Dear Educator,

The survival of our planet is in jeopardy—and the dangers are more immediate than we might expect and originate from some unexpected sources. The award-winning film SOS PLANET shows us how pollution, deforestation, global warming and destruction of habitats are bringing our planet to the threshold of environmental disaster. It is a wake-up call for deeper awareness and action by all concerned—the media, politicians, governments, environmental groups, and individuals. In SOS PLANET, the difficulties facing our complex interrelated ecosystem are vividly presented through the eyes of animals, sending a straightforward message: We must act now, before it is too late.

SOS PLANET is a 40-minute, 3D/2D documentary that combines live-action and computer-generated imagery. It was produced by nWave Pictures in association with World Wildlife Fund for Nature—Netherlands. Walter Cronkite is the screen host and narrator. SOS PLANET uses a special venue attraction created by the WWP Netherlands as its focal point. The venue captivates and entertains audiences while also informing them about key conservation issues. Messages about the greenhouse effect, destruction of marine habitats, and deforestation of tropical rain forests are presented at the venue in an innovative 13-minute 3D movie with 4D-in-theater effects.

SOS PLANET expands these messages about the three key environmental issues covered in the venue, and sets forth the tremendous difficulties of getting ample coverage of serious environmental issues to the public in today’s highly commercial mass media.

What nWave Pictures are pleased to bring to you this guide with activities that focus on the environmental themes of SOS PLANET. The point of the film is particularly significant for today’s students, whose lives will be directly affected by the consequences of global warming, overfishing and deforestation—unless they become aware of the problems now and learn to take action.

Sincerely,

Ben Stassen
CEO, nWave Pictures

This guide has been designed for students in both grades 3-5 (ages 9-11) and grades 6-8 (ages 12-14). Each age level has its own student activity masters on facing pages in this guide.

TEACHER’S GUIDE FOR ALL ACTIVITIES

The film of SOS PLANET, along with the material covered in this guide, is designed as a call to action for the young people of today whose lives will be directly affected by the environmental issues raised in the film unless action is taken now. It is made very clear that if global warming, depletion of the oceans and destruction of their rain forests are left unchecked, the consequences could be extremely serious. Governments and international governing bodies must be responsible for making and enforcing environmentally sound laws and regulations, and each of us must take immediate actions to help. SOS PLANET” leaves us with the message. As individuals have the power to change the world.

As you work with this guide, keep in mind the following activities that can be tailored to your interests and those of your students. Discussion of each, or all, of the three environmental topics covered in SOS PLANET can be used as a springboard for individual or community action. Here are some ideas:

- Make a list of simple things students and their families can do. Then, as a class, select a few actions and devise a plan to help implement them. Your class could:
  - make reminders for recycling, turning off lights, conserving water, etc.
  - have a “save paper” program for students, teachers, and the school office.

- Sponsoring a hike to raise money that might ordinarily be thrown away.
- Organize a “save the earth”/“save the water” weekend for families in your class or school.
- Educate consumers of products made from non-sustainable sources.
- Eat less seafood from the overfished categories.
- Reduce the use of lawn fertilizers, which ultimately are washed into the ocean and help destroy coral reefs.
- Buy products with less packaging.
- Use products made through recycling.
- Recycle as much as you can in your home or school.
- Organize a litter clean-up in your community.
- Support tree planting programs locally and a “Save the Rain Forests” program internationally.
- Find out what is being done about a specific community or environmental issue. What action needs to be done? How can we help?

- Conduct a “mock town meeting” about deforestation. Have students research the issue from many positions—those of government officials, logging company executives, local farmers, environmentalists, indigenous tribes, a pharmaceutical company representative, concerned citizens groups, or consumers who want fine furniture made of tropical woods.

LIVING IN A GREENHOUSE

ANSWERS FOR GRADES 3-5 (AGES 9-11)

Part B. Atmosphere Models

For the demonstration of the atmosphere in Part B, follow the instruction given in the beginning of Part B on the activity master for older students (pages 5-9).

Part C. Draw It

The drawings should show the Sun’s rays entering but being blocked from escaping, inside both the greenhouse and the atmosphere. Both models should show a temperature increase.

