Pollution of the Atmosphere Introduction

What are some sources of air pollution?

How can we ensure that everyone has clean air to breathe?

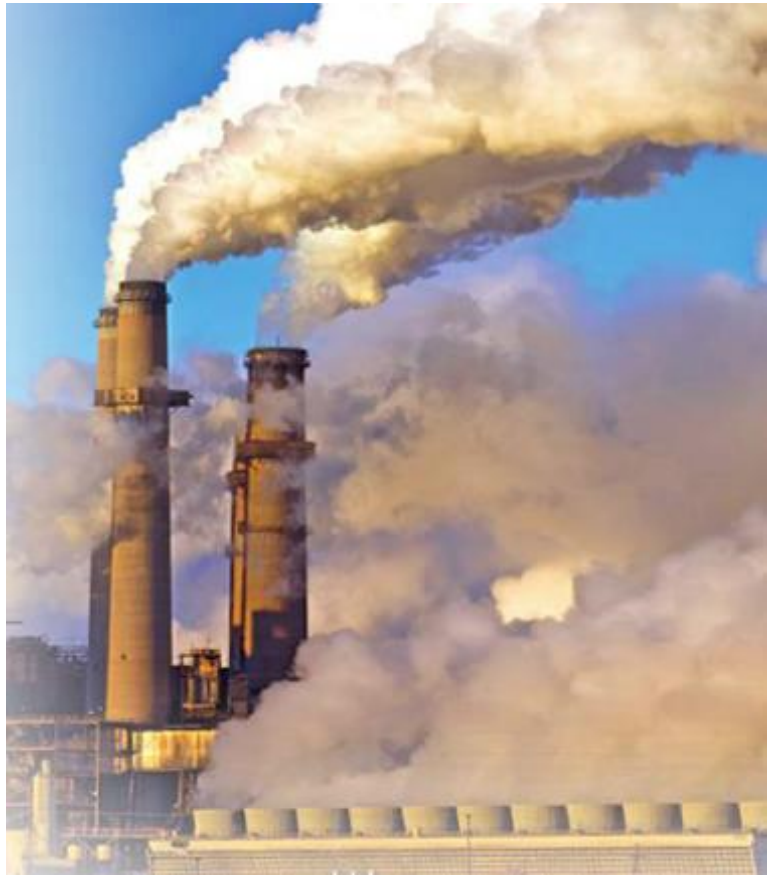
Pollution of the Atmosphere Explicit Instruction

Air pollution can be caused by natural processes and human activities.

- Natural Processes: Winds sweeping over dry land, volcanic eruptions, forest fires, etc.
- Human Sources: factory smog, car smog, etc.

Primary air pollutants are pollutants released directly into the troposphere (e.g. soot and carbon monoxide).

Secondary air pollutants are made when primary pollutants react with chemicals already in the air (e.g. ozone and sulfuric acid)



Pollution of the Atmosphere Explicit Instruction

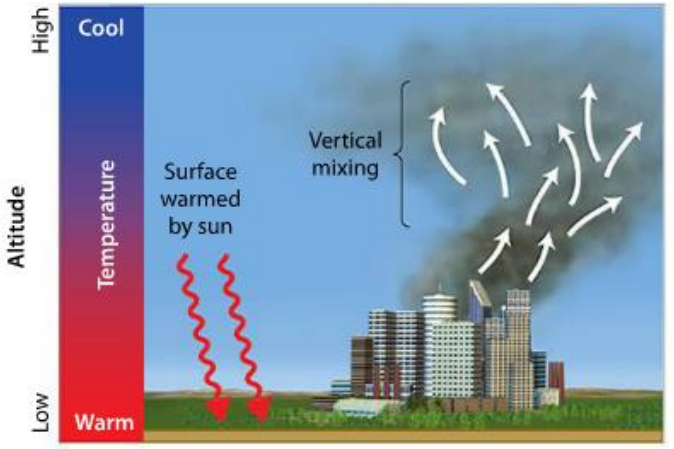
Air pollutants can damage the respiratory system, interfere in oxygen uptake, and cause cancer.

- Asthma, bronchitis and emphysema have all been linked to air pollution.
- Carbon monoxide blocks hemoglobin receptors that oxygen binds to, interfering with oxygen uptake.
- Benzene, found in gas and car exhaust, is a known carcinogen.

