust.
6. The boiling point of water is 100°C . Boiling point is a description of its physical properties, a change in a state of matter from a liquid to a gas.
7. Acid in tomato sauce can corrode aluminum foil. Corroding aluminum foil is a chemical change causing a change/new substance to be produced - a different metal can get into the food.
8. A bar of lead is more easily bent than is a bar of aluminum of the same size. Changing its shape is a physical property. It is still the same substance, just bent into a new shape.

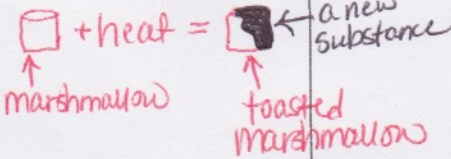
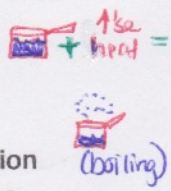
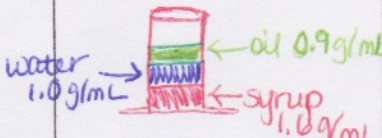
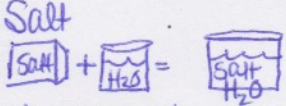
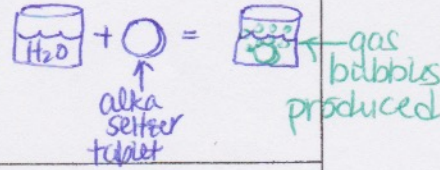
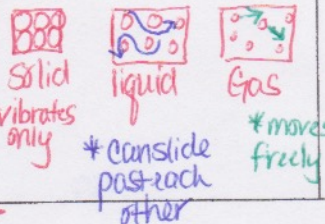
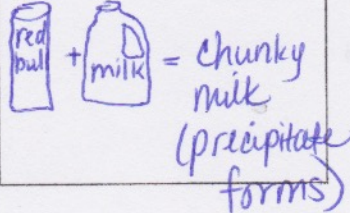
Read each of the following and describe what state of matter or phase of matter the molecules are in.

1. The molecules of a substance are moving rapidly in a container. The molecules do not interact with each other. If the container is opened, the molecules will escape from the container. In what phase of matter are the molecules in the container? gas
2. At the same temperature and pressure, which state of matter has the highest density? Solid
3. What must be added to water in order to change state from liquid to a gas? heat must be added, resulting in an increase in molecular (particle) movement because of an increase in energy (kinetic).

4. When a substance such as ice melts, its temperature increases. Describe what happens to the arrangement of the water molecules as the temperature increases. the molecules move farther apart, and are able to move (slide past each other) or move rapidly (as in a gas) (as in a liquid)

Complete the following Venn diagram on Physical and Chemical Properties of Matter:



Physical Property Characteristics		Chemical Property Characteristics	
Example	Image/Drawing	Example	Image/Drawing
Color	Red Green Blue	Flammability (burns)	 marshmallow + heat = toasted marshmallow ← a new substance
Melting Freezing Boiling Condensation Evaporation	 ↑ heat = (boiling) 0°C → increasing in temp = melting 0°C ← decreasing in temp = freezing	Reactivity (ability to combine or react)	Sodium (Na) + Chloride (Cl) = table salt (NaCl)
Density	 water 1.0 g/mL ← oil 0.9 g/mL ← syrup 1.4 g/mL more mass/volume = density	Rusting	When metals turn "reddish orange" and are able to flake off.
Solubility (dissolves in water)	 Salt + H₂O = Salt H₂O * if left out the water would evaporate leaving the salt behind	Gas Produced/Fizzing	 H₂O + alka seltzer tablet = gas bubbles produced
Hardness/Texture	- Can it bend? - Is it rough? - Smooth? - etc.	Tarnishing	to become dulled or discolored because it is exposed to air
Luster	Shiny? Dull?	Color/Odor Change	Baking Soda (white powder) + H ₂ O + iodine = purple liquid white liquid
State of Matter/Phase Change	 Solid: vibrates only Liquid: can slide past each other Gas: moves freely ↑ Solid → liquid = melting	Precipitate Forms (a solid)	 Red Bull + milk = chunky milk (precipitate forms)