ANSWERS FOR GRADES 6-8 (AGES 12-14)

Part A. Like a Greenhouse

Greenhouse Gas Cause: Global Warming

Greenhouse gases let the high-energy solar radiation pass through but block the infrared rays given off by the warmed surfaces of Earth. Heat is trapped and the temperature rises. The greater the greenhouse gas concentration, the more heat is blocked, and the hotter it gets.

Ozone Depletion

CFCs are responsible for ozone depletion. CFCs are used in refrigerators, air conditioners, polymer foams, and propellants for spray bottles. CFCs were banned about 40 years ago. Some U.S. companies have developed CFC-free ways of manufacturing halocarbons and other aerosol based products. One ozone depletion may be greatest in Antarctica and the Southern Hemisphere, during a 4-6 week period that starts in September. It is also seen mostly during the winter in the Northern Hemisphere and mid-latitudes.

SOS PLANET
Activity 2: Fish vs. Fishing Nets

**Part A. Fish as Food**

**Status of Fish** Below is a list of overfished species. Those mentioned in SOS PLANET are indicated by an asterisk (*).

- King Crab
- Bluefin Tuna
- Atlantic Cod
- Yellowtail Snapper
- Haddock*
- Atlantic Salmon*
- Atlantic Lobster
- Red Snapper
- Swordfish*
- Black Marlin*
- Flounder*
- Shark
- New England Halibut*
- Halibut*

Accept reasonable answers for the terms abundant, steady, overfished, and depleted, and make sure students see that they indicate a relative decrease in that species and possible extinction.

**Part B. Barriers to the Reef**

**Importance** It is estimated that over one-quarter of all marine species depend on a healthy coral reef for shelter, nutrients, and breeding grounds. Coral reefs provide a source of food for millions of people and form natural wave barriers for beaches and coastlines. Some valuable medicinal chemicals can be produced from coral reef inhabitants. Coral skeletons have been used as bone substitutes in reconstructive bone surgery.

**Bottom Trawling** Bottom trawl nets indiscriminately crush all plant and animal life in their path—soce up to foraging marine mammals. The sea floor is scarred, gouged and leveled, rocks and boulders are uprooted, and corals are broken. All reef or ocean floor inhabitants—vertebrates and invertebrates—are endangered by a bottom trawl. Turtles, whales, sharks and dolphins are among those often trapped in large area fishing nets. Small juvenile fish and other animals are caught in small mesh nets.

**Other Destructive Fishing Methods** All of these methods destroy not only commercial target fish but non-commercial, non-target marine life as well.

- A solution of sodium cyanide is sprayed into the water near the target fish, causing them to lose their equilibrium and become easy prey. This poison has been found in dead sea lions, dolphins and whales.
- Dynamite or blast fishing kills anything in the blast impact zone.
- Muro ami involves a group of people pounding on the coral with instruments to drive fish into nearby nets. Any fleeing animal is netted and the corals are damaged.

**Destructive Human Activities** Industrial pollution such as oil, pesticides and fertilizers poison the coral. Sediment and silt from poor land management smother and block sunlight needed by the corals. Collecting specimens for seaweeds and tropical fish for aquariums takes toll on coral reefs. Carbon dioxide and ammonium trample and crush corals. Digging for coral skeletons and harvesting sponges for the aquarium trade is one of the most destructive methods for corals. The sea floor is scarred, gouged and leveled, rocks and boulders are uprooted, and corals are broken. Small juvenile fish and other animals are caught in small mesh nets.

**Social and Economic Consequences** Overfishing can result in the collapse of fishing and fishing-related industries, adversely affecting jobs, income and recreational fishing. In many coastal nations, fishing supplies the protein for human diets, without it, public health is affected.

**Solutions** Include the use of large aquaculture to raise popular salt water fish, shellfish and crustaceans and to grow seaweed, enhance international agreements and fisheries laws to monitor and check catch limits, catch size, gear and net sizes, seafloor deviation on small mesh nets to save larger animals, return to the use of traditional net materials, and less demand for consumption of overfished species.

