Chapter 10 Pretest Name _____
States of Matter

Section 10.1: The Nature of Gases

1. Use kinetic theory to explain how the pressure inside a car tire changes as a function of the air temperature outside the tire.

2. How would the reading on a barometer change if you were to take one on a trip from the Pacific Ocean to Lake Tahoe, which is high in the mountains?

3. The height of a column of mercury in a barometer is 754.3 mm. What is the atmospheric pressure in atm? In kPa?

4. How does the average kinetic energy of the helium molecules in a balloon change as the helium gas is heated from –100.0°C to 73°C?

Section 10.2: The Nature of Liquids.

1. In general, how do the strengths of the intermolecular forces between gas particles compare with those between liquid particles?

2. Imagine an open beaker filled with an aqueous solution of KCl. How can a dynamic equilibrium be established between the liquid and the vapor forming above the surface?

3. Explain how the following description is an analogy for evaporative cooling: If the fastest runner is removed from a race, the resulting average speed of the runners that remain will be lower.

4. A pressure cooker is a pot that can cook food by boiling water at higher temperature than could be obtained at normal atmospheric pressure. How does increasing the external pressure make it possible to cook at higher temperature?

Section 10.3: The Nature of Solids

1. How does the crystalline structure of graphite compare with that of diamonds?

2. Why is diamond classified as an allotrope of carbon?

3. Peanut brittle is a candy that is poured out while hot onto a surface. It is allowed to cool and harden into a sheet, which easily breaks into irregularly shaped pieces. The sugar in peanut brittle solidifies without reforming its crystal lattice. What type of solid is peanut brittle?

4. Which type of solid is likely to have the lowest melting point—an ionic solid or a molecular solid? Explain.

5. Give an example of a crystalline solid. What is a crystal?

Section 10.4: Changes of State
(To answer the following questions, refer to the phase diagram shown in Figure 10.18 of your textbook.)

1. How does the melting point of water change as the pressure increases from 1 atm?

2. What does the line separating the solid phase from the gas phase represent?

3. What does the line separating the liquid phase from the gas phase represent?

4. What is the vapor pressure of liquid water at 100°C?