Unit 7 (Ch. 2 &3) Matter Review --- Answer Key **January 2014** **Physical Science**

1. ***Define the following terms.***
   a. Matter: Anything that has mass and takes up space; matter is made up of atoms.
   b. Element: A pure substance that cannot be further broken down (i.e. Hydrogen, Carbon)
   c. Atom: The smallest particle of matter. Atoms make up elements.
   d. Compound: A pure substance that is made of two or more elements and can be broken down into these (i.e. H_20)
   e. Homogeneous Mixture: A classification of matter that is variable in which all the parts look the same (i.e. Kool-aid)
   f. Heterogeneous Mixture: A classification of matter that is variable in which you can distinguish between the different parts (i.e. sand and water; salad dressing)

2. Classification of Matter ***Label each of the following as an element, compound, homogeneous mixture or a heterogeneous mixture.***
   a. A substance that cannot be broken down into simpler substances Elem
   b. A combination of two or more substances Compound
   c. Can be broken down chemically into elements Compound
   d. Pizza Heterogeneous
   e. Pure air Homogeneous
   f. Sugar Comp
   g. Kool-aid Homo
   h. Hydrogen Elem
   i. Beach Sand Hete
   j. Flat Soda Homo

3. ***Describe each of the following as chemical or physical changes.***
   a. Wood burning Chemical
   b. Ice melting Physical
   c. Changing shape Physical
   d. Pounding metal into a shape Phys
   e. Water evaporating Physical
   f. Forming a precipitate Chemical
   g. Cooking a cake Chemical
   h. Rusting a nail Chemical
   i. Forming a gas Chemical
   j. Grinding rocks into sand Physical
   k. Dissolving salt in water Physical
   l. Digesting food Chemical

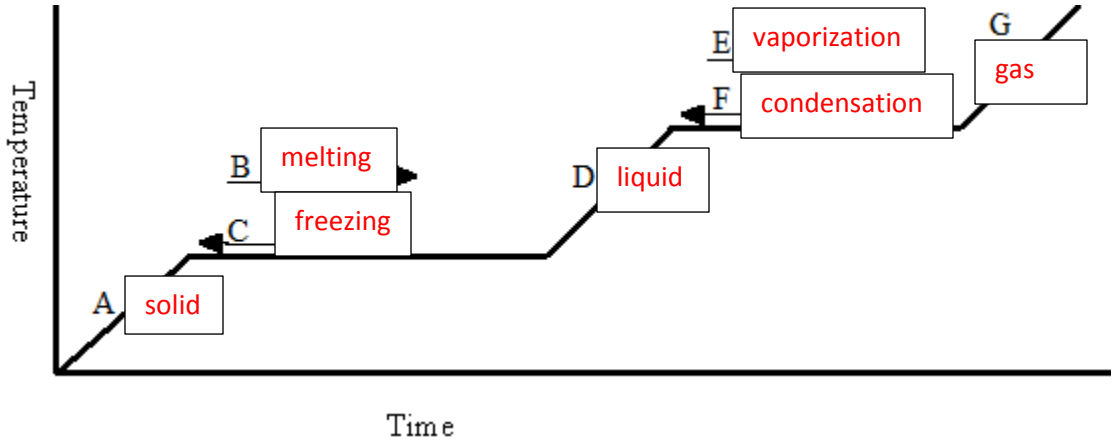
4. Phases/States of Matter
   a. What do all changes in state of matter require? **Energy**
   b. During a physical or chemical change energy may **be absorbed (endothermic) or released (exothermic)**.
   c. What state of matter has indefinite shape and indefinite volume? **gas**
   d. What state of matter has definite shape and definite volume? **solid**
   e. What state of matter has indefinite shape and definite volume? **liquid**
   f. In what state of matter do the atoms vibrate in a fixed position? **solid**
   g. In which state of matter can the forces of attraction among the particle are so weak that they can be ignored? **gas**
   h. What phase of matter is hydrogen in at -255 °C? **liquid**
   i. What phase of matter is Acetic acid in at 0 °C? **solid**
   j. What substances are gases at -100 °C? **Hydrogen & Nitrogen**
   k. What substances are solid at -100 °C? **Acetic Acid & Gold**
   l. What is the freezing point of Gold? **1064.2°C**
   m. What is the condensation point of Nitrogen? **-195.8°C**
   n. What state of mater has the highest molecular movement? **plasma**

Melting and Boiling Points of Some Substances

Substance	Melting Point	Boiling Point
Hydrogen	–259.3°C	–252.9°C
Nitrogen	–210.0°C	–195.8°C
Acetic Acid	16.6°C	117.9°C
Gold	1064.2°C	2856°C

o. What state of mater has the lowest molecular movement? **solid**

p. Label each of the phases and phases changes occurring in the graph below



5. Phase Changes

a. As a sample of matter is heated what happens to the particles? **The particles will move more quickly (faster).**

b. During a phase change what happens to the temperature? **The temperature stays constant (remains the same).**

c. **MELTING** is when an object goes from a solid to a liquid

d. **VAPORIZATION** is when an object goes from a liquid to a gas

e. **SUBLIMATION** is when an object goes from a solid to a gas without become a liquid first

f. **DEPOSITION** is when an object goes from a gas to a solid without become a liquid first

g. **CONDENSATION** is when an object goes from a gas to a liquid

h. **FREEZING** is when an object goes from a liquid to solid

6. Gas Laws

a. Describe Boyle's Law: when temperature is held constant, pressure and volume of a gas are directly proportional

b. Describe Charles's Law: when pressure is held constant, temperature and volume of a gas are indirectly proportional (opposite)

c. Describe Lussac's Law: when volume is held constant, temperature and pressure of a gas are directly proportional.

d. Which law says that as the temperature of a gas decrease the pressure will decrease if the volume is constant?

Lusaac's Law

e. Which law says if you decrease the volume of a container of gas then the pressure will increase if the temperature remains constant? **Boyle's Law**

f. Which law says that if pressure is constant an increase in temperature will cause an increase in volume?

Charles's Law

g. If temperature increases volume **INCREASES** if pressure is constant.

h. If pressure decreases volume **INCREASES** if temperature is constant.

i. If the temperature decreases pressure **DECREASES** if volume is constant.

j. If temperature decreased volume **DECREASES** if pressure is constant.

k. If pressure increases volume **DECREASES** if temperature is constant.

l. If the temperature increases pressure **INCREASES** if volume is constant.