Activity 3: Losing the Forest for the Trees

**Part A. The Cycle of Gases**

Carbon Dioxide Oxygen Cycle

**Destruction of rain forests means loss of photosynthesis takes place, which in turn means more carbon dioxide builds up and less oxygen to breathe.**

**Other Gases Produced** Emissions produce carbon dioxide, carbon monoxide, methane and other trace gases such as nitrous oxide. Nitrous oxide is produced by livestock, their manure, and rotting organic debris. Deforestation can lead directly to global warming since carbon dioxide is one of the major greenhouse gases that trap heat. Both methane and nitrous oxide destroy ozone in the stratosphere.

**Part B. Going, Going, Gone?**

Percentage of Rain Forests on Earth and Rate of Destruction:

- **%:** Between 50% to 90%
- **Rate of Loss:** About 1 1/2 acres per second

**Importance** It has been estimated that 50% to 90% of the world’s species live in rain forests—more specifically, 70% of vascular plants, 30% of land vertebrates, and 90% of arthropods.

**Other Gases Produced** Emissions produce carbon dioxide, carbon monoxide, methane and other trace gases such as nitrous oxide. Nitrous oxide is produced by livestock, their manure, and rotting organic debris. Deforestation can lead directly to global warming since carbon dioxide is one of the major greenhouse gases that trap heat. Both methane and nitrous oxide destroy ozone in the stratosphere.

**Part C. Where in the World?**

See the answers listed below at the beginning of Part B.

**Part D. Putting It All Together**

**Part E. Putting It All Together**

See the activity master for Grades 3-5 (Ages 9-11), Part D. Write About It

**Part F. Putting It All Together**

See the answers listed below at the beginning of Part B.

**ANIMALS AT RISK**

**Solutions**

- **Actions for Governments and International Organizations**
  - Create global awareness of the urgency of the problem.
  - Significant increases in the number and size of protected areas where no logging or resource extraction would be allowed.
  - Plant harbor trees that could be harvested in 5-6 years.
  - Plant and harvest sustainable medicinal plants, fruits, nuts, oil, rubber, chocolate, etc.
  - Snow communities, land owners, governments and companies viable financial reasons to protect, not destroy, the rain forests.

- **Solutions**
  - Decrease demand for wood and paper.
  - Do not buy tropical hardwood furniture.
  - Purchase products and hardwoods only from sustainable-growth programs.
  - Decrease demand for wood and paper.
  - Do not buy tropical hardwood furniture.
  - Purchase products and hardwoods only from sustainable-growth programs.

- **Actions for Citizens**
  - Purchase products and hardwoods only from sustainable-growth programs.
  - Decrease demand for wood and paper.
  - Do not buy tropical hardwood furniture.
  - Purchase products and hardwoods only from sustainable-growth programs.


**ACTIVITY 1**

**Part A. Like a Greenhouse**

If you have ever been inside a greenhouse, you know that the air inside is warmer than the air outside. The glass of the greenhouse lets the Sun’s rays in, but the glass will not let any of the heat out. It becomes trapped inside, making it even warmer.

There are gases in the atmosphere that act like the glass on a greenhouse. They are water vapor, carbon dioxide, methane, nitrous oxide, and chlorofluorocarbons (CFCs). What do they do to the Sun’s heat?

An increase in these gases causes global warming—an increase in the annual average temperature on Earth. Why?

What could happen if an increase in temperature affected the polar ice caps?

Ultraviolet rays from the Sun have enough energy to burn skin and damage human cells, but many are filtered out by ozone, a special form of oxygen gas in the Earth’s atmosphere.

Scientists have discovered that the ozone is being destroyed by some of the greenhouse gases and by other manufactured chemicals called CFCs used in refrigerators, air conditioners, some plastic foams, and in some spray cans. The ozone layer is becoming much thinner—and that is a real concern for human survival.

How could the loss of ozone affect people and plant and animal life?

What can we do to help stop the loss of ozone?

**Part B. Atmosphere Models**

Your teacher will prepare two soda bottles that show how our atmosphere works. Watch the demonstration and answer these questions:

Which bottle do you expect to get hotter?

Why?

What does the light source stand for?

- the soil/sand?
- the bottle and the air in it?
- the plastic cover?

Which bottle became hotter?

Was this what you predicted?

