Breathing Prehistoric Air

**Goal:** To help students understand global warming and the greenhouse effect and what they can do about it.

**Subjects:** Reading, Science, Social Studies, Math

**Background:**

Between 1850 and 1950, we burned 60 billion tons of fossil fuel, mostly coal. The world now burns at least 5 billion tons of fossil fuels each year. This means we are adding between 15 and 20 billion tons of carbon dioxide to the air every year.

People all over the world are upset about the destruction of the tropical rain forests. Every year an area of tropical rain forest about the size of California disappears. But the people who live in the countries where rain forests are located are clearing them for much the same reason we cleared our forests over 100 years ago—to use the timber and put in farms and ranches. Oklahoma has only half as much forest land now than it did before it was settled.

Rainforests are usually cleared by burning. This causes a double problem for the atmosphere, because not only are the trees no longer there to absorb carbon dioxide, but burning the trees releases more carbon dioxide into the air.

Besides carbon dioxide, scientists have discovered some additional greenhouse gases. Methane gas comes from the decay of organic matter in swamps, bogs, and rice patties caused by the warming of the earth. Deforestation is also partly to blame because of the large number of termites that have moved into the cleared forests. Termites produce methane gas as they break down plant materials. Some scientists are trying to find out how much methane gas is produced by the belching of all the world’s cattle. Methane gas also comes from landfills and garbage dumps, coal mines and leaking natural gas lines.

Nitrous oxide and chlorofluorocarbons (CFC’s) are two other chemicals scientists think are acting as greenhouse gases. Nitrous oxide comes from fertilizer and other agricultural activities and CFC’s come from aerosol cans, plastic foam products and coolants in air conditioners and refrigerators. CFC’s are partially troublesome because they destroy ozone. Ozone is a pale blue gas which is poisonous to humans and most animals, but high in the earth’s stratosphere it acts as a sunscreen to keep out the sun’s most dangerous radiation. In the United States it is now against the law to use CFC’s in aerosol cans, but some countries still allow them. There is also a new law that coolants from old air conditioners and refrigerators must be recycled before the appliances are thrown out. People who service air conditioners and refrigerators have to follow certain procedures to make sure they don’t spill coolant.

**Activity:**

1. Hand out student worksheets.
2. Have students read the information on the worksheet and answer the questions at the end.
3. Share the background materials.
Related Activities:

1. Get a large glass jar (one gallon or larger) and paint it black. Fill the jar with water. Let all your students feel the jar and note it feels cool to the touch. Leave it in a sunny window for a few days. Have students touch the jar at different times of the day and register the changes in temperature. How close do you have to get before you can feel the heat? Explain that the water jar is trapping solar energy just as the greenhouse gases trap solar energy in the atmosphere.

2. Have students pinpoint the locations of rain forests on a world map. Then lead a discussion about the burning of the rain forests. Point out that people in undeveloped countries are clearing the rain forests for the same reason settlers in Oklahoma cut down half the forests here—because they thought they could make a better life for themselves. Have students research the rainforest issue and write reports or opinion papers.

3. Have students work out the following math problems:

   In the 100 years between 1850 and 1950 we burned 60 billion tons of fossil fuels. We now burn 5 million tons of fossil fuels per year. At this rate, how many years will it take us to burn the same amount of fuel we burned during 1850 and 1950 (60 billion divided by 5 billion = number of years).

4. Have students make lists of things they can do to conserve energy, reforest the planet, and find alternative energy sources—the three suggestions for slowing down global warming. Try to keep the suggestions personal, e.g., volunteer to walk or ride their bikes to school instead of having their parents drive them, turn off the light and the radio when they go out of a room, recycle, plant trees, buy things with as little packaging as possible, avoid buying disposables.