

Protecting Our Planet

Teacher's Guide

Grade Level: 3-4

Curriculum Focus: Science

Lesson Duration: 1-2 class periods

Program Description

See how wind, water, and ice continually change the landscape in **Erosion** (7 min.). In **Conservation** (6 min.), learn what people can do to minimize their effect on the Earth. Explore the human presence in **Galápagos** (4 min.) and learn what ecologists are doing to protect certain species. The segment **Rain Forest Plants** (3 min.) illustrates the delicate balance of the four layers of the rain forest ecosystem and how scientists hope this plant diversity holds secrets to medical breakthroughs.

Onscreen Questions

Segment One: Erosion

- What is erosion?
- Have you ever seen an example of erosion?
- How does water cause erosion?
- How does ice cause erosion?

Segment Two: Conservation

- What is pollution?
- Why is it important to protect our land, water, and air from pollution?
- What is recycling?
- How does recycling help protect our natural resources?

Segment Three: Galápagos

- How might humans have an effect on an isolated ecosystem like the Galápagos Islands?
- How are scientists working to save the animal species on the Galápagos?

Segment Four: Rain Forest Plants

- What conditions make the rain forest ideal for supporting thousands of species?
 - What are the four layers of a rain forest?
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Lesson Plan

Student Objectives

- Describe ways in which humans impact the environment.
- Understand that pollution is harmful to all living things.
- Give examples of ways we can reduce, reuse, and recycle waste.

Materials

- *Protecting Our Planet* video and VCR, or DVD and DVD player
- 2 cups dry spiral pasta dyed with red food coloring
- Poster board, 1 sheet per student group
- Pencils, erasers, and rulers
- Crayons or markers
- Computer with Internet access (optional)

Procedures

1. Discuss pollution and the ways humans negatively impact the environment. What is pollution? What human activities create pollution? A good way to introduce this topic is to watch portions of *Protecting Our Planet*.
2. After watching *Protecting Our Planet*, ask students to describe times they, or others, littered or created pollution in some way. How do litter and pollution affect plants and animals? Talk about problems that may occur when garbage is not disposed of properly.
3. Tell students that they are going to participate in a pollution activity. Take students outside or clear a large space in the classroom and have students stand in a large circle. Divide the circle in half with masking tape, a jump rope, or by some other means. Next, create five groups of students: Group One, humans; Group Two, plants; Group Three, fish, Group Four, plant-eating animals; Group Five, fish-eating animals.
4. Give Group One handfuls of the pasta and tell them to scatter it in both halves of the circle. Tell students that this pasta represents exhaust, garbage, oil, pesticides, and other pollutants from human activities. Have Group One rejoin the circle and then ask Group Two to enter the circle, pick up pieces of pasta and then stand where they found the pasta. Tell the class that members of Group Two are plants that have been impacted by the pollution in their environment. Show the class that one side of the circle represents water while the other side of the circle represents land. Both land and water plants are affected by human pollution.
5. Next, ask Groups Three and Four to enter the circle, Group Three on the water side and Group Four on the land side. Instruct these groups to "eat" a plant by linking arms with a "plant" on their side of the circle. Tell students that fish and plant-eating land animals are affected by pollution in many ways, including when they eat plants grown in polluted regions.

6. Finally, have Group Five step into the circle and “eat” a fish or “plant-eating animal” by linking arms with either a “fish” or a “plant-eating” animal. Tell students to look around the circle. Who created the pollution? What happened after the land and water became polluted? Which group looks like it wasn't affected by the pollution? Is that really true?
7. Have members of Group One step back into the circle and “eat” a plant, a fish, a plant-eating animal, or a fish-eating animal by linking arms with members of these groups.
8. Return to the classroom and discuss what happened in the exercise. Who is affected by pollution? Talk about what kinds of things pollute our environment, reasons why it is important to protect our planet from pollution, and ways in which we can avoid polluting our world.
9. Have students sit in the groups they were in for the pollution exercise and ask them to discuss pollution and ways we can reduce, reuse, and recycle waste. Then have each group design a poster including ways in which we can reduce, reuse, and recycle waste. Each poster should be creative, colorful, and present at least two facts about pollution and two ways in which we can reduce, recycle, or reuse waste. Students may use the following Web sites to assist them in creating their posters:
 - <http://www.epa.gov/recyclecity/>
 - <http://www.thomasrecycling.com/kids.html>
 - <http://www.epa.gov/kids/index.htm>
10. Display the finished posters in visible areas around the school to show other students how we can conserve our natural resources and protect our environment.

Assessment

Use the following three-point rubric to evaluate students' work during this lesson.

- **3 points:** Students were highly engaged in class and group discussions; fully participated in the pollution activity; and designed a creative and informative conservation poster with their group that met all of the criteria.
- **2 points:** Students participated in class and group discussions; somewhat participated in the pollution activity; and designed an adequate and somewhat informative conservation poster with their group that met most of the criteria.
- **1 point:** Students participated minimally in class and group discussions; did not participate in the pollution activity; and did not help their group design its poster or as a group designed an incomplete and somewhat informative conservation poster that met only one aspect of the criteria.

Vocabulary

ecology

Definition: The study of how organisms relate to each other and their environments

Context: Ecology shows us why its important to protect the Earth from pollution.

exhaust

Definition: waste gases produced by an engine

Context: Cars, trucks, and buses make a kind of pollution called exhaust.

nature

Definition: The physical world

Context: All living things are part of nature.

pollution

Definition: Harmful or poisonous substances that dirty the air, water, or land

Context: Pollution can be dangerous to people, plants, and animals.

recycle

Definition: To use something again or to convert it to a new use

Context: One way of making less trash is to recycle what we use.

Academic Standards

National Academy of Sciences

The National Science Education Standards provide guidelines for teaching science as well as a coherent vision of what it means to be scientifically literate for students in grades K-12. To view the standards, visit <http://books.nap.edu/html/nse/html/overview.html#content>.

This lesson plan addresses the following science standards:

- Science as Inquiry: Understanding about scientific inquiry
- Life Science: organisms and environments
- Science in Personal and Social Perspectives: Changes in environments

Mid-continent Research for Education and Learning (McREL)

McREL's Content Knowledge: A Compendium of Standards and Benchmarks for K-12 Education addresses 14 content areas. To view the standards and benchmarks, visit <http://www.mcrel.org/compendium/browse.asp>

This lesson plan addresses the following national standards:

- Science: Life Science—Understands relationships among organisms and their physical environment
- Health: Knows environmental and external factors that affect individual and community health

Support Materials

Develop custom worksheets, educational puzzles, online quizzes, and more with the free teaching tools offered on the Discoveryschool.com Web site. Create and print support materials, or save them to a Custom Classroom account for future use. To learn more, visit

- <http://school.discovery.com/teachingtools/teachingtools.html>
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