How is this a good model for the greenhouse effect?

Children or animals should never be left in parked cars during the summer—not even for a few minutes. Why not? What could happen?

C. Draw It

Use one color to draw arrows to show what happens to the Sun’s rays when they hit both the glass of the greenhouse and the atmosphere surrounding Earth. Use another color to draw arrows to show what happens to the heat from inside the greenhouse and Earth’s surface. What is happening to the temperature in both the greenhouse and on Earth?

**ACTIVITY 2**

**Part A. Like a Greenhouse**

Even without a heating system, the temperature inside a greenhouse is warmer than it is outside. The greenhouse glass lets the shorter wavelength of solar energy pass through to warm the surfaces inside. These heated surfaces give off longer, infrared waves, trapping heat inside that the glass will not let escape.

Water vapor, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and chlorofluorocarbons (CFCs) in the atmosphere are called greenhouse gases because they behave much like the glass on a greenhouse. What do these gases do to the incoming solar radiation?

What do they do to the infrared radiation from Earth’s surface?

How can the increase of these gases lead to global warming?

Ultraviolet rays from the Sun have enough energy to burn skin and damage DNA in cells, but many never reach us. They are filtered out by ozone, a special form of oxygen gas in the Earth’s atmosphere. Use another color to draw arrows to show what happens to the Sun’s rays when they hit both the glass of the greenhouse and the atmosphere surrounding Earth. Use another color to draw arrows to show what happens to the heat from inside the greenhouse and Earth’s surface. What is happening to the temperature in both the greenhouse and on Earth?

**Part B. Atmosphere Models**

Try the following experiment to create your own model of the atmosphere and the greenhouse effect:

1. Remove the lids from two plastic soda bottles and put a cup of soil in each.
2. Wrap the bottoms of two thermometers with a paper towel or cloth. Tape them just above the level of the soil so they are at the same location on the side of each bottle, facing outward toward you for easy reading.
3. Leave one bottle uncovered. Cover the other bottle tightly with clear plastic and attach with a rubber band.

Which bottle became hotter? __________________________
Was this what you predicted? __________________________
How is this similar to the greenhouse effect? ________________________________________________________________

Ultraviolet rays are short waves from the Sun. They have enough energy to burn skin but some never reach us. They are filtered out by ozone, a special form of oxygen gas in the Earth’s atmosphere. Use another color to draw arrows to show what happens to the Sun’s rays when they hit both the glass of the greenhouse and the atmosphere surrounding Earth. Use another color to draw arrows to show what happens to the heat from inside the greenhouse and Earth’s surface. What is happening to the temperature in both the greenhouse and on Earth?

What could happen if an increase in temperature affected the life in the annual average temperature on Earth? Why?

What do they do to the infrared radiation from Earth’s surface?

How can the increase of these gases lead to global warming?

Ultraviolet rays from the Sun have enough energy to burn skin and damage DNA in cells, but many never reach us. They are filtered out by ozone, a special form of oxygen gas in the Earth’s atmosphere. Use another color to draw arrows to show what happens to the Sun’s rays when they hit both the glass of the greenhouse and the atmosphere surrounding Earth. Use another color to draw arrows to show what happens to the heat from inside the greenhouse and Earth’s surface. What is happening to the temperature in both the greenhouse and on Earth?

**Part C. Our Future or Science Fiction?**

SOS PLANET depicts scenarios where Earth might become like an arid desert. Can you imagine this for your area?

Record your data here:

_______ min. What do you think of this model? What is represented by the light?

_______ min. What could happen if an increase in temperature affected the life in the annual average temperature on Earth? Why?

_______ min. What do they do to the infrared radiation from Earth’s surface?

_______ min. How can the increase of these gases lead to global warming?

_______ min. Describe any difference in the temperature change in each bottle.

_______ min. Which one became hotter?

_______ min. Was this what you predicted?

_______ min. These bottles model the atmosphere. What is represented by the light?

_______ min. What could happen if an increase in temperature affected the life in the annual average temperature on Earth? Why?

