

## 1. Global Warming terms:

**Greenhouse effect**: the process by which the sun and greenhouse gases warm the earth.

*Picture ideas*: sun, greenhouse (heat-trapping gases work like glass of a greenhouse), hot people sweating, flooding, agriculture (re agricultural shifts that could occur), snow and ice (representing the ice age - when there's less greenhouse effect going on the earth is colder).

**Carbon dioxide/greenhouse gases**: Heat-trapping gases. Carbon dioxide is the main gas and comes primarily from burning fossil fuels. Others are methane, water vapor, methane, nitrous oxide, CFCs.

*Picture ideas*: factories emitting pollution, drawing arrows into leaves sucking up the carbon dioxide.

**Deforestation**: process of clearing forests. Forests use carbon dioxide during photosynthesis; when we cut down the forests there are fewer trees to take up carbon dioxide, thereby contributing to increased greenhouse gases in the atmosphere and global warming.

*Picture ideas*: trees cut down or burned, denuded areas, stumps.

**Climate**: average weather conditions on earth, taking into account how much it rains, average temperatures, and wind patterns around the world.

*Picture ideas*: weather pictures, maps, types of environments, deserts (global warming may lead to increased desertification).

## 2. Ozone-Hole terms:

**Atmosphere**: the mass of gases surrounding the earth.

**Ozone hole**: thin place in the ozone layer located in the stratosphere high above the earth. Ozone thinning has been linked to destruction of stratospheric ozone by CFCs and related chemicals. The CAA has provisions to reduce and eliminate the production and use of these chemicals. Ozone holes have been found above Antarctica, Canada, northern parts of the U.S., northern Europe.

*Picture ideas*: draw hole in stratosphere picture, holes over maps in these areas, sunburn, suntan, eyes (eye problems can be caused by sun rays), beach, sunscreen, sunglasses, person in shade, frogs (some scientists think some amphibians are disappearing because they're sensitive to UVB).

**Ultraviolet B rays**: type of sunlight filtered out by ozone layer. Exposure to UVB has been associated with skin cancer, eye cataracts, damage to the environment.

*Picture ideas*: draw in rays coming through ozone hole; squiggly ray lines

**CFCs**: (chlorofluorocarbons) CFCs and their relatives have been used in great quantities in industry, for refrigeration and air conditioning, and in consumer products. They take part in chemical reactions which result in reduction of the ozone layer.

*Picture ideas*: styrofoam cup, aerosols/hair spray commercial, refrigerators, air conditioners.

### 3. Ground-Level Ozone and Particulate Matter terms:

**VOCs:** A smog-forming chemical found in paints, solvents (like dry cleaning solvent), gas station fumes. Also from burning fuels (from cars, trucks and factories).

*Picture ideas:* dry cleaning/clothes, paints, gas station, cars, factories.

**NO<sub>x</sub>:** A chemical that reacts with VOCs to form smog (also a component of acid rain). Produced primarily from burning fuels, including gasoline and coal.

*Picture ideas:* factories, cars.

**Smog:** a mixture of pollutants, principally ground-level ozone, produced by chemical reactions in the air involving smog-forming chemicals. A major portion of smog-formers come from burning of petroleum-based fuels such as gasoline. Smog can harm health, damage the environment, and cause poor visibility. Major smog occurrences are often linked to heavy motor vehicle traffic, sunshine, high temperatures and calm winds or temperature inversion (weather condition in which warm is trapped under cold air so that it cannot rise). Smog is often worse away from the source of the smog-forming chemicals, since the chemical reactions that result in smog occur in the sky while the reacting chemicals are being blown away from their sources by wind.

**Particulate Matter:** includes soot, dust, and other tiny bits of solid materials that are released into the air. Particulates are produced by the burning of diesel fuels by trucks and buses, incineration of garbage, application of fertilizers and pesticides, tilling the soil, road construction or unpaved roads, industrial processes (steelmaking, mining), agricultural burning, and operation of fireplaces and woodstoves. Particulate pollution can cause eye, nose and throat irritation.

*Picture ideas:* agriculture pictures, fireplaces, wood burning, trucks, buses, dirt roads, industry pictures, watery eyes and stuffy nose ads.

**Respiratory:** as in respiratory system, the system of organs for breathing. PM is bad for the respiratory system.

*Picture ideas:* nose, mouth, esophagus, lungs (those antacid commercials), coughing, a person, draw lungs, tissues.

#### 4. Acid Rain terms:

**Fossil Fuels**: fuels formed in the earth from plant or animal remains (coal, oil, natural gas).

*Picture ideas*: coal, gas station, picture of lit up city or energy use (idea that if you conserve you use fewer fossil fuels).

**SO<sub>2</sub>**: Major ingredient in acid rain which can damage trees and lakes. Comes from burning of coal and oil and industrial processes.

**Acid Rain**: Air pollution produced when acid chemicals are incorporated into rain, snow, or mist. The acid comes from sulfur oxides and nitrogen oxides, products of burning coal and other fuels and from certain industrial processes. When these chemicals are released from power plants and other sources, winds blow them far from their source. If the acid chemicals in the air are blown into areas where the weather is wet, the acids can fall to earth in rain, snow, fog, mist. In areas where the weather is dry, the acid chemicals may become incorporated into dusts or smokes. Acid rain can damage health, environment, property.

*Picture ideas*: statues, dirty buildings (draw dirty marks on buildings and statues), rain, umbrellas, lung problems, factories.

**Combustion**: burning. Many important pollutants, such as SO<sub>2</sub>, NO<sub>x</sub>, and particulates are combustion products, often products of the burning of fuels such as coal, oil, gas, wood.

**Emission**: release of pollutants into the air from a source. A source is any place or object from which pollutants are released - power plant, factory, dry cleaning business, gas station, cars, trucks, machines, consumer products.