Name _____ Date _____ Class _____

SECTION 5-1 SECTION SUMMARY

Air Pollution

Guide for Reading

- What causes photochemical smog?
- How is the ozone layer important?
- What are climate predictions based on?

Air pollution is a change to the atmosphere that has harmful effects. Substances that cause pollution are called pollutants. Air pollutants can be solid particles or gases. Particles and gases that are released into the air are called **emissions.** Most emissions are produced by human activities.

Photochemical smog is a thick, brownish haze formed when certain gases in the air react with sunlight. **The major sources of photochemical smog are the gases emitted by automobiles and trucks.** The gases react in sunlight and produce a form of oxygen called **ozone.** Pollutants are usually carried high into the atmosphere as warm air rises from Earth's surface. But during a **temperature inversion,** a layer of warm air prevents the rising air from escaping. The polluted air is trapped close to Earth's surface. Ozone in smog can cause lung problems and harm the body's defenses against infection.

Power plants and factories that burn coal and oil release gases that react with water vapor in the air, forming acids. The acids return to Earth's surface in precipitation. Precipitation that is more acidic than normal is called **acid rain.** Acid rain harms organisms and damages stone and metal.

Indoor air can be polluted, too. Substances that cause indoor air pollution include dust, pet hair, asbestos, tobacco smoke, and products with toxic fumes. Carbon monoxide is a colorless, odorless gas that forms when fuels are incompletely burned. Carbon monoxide that builds up in an enclosed space can be deadly. Radon is a colorless, odorless, radioactive gas that forms in rocks underground. Breathing radon may cause lung cancer and other health problems.

The **ozone layer** is a layer of the upper atmosphere about 30 kilometers above Earth's surface. **The ozone layer protects people from the effects of too much ultraviolet radiation.** Ozone is constantly made and destroyed in the ozone layer. During this cycle, ultraviolet energy is absorbed. But chemicals called chlorofluorocarbons, or CFCs, block the cycle that absorbs ultraviolet radiation. **Chlorofluorocarbons** are gases that contain chlorine and fluorine.

Water vapor, carbon dioxide, and certain other gases in the atmosphere let sunlight reach Earth's surface but prevent the heat from escaping back into space. The trapping of heat near Earth's surface is called the **greenhouse effect.** A theory called **global warming** predicts that an increase in carbon dioxide will cause Earth's average temperature to rise. **Most scientists base their climate predictions on computer models that calculate the effects of changes in the atmosphere.**

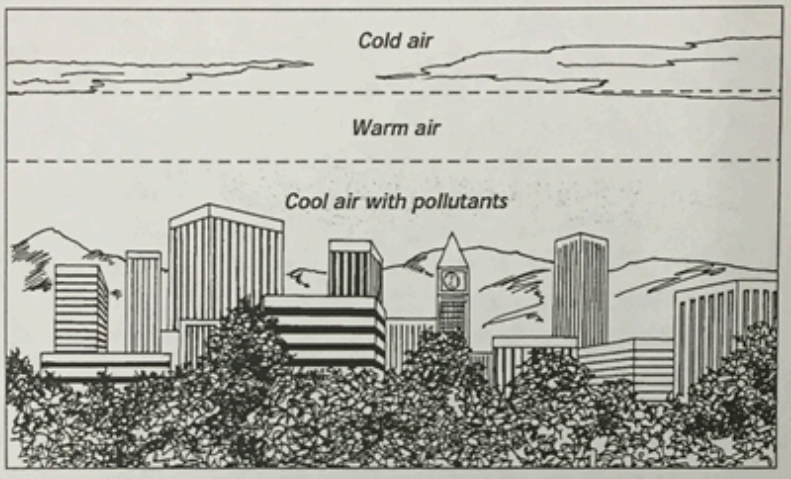
Name _____ Date _____ Class _____

SECTION 5-1 REVIEW AND REINFORCE

Air Pollution

◆ Understanding Main Ideas

Answer the following questions on a separate sheet of paper.



1. What condition is shown in the figure above? Why is this condition dangerous to people?
2. How is photochemical smog formed?
3. How is acid rain formed?
4. What are two effects of acid rain?
5. Why is carbon monoxide such a dangerous form of indoor air pollution?
6. How does the ozone layer in the atmosphere help protect people?

◆ Building Vocabulary

Define each of the following terms on a separate sheet of paper.

7. air pollution
8. emissions
9. greenhouse effect
10. global warming