_______ min. What do they do to the infrared radiation from Earth’s surface?

_______ min. How can the increase of these gases lead to global warming?

_______ min. Describe any difference in the temperature change in each bottle.

_______ min. Which one became hotter?

_______ min. Was this what you predicted?

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_______ min. Which one became hotter?

_______ min. Was this what you predicted?

_______ min. These bottles model the atmosphere. What is represented by the light?

_______ min. What could happen if an increase in temperature affected the life in the annual average temperature on Earth? Why?

_______ min. What do they do to the infrared radiation from Earth’s surface?

_______ min. How can the increase of these gases lead to global warming?

_______ min. Describe any difference in the temperature change in each bottle.

_______ min. Which one became hotter?

_______ min. Was this what you predicted?

_______ min. These bottles model the atmosphere. What is represented by the light?

_______ min. What could happen if an increase in temperature affected the life in the annual average temperature on Earth? Why?
**MUCH MORE THAN A FISH TALE**

### ACTIVITY 2

#### CIRCLES 3-5 (AGES 9-11)

Throughout history, people have fished for food, recreation, adventure and as a way of life—thinking that the seas would never run out of fish. There were no laws or regulations about how to fish or what to take from the sea. In recent years, more fish have been caught than nature can replace. The film SOS PLANET shows entire species of fish disappearing or being diminished. It also shows the drastic effects of a net being dragged over the coral reef.

### Part A. Fish vs. Fishing Nets

Can you imagine the seas without any fish in it? Many fish are caught for seafood. They supply protein for our bodies. Write the names of at least three ocean fish that people eat:

<table>
<thead>
<tr>
<th>Fish</th>
<th>Location</th>
<th>Use</th>
<th>Food Chain Information</th>
<th>Cause of Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sardine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuna</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sea mammal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Now your teacher will read a list of overfished species. Are any of those you named on this list? Which ones?

People used to fish with spears, hooks and very small nets, but today they use sonar, radar and satellite devices to help locate and track fish. Huge factory ships use nets the size of football fields and other gear that has very small mesh.

**How could trawling with very long, strong mesh nets with small openings be harmful to large fish like tuna and sea creatures such as turtles and dolphins?**

 Pretend you and your classmates are members of an international group that has been asked to make rules to prevent overfishing. Brainstorm some ideas you think can be helpful in doing this. Tell how each one is beneficial.

#### Part B. Barriers to the Reef

Coral reefs have been called the rain forests of the deep. A single coral reef may be home to as many as 3,000 different species of fish. Coral reefs are important to humans, too, as a source of food and some medicines—yet reefs also are endangered.

In one sequence of SOS PLANET, a turtle swims with a seahorse on a coral reef when suddenly a huge dragnet from a fishing boat sweeps across the reef floor. This is called bottom trawling. Bottom trawling is not only threat to life in the reef. Another fishing method squirts poison around the reef, and dynamite is often used to blast fish out of the water.

Pretend you are a reef fish or another creature from the list below:

- Colorful tropical fish
- Sea star or crab
- Sea bird
- Sea mammal feeding on the bottom as the net comes by

Describe the danger to you and your habitat by:

- the dragnet:
- the poison:
- the blasting:

Some scientists predict that 70% of reefs may be destroyed in the next few decades. The human activities listed below are harmful to coral reefs. Form a group and have each member select a different activity from the list, then write a TV or radio news segment about the kind of damage it causes. Have two group members think of some solutions to protect, save and rebuild reefs. Present your news program to the class.

- Drilling and snorkeling
- Building along the coasts
- Collecting of souvenirs and tropical fish
- Farming coastal land

**How could trawling with very long, strong mesh nets with small openings be harmful to large fish like sardines?**

**How can a larger mesh net be beneficial to very small fish like sardines?**

ACTIVITY 2

#### CIRCLES 6-8 (AGES 12-14)

Throughout history, people have fished for food, recreation, adventure and as a way of life—thinking that the seas would never run out of fish. The film reminds us that ocean fish catches increased 25 times in the 20th century. The World Wildlife Fund estimates that two-thirds of the fish stocks that supply the global market have been over-exploited or fished to maximum capacity. Try this activity to get a better idea of how overfishing occurs.

