Name _____ Date _____ Class _____

SECTION 15-3 SECTION SUMMARY

Air Pressure

Guide for Reading

- **What are some of the properties of air?**
- **What instruments are used to measure air pressure?**
- **How does increasing altitude affect air pressure and density?**

Air consists of atoms and molecules that have mass. Therefore, air has mass. Because air has mass, it also has other properties, including density and pressure. The amount of mass per unit volume of a substance is called the density of the substance. The force per unit area is called pressure. Air pressure is the result of the weight of a column of air pushing down on an area. The molecules in air push in all directions. This is why air pressure doesn't crush objects.

Falling air pressure usually indicates that a storm is approaching. Rising air pressure usually means that the weather is clearing. A barometer is an instrument that measures changes in air pressure. There are two kinds of barometers: mercury barometers and aneroid barometers. A mercury barometer consists of a glass tube open at the bottom end and partially filled with mercury. The open end of the tube rests in a dish of mercury, and the space above the mercury in the tube contains no air. The air pressure pushing down on the surface of the mercury in the dish is equal to the weight of the column of mercury in the tube. At sea level, the mercury column is about 76 centimeters high, on average. An aneroid barometer has an airtight metal chamber that is sensitive to changes in air pressure. The thin walls of the chamber flex in and out as air pressure changes, and the movements are recorded on a dial.

In weather reports, air pressure usually is given in inches of mercury. National Weather Service maps indicate air pressure in millibars. One inch of mercury equals 33.87 millibars.

Altitude, or elevation, is the distance above sea level. Air pressure decreases as altitude increases. As air pressure decreases, so does density. Sea-level air has the weight of the whole atmosphere pressing on it, so air pressure is highest at sea level. Air pressure is much lower at the tops of mountains. There the low density of air can make it hard to breathe because there is less oxygen in each cubic meter of air.

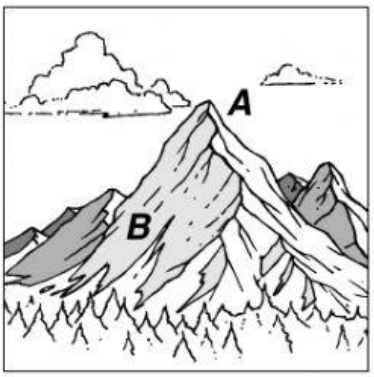
Name _____ Date _____ Class _____

SECTION 15-3 REVIEW AND REINFORCE

Air Pressure

◆ Understanding Main Ideas

Study the figure below, and then complete the following statements.



1. Altitude is greater at point _____.
2. Air pressure is greater at point _____.
3. Density of the air is greater at point _____.
4. A cubic meter of air has less mass at point _____.
5. The percentage of oxygen in the air at point A is _____ percent.

Answer the following questions on a separate sheet of paper.

6. State three properties of air.
7. Why doesn't air pressure crush objects such as your desk?
8. What two units of air pressure are used in weather reports?

◆ Building Vocabulary

Match each term with its definition by writing the letter of the correct definition on the line beside the term.

_____ 9. air pressure

_____ 10. altitude

_____ 11. aneroid barometer

_____ 12. barometer

_____ 13. density

_____ 14. mercury barometer

_____ 15. pressure

a. the amount of mass in a unit volume of a substance
b. force per unit area
c. the result of the weight of a column of air pushing down on an area
d. any instrument that measures changes in air pressure
e. instrument that measures changes in air pressure using liquid mercury
f. the distance above sea level
g. instrument that measures changes in air pressure without using a liquid