Name:_____   Period:_____   Date:_____

CHAPTER 10 NOTES
10.3: The Gas Laws

1. Define **gas laws:**

2. **What units** do the following measurements need to be in to describe gases?

   a. Temperature –

   b. Volume –

   c. Pressure -

Boyle's Law

3. Looking at the data table on page 314, <u>describe the relationship</u> between pressure and volume (include whether this is a direct or indirect proportionality).

4. Use the kinetic-molecular theory to explain what Boyle saw when he experimented with the relationship between pressure and volume.

5. Define Boyle's Law in words.

6. Write the equation for Boyle's Law (use the one that compares changing conditions for a gas at the bottom of page 314).

7. Think of a situation in "real life" that exemplifies Boyle's Law and explain it below.

8. **Example Problem:** A balloon filled with helium gas has a volume of 500 mL at a pressure of 1 atm. The balloon is released and reaches an altitude of 6.5 km, where the pressure is 0.5 atm. Assuming that the temperature has remained the same, what volume does the gas occupy at this height?

Charles's Law

9. Looking at the data table on page 317, <u>describe the relationship</u> between temperature and volume (include whether this is a direct or indirect proportionality).

10. Explain (or draw) how a hot air balloon is a good example of this relationship.

11.

    a. What is absolute zero?

    b. Why is it REALLY IMPORTANT that all temperature values are in KELVIN when describing gas laws?

    c. How do you convert between Kelvin and Celsius?

12. Define Charles's Law in words.

13. Write the equation for Charles's Law (use the one that compares changing conditions for a gas at the bottom of page 318).

14. **Example Problem:** A helium-filled balloon has a volume of 2.75 L at 20 °C. The volume of the balloon decreases to 2.46 L after it is placed outside on a cold day. What is the outside temperature?