#### Part A. Fish vs. Fishing Nets

A fish population is often categorized as abundant, steady, overfished or depleted. Discuss what you think each of these terms means. Write down ideas you think can be helpful in doing this. Tell how each one is beneficial.

#### Part B. Barriers to the Reef

Coral reefs—the rain forests of the deep—have thrived on Earth for over 50 million years. By some estimates, a single coral reef may be home to as many as 3,000 different species of fish. Coral reefs are important to humans, too, as a source of food and some medicines—yet reefs also are endangered.

**What are some sea creatures that might be “bycatch” in small nets?**

**What kind of damage can a dragnet do to the reef, the ocean floor, and the creatures?**

**How could trawling with very long, strong mesh nets with small openings be very harmful to large fish like tuna and sea creatures such as turtles and dolphins, which are often more than 3 feet (1 meter) in length?**

Most modern fishing methods are also wasteful because much of what is caught is thrown away. This is called “bykill” or “bycatch.” Write a dramatic example about this in SOS PLANET. What are some sea creatures that might be “bycatch” in small nets?

In larger mesh nets:

- Sardines
- Tuna

How can a larger mesh net with a 12- to 18-inch opening (30-45 cm) be beneficial to very small fish like sardines and others that are only 2 to 4 inches (5-10 cm) long?

**How could trawling with very long, strong mesh nets with small openings be harmful to large fish like tuna and sea creatures such as turtles and dolphins, which are often more than 3 feet (1 meter) in length?**

One sequence in the film SOS PLANET shows a turtle swimming with a seahorse on a coral reef when suddenly a huge dragnet from a fishing boat sweeps across the reef floor. What kind of damage can a dragnet do to the sea floor, and the creatures?

The World Wildlife Fund estimates that more than half the world’s coral reefs are threatened by human activity. Some scientists predict that 70% of reefs may be destroyed in the next few decades if immediate, effective action is not taken.

Form a team to research destructive fishing methods and harmful human activities that affect coral reefs. Then compare your team’s answers to those of other teams in your class.
**LOSING THE FOREST FOR THE TREES**

**ACTIVITY 3**

**CIRCLES 3.5 (AGES 9-11)**

More plants and animals live in rain forests than in any other place on Earth, yet rain forests are in grave danger. As SOS PLANET opens, we see dark smoke plumes rising from various areas across Earth, showing destruction taking place nonstop.

What happens in the rain forests affects the atmosphere and, in turn, the world climate.

**Part A. The Cycle of Gases**

Look up some information on tropical rain forest destruction to answer the questions below. Use the back of this page if you need more room.

Through photosynthesis, plants take in carbon dioxide and release oxygen. Why is this so important to all of us?

What happens to the amount of carbon dioxide when forest plants are destroyed?

Why?

After valuable timber has been cut, cattle ranches are built in the cleared areas, adding greenhouse gases to the atmosphere. What are the threats to world climate from these added gases?

**Part B. Going, Going, Gone?**

The narrator in SOS PLANET tells us that if deforestation continues, the world’s rain forests will disappear within 50 years. Work in teams to research the information below.

Why are the rain forests being destroyed?

What happens in the rain forests affects the atmosphere and, in turn, the world climate.

**Part D. Write About It**

Pick one of the following writing projects for yourself or to do with a group of classmates. Share your work with the class.

A poem about them

A letter to the voice of a plant or animal in the affected habitat

A poster or slogan about the rain forests

**Part E. Putting It All Together**

Our atmosphere, oceans, land, and biosphere form a system—a change in one affects the others. An increase in greenhouse gases in the atmosphere can cause other changes.

The concept web below lists three events. Write the rest of the events on the web, showing where they go in terms of the results they could cause. Try to see how the events might be linked to each other and then draw arrows to show connections.

Increased Greenhouse Gases

Global Warming

Environmental Effects

**Part C. Where in the World?**

Many countries along and near the equator have rain forests. Your teacher will give you some names to locate on the map above. The largest rain forest is the largest in the world. Name the countries that make up.

**List of Events**

- Changes in rainfall
- Melting of glaciers and polar ice caps
- Changes in wind patterns
- Melting of glaciers
- Coastal flooding

**PLoS PLANET**

**ACTIVITY 3**

**CIRCLES 6.8 (AGES 12-14)**

Tropical rain forests are very complex ecosystems, richer in species than any other habitat on Earth. They serve a vital function in natural biological cycles, and support diverse human cultures.