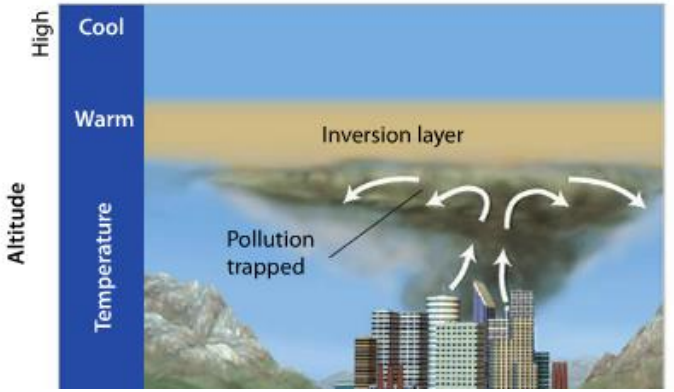
Pollution of the Atmosphere Explicit Instruction

Temperature inversions may trap smog in the stratosphere, preventing pollution from dispersing.

- Industrial smog is formed from soot, sulfur and water and produced in older industrial technologies.
- Photochemical smog is formed when sunlight reacts with nitrogen oxides and hydrocarbons.
- Temperature inversions occurs when a layer of cold air is located below a layer of warmer air.



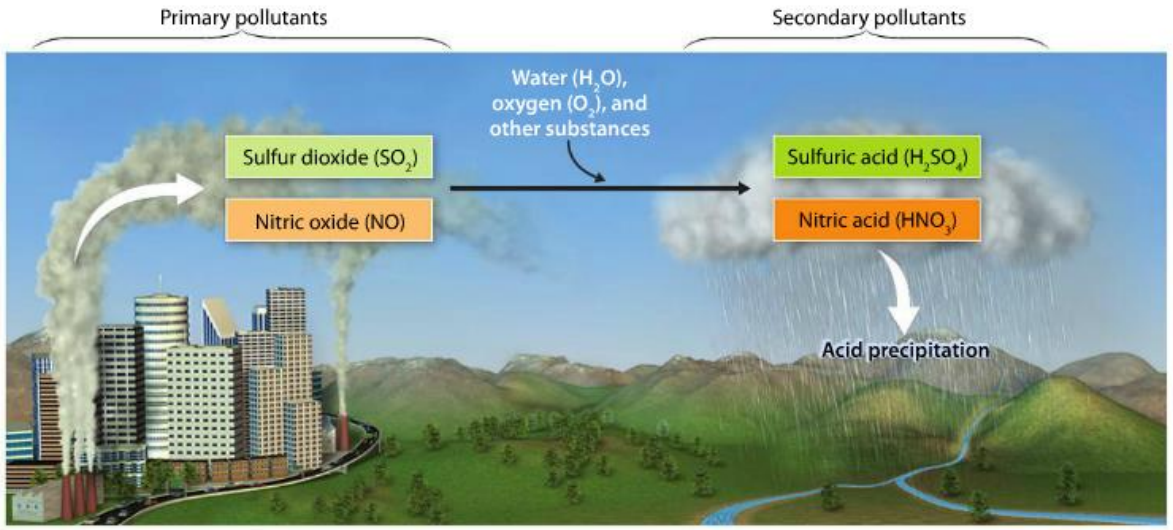
(a) Normal Conditions



Pollution of the Atmosphere Explicit Instruction

Acid deposition results when products of combustion combine with water, oxygen, and other substances in atmosphere.

- Acid deposition is water vapor that contains acids that falls to the ground as rain, snow, sleet or hail.
- Acid rain is termed for rain that falls below a pH of 5.6 (normal rain pH).
- Acid deposition starts mainly when sulfur dioxide and nitrogen oxides are put into the troposphere.
- Acid deposition kills trees, destroy forests, erode stones and buildings, and contaminate drinking water.



Pollution of the Atmosphere Guided Practice

Central Case : Changing Toward Cleaner Air in London (p. 451)

Question: How can we ensure everyone has clean air to breathe?

Pollution of the Atmosphere Independent Practice

1. What are three natural processes that contribute to air pollution? What role does human activity play in magnifying these methods?
2. Describe two ways air pollution has a negative affect on the human respiratory system. Why is carbon monoxide particularly harmful to humans to breathe?
3. How do temperature inversions act to hold air pollution near the Earth's surface? What does the air look like in city's when this occurs?
4. Why might developing nations be more reluctant than developed nations to take measures to control industrial smog?