Name: _____ Period: _____ Date: _____

GASES NOTES
HONORS CHEMISTRY

Directions: This packet will serve as your notes for this chapter. Follow along with the PowerPoint presentation and fill in the missing information. Important terms / ideas are in all capitals and bolded!

- Characteristics of Gases

    1) Gases consist of hard, _____ particles (atoms or molecules)

    2) Particles are _____ and do have _____

    3) Large amounts of _____

    4) Easily _____ and _____

    5) Move _____ and _____

- Kinetic Theory of Gases

    -Explains the _____ of gases and why they _____ the way they do…

    CONSTANT _____ WHICH IS _____ AND _____ (ALLOWS FOR COMPRESSIBILITY AND PRESSURE) WITH _____!!

- **GAS PRESSURE:**

    -Due to simultaneous _____ of _____ of rapidly moving particles

    -**BAROMETER:**

    -Atmospheric pressure exists due to the _____ exerted by _____ molecules striking other objects

- Units of Pressure

$$1 \text{ atm} = \text{_____ mm Hg}$$

$$1 \text{ atm} = \text{_____ torr}$$

$$1 \text{ atm} = \text{_____ kPa}$$

$$STP = \text{\_\_\_\_\_ °C and \_\_\_\_\_ atm}$$

    -Example: Express _____ mm Hg in atm.

- Gas Laws

  -Factors including _____, _____, _____, and _____ will affect a gas

  -How a gas will _____ to these changes can be predicted using certain _____

- **BOYLE'S LAW**

                    Pressure _____, then volume _____
                              (_____ relationship)

  -Equation:

  -Real World Examples:

  -Example: A balloon is filled with _____ L of air at _____ atm pressure. If the pressure is changed to 1140 mm Hg, what is the new volume?

- **CHARLES' LAW**

                    Volume _____, as the temperature _____
                              (_____ relationship)

  -Equation:

  -Real World Examples:

  -Example: What is the temperature of a gas expanded from _____ L at 25°C to _____ L at constant pressure?

- **GAY-LUSSAC'S LAW**

    Pressure _____, as the temperature _____
                    (_____ relationship)

    -Equation:

    -Real World Examples:

    -Example: What is the pressure inside a 0.250 L can of deodorant that starts at _____°C and 1.2 atm if the temperature is raised to _____°C?

- **COMBINED GAS LAW**

    Boyle's, Charles', and Gay-Lussac's Laws _____!

    -Equation:

    -Example: A _____ L cylinder of gas at 486 kPa pressure and _____°C is heated to 75°C and compressed to _____ atm. What is the new volume?

- Practice

    -Example: Bacteria produce methane gas in sewage-treatment plants. If a bacterial culture produces _____ mL of methane gas at 700.0 mm Hg, what volume (in L) would be produced at 760.0 mm Hg?

-Example: A pressure cooker raises the temperature of its contents by keeping the contents under pressure. The volume of the cooker is 4.0 L. Steam at 100.0°C and 1.00 atm usually cooks the food. If the cooker is placed at _____ atm, what will the temperature of the steam be in °C?

- **IDEAL GAS LAW**

Includes all _____ factors that can affect a gas!

-Equation:

n =

R =

-**IDEAL GAS**: follows gas laws at _____ conditions of pressure and temperature… assumes particles have no _____ and no attractive forces (These don't really _____!)

-**REAL GAS**: have _____ and attract to each other and will only be ideal at very _____ pressures or _____ temperatures

-Limitations of the Ideal Gas Law:

1) Works well at _____ pressures and _____ temperatures (that's when real gases act ideally)

2) Most gases do not behave ideally above _____ pressure

3) Does not work well near _____ conditions of a gas

   *Ideal gases don't _____ because molecules do take up _____ and attractive forces exist otherwise _____ would not form… _____ easier and close approximation so we assume gases are ideal!

-Example: Determine the volume occupied by _____ grams of carbon dioxide gas at STP.

-Example: If I have _____ moles of a gas held at a temperature of _____°C and in a container with a volume of 45,000 mL, what is the pressure of the gas?

- **DALTON'S LAW**

  Total pressure of a _____ of gases is equal to the _____ of the
  _____ of the component gases!

  -Equation:

  -Example:

  -Example: N_2, He, Ne, and Ar are placed into a container. The partial pressures of each are as
  follows: N_2 = _____ kPa, He = 73 kPa, Ne = _____ kPa and Ar = 108 kPa. What is the total pressure
  in the container?

- Diffusion vs. Effusion

  -**DIFFUSION**: gas molecules will _____ to fill an area until the _____ are
  _____ spread out

  -**EFFUSION**: when a gas is confined to a _____ that has a _____,
  molecules will _____ encounter the _____ and pass through it

  -**GRAHAM'S LAW OF EFFUSION**: Rate at which a gas will effuse is _____
  proportional to the _____ of the gas's _____

  o Equation:

  ***When comparing effusion rates for gases… the _____ the molar mass, the
  _____ the gas will effuse!!!**