Yet these giant stores of plants, animals and people are in grave danger. As the film SOS PLANET opens, we see dark smoke plumes rising from various areas across Earth, symbolizing the widespread destruction of rain forests taking place nonstop today.

**Part A. The Cycle of Gases**

What happens in the rain forests affects the atmosphere in several ways which, in turn, affects the world climate. Research rain forest destruction with your classmates to answer the questions below.

The Amazon rain forests have been called “the lungs of the planet.” Their plants take in carbon dioxide and release oxygen in the process of photosynthesis. By some estimates, as much as 20% of Earth’s oxygen is produced in the Amazon rain forests. What happens to the carbon dioxide-oxygen cycle when the rain forest plants are cut down? How does this affect us? Why?

After valuable timber has been cut and removed, the remaining rain forests are often burned and cleared. First farms and then cattle ranches are established in the cleared areas. Burning and ranching further add to the levels of harmful atmospheric greenhouse gases. What gases are produced by these activities?

What are the threats to world climate from these gases?

**Part B. Going, Going, Gone?**

The rain forests are being destroyed at an alarming rate. The narrator in SOS PLANET tells us that if deforestation continues, the world’s rain forests will disappear within 50 years—when you are middle-aged. That may seem like a long way off, but it’s not. Research information about rain forests to answer the questions below.

Many medicines today are made from rain forest products, even though scientists have only tested 1% of what is there. How will destroying the rain forests affect our supply of medicines?

Why and how are the rain forests being destroyed?

**Effect of the destruction of rain forests on each of these**

- Plants
- Animals
- Indigenous People
- Environment
- Medicines

Pretend you and your classmates are experts on the subject of deforestation of the rain forests. You have been hired by an international agency to develop solutions to the problem. On the other side of this sheet, write a list of actions for each of these groups to take—citizens, young people, and governments.

**Part C. Write About It**

Pick one of the following writing projects to do on your own or with a group of your classmates. Share your work with the class.

A descriptive poem about a before-and-after habitat

A letter to humans, an involved corporation or government, in the voice of a plant or animal in the affected habitat

A protest ad for a newspaper or magazine in the name of the affected life form (includes illustrations or graphics)

A poster or slogan to express your feelings about the rain forests

**Part D. Putting It All Together**

The SOS PLANET narrator tells us that the destruction of the rain forests could cause unknown effects on Earth’s climate and eliminate a majority of plant and animal species from the planet. Our atmosphere, oceans, land, and biosphere function as a system—a change in one affects the others.

Research information on greenhouse emissions and construct a concept web to show what some of the major consequences could be and what, in turn, is affected by each consequence. Think about the impacts not only on weather, climate, land forms, oceans, plants, and animals, but also on humans.

Draw your web on the other side of this sheet of paper and prepare a group presentation of your findings and the reasons behind them. List the references you used.
Resource Listing

http://www.nwave.com/sosplanet
http://www.rain-tree.com/facts.htm (rain forests)
http://www.seaworld.org/infobooks/Coral/habdiscr.html (corals and coral reefs)
http://www.epa.gov/globalwarming/impacts/health/index.html (U.S. Environmental Protection Agency: global warming)

Credits

Teaching Guide for SOS PLANET was created by Youth Media International, Ltd., Easton, CT
Roberta Nusin, Publisher
Writer: Inez F. Liftig
Editor: Jane E. Fieberts
Art Director: Paul Fisher

Reviewers

Mark E. Katz, President, nWave Pictures Distribution, Greenwich, CT
Alex Patrick, IMAX Educator Officer, Science Museum IMAX Cinema, London
Derek Threinen, Theatre Director, Simons IMAX Theatre, New England Aquarium, Boston, MA
Heidi Threinen, M.D., Wayland Public Schools, Wayland, MA
Paula Williams, Education Enrichment Manager, Pacific Science Center, Seattle, WA
Rachel Willis, Environmental Education Officer, At-Bristol IMAX, Bristol, U.K.

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