
SYNOPSIS:

You can't see it... you can't touch it... yet it helps protect life here on earth. Like a giant filter, ozone surrounds our planet and keeps out much of the Sun's harmful ultraviolet radiation. When scientists discovered "holes" in the ozone – drops in the ozone levels – it led to worldwide concern.

In this program, we'll travel to the South Pole where a multinational force of scientists came together to unravel one of the most perplexing and important environmental questions of modern times. We'll discover the answers to the mystery and what is being done today to keep our ozone "blanket" safe for a long time to come.

CURRICULUM UNITS:

Biology
Chemistry
Earth Science
Environmental Science
Health and Medicine
Meteorology

CAREER OPPORTUNITIES:

Aviator
Chemist
Environmental Engineer
Materials Engineer
Medical Researcher
Meteorologist

PROGRAM OVERVIEW:

Ozone, a special form of oxygen, forms a protective layer of gas in the lower atmosphere surrounding the earth. The ozone layer formed over primitive earth. Generated from the sun and the oxygen by-product of photosynthetic procedures on earth, it has protected life on our planet from much of the sun's harmful ultraviolet rays.

Since the 1950's, ozone levels have been drawing scientific interest. These fluctuations in ozone levels were first noticed at the South Pole in the late 70's. Since this discovery, scientists have been and still are doing all they can to discover what causes ozone depletion as well as how to save our ozone.

ISSUES AND CRITICAL THINKING:

1. After viewing this program:
 - What is ozone, and where is the ozone layer?
 - How does the ozone protect us?
 - Where did scientists first discover an ozone hole?
 - How did they learn more about it?
 - What was determined to be the likely cause of the ozone depletion? How was this determined?
 - What was done to help stop ozone depletion?
2. Using Styrofoam balls and toothpicks, work with students to construct molecular models of oxygen and ozone.
3. What other gasses and substances compose earth's atmosphere? Diagram the layers of the atmosphere.
4. Talk about the different kinds of light and energy the sun gives off. How do they impact our planet? (Depending on the level of your students, you could discuss the electromagnetic spectrum and the various kinds of electromagnetic radiation, diagramming the reactive locations for gamma, cosmic, ultraviolet, visible, infrared, microwaves, and radio waves.)
5. How do your students feel about ozone depletion as an environmental threat compared to other environmental issues?
6. On a world map, have students point out the area over which the ozone "hole" was discovered. What forms of life live in the area under the hole? (Hint: the area is rich with phytoplankton.) Without the protection of the ozone layer, how might they be affected?

GLOSSARY:

ALGAE- single cells or groups of cells containing chlorophyll and other pigments necessary for photosynthesis.

ALTITUDE- a term referring to a distance above the surface of the earth.

ANTARCTICA- the large, frozen, continental landmass at the earth's pole latitudes.

ATMOSPHERE- the layer of gases surrounding earth.

CHLOROFLUOROCARBONS (CFCs)- compounds composed of carbon, fluorine, and chlorine. When exposed to ultraviolet light in the atmosphere, CFC molecules are thought to break down into ozone destroying chlorine.

METEOROLOGIST- a scientist who records, studies, and models weather and atmospheric conditions in order to provide accurate predictions of upcoming conditions.

MOLECULE- two or more atoms chemically bonded.

OZONE- a molecule consisting of three oxygen atoms.

POLAR REGIONS- the areas at the extreme southern (South Pole) and northern (North Pole) latitudes.

THEORY- a guess or unproven explanation as to why or how certain things occur or can be observed.

ULTRAVIOLET RAYS (UV)- powerful waves of light radiation, which is invisible to humans.

The Wonders of Earth Science



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ENVIRONMENTAL SCIENCE: OUR OZONE BLANKET



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