

People and Parks: Challenges and Solutions

What challenges do humans create for natural habitats in parks and other green spaces? How do people help to protect these places?

Overview

Students explore ways that people's actions can negatively affect natural places, including parks, through two hands-on activities. They then consider solutions to these problems.

For the complete activity with media resources, visit:

<http://education.nationalgeographic.org/activity/people-and-parks-challenges-and-solutions/>

With Support From



Directions

1. Introduce the activity.

Ask students to think of some animals that they might encounter where they live. Help them name different birds, mammals, insects, aquatic animals, and others. Ask students about animals they might see in a state or national park. Ask: *Why might you expect to see those animals in a park?*

Explain that many parks are natural places where people are often able to observe wildlife. Wild animals and people might come close to each other in a park setting. Explain that park rangers and others are careful to protect animal habitats, but human actions can affect wildlife and natural places. In this activity, students will explore two examples of how humans can have negative effects on natural environments and the wildlife that lives there.

2. Explore how litter in bear habitats can affect bears.

Project the National Geographic webpage about the black bear, and read together as a class. Talk about the black bear's natural diet. Ask: *What does it mean to be an omnivore?* (Omnivores eat both plants and animals.) Introduce the term *opportunistic*; many omnivores are opportunistic feeders. They will seek any food source that provides energy. The black bear is an opportunistic feeder.

Provide each group a copy of the Human Impacts on Parks handout with Activity #1: Food Litter and Bears. Have students use information from the webpage on black bears and other articles listed on the handout to help them answer the questions on the handout. Help students agree on the number of calories a bear might need to eat in a day (for question 3: 20,000 calories). Review the chart on page 2 of the calories for different foods, considering which foods would be natural for a bear to eat, and which would be unnatural.

Finally, students will predict which foods a bear would likely choose, if both types are available. Have students' share some of their predictions. Discuss with the whole class: *How does trash endanger bears? Why do you think people work to prevent this from happening in parks?* (Because many parks are places where humans and wildlife come in closer contact than they do elsewhere, which means bears begin to rely on humans for food. Having bears close to humans can be dangerous for both humans and bears.)

3. Investigate one way water pollution can affect wildlife.

Explain that just as leaving out food scraps can affect wildlife, another simple act—using soap to wash dishes in a stream—can also affect aquatic life. Ask students if they have seen a water strider, and show them the image. Ask them to observe how the water strider is able to float on top of the water. Distribute a paperclip, cup of water, toothpick, and small amount of dish detergent to each group.

Have students float the paperclip on top of the water. To do this, have them first place a small piece of tissue paper or paper towel on the water. They then gently place the paperclip on the tissue paper. While the paper slowly drops to the bottom of the cup, the paper clip should stay afloat. (Surface tension allows the paperclip to float.) Have them record their observations.

Once the paperclip is floating on its own, have students dip the toothpick into the soap and lightly touch the water near the paperclip. Again, have students record their observations.

Explain that the soap caused the paperclip to sink by changing the surface tension of the water. Explain that water striders' ability to float on the surface of the water can also be affected by soap or other substances that pollute the ponds where they live. These insects are an indicator species, which means they are among the first affected by water pollution. Ask:

- *How do you think soap and other pollution ends up in bodies of water in a park?* (Sometimes people introduce it directly, such as by washing dishes in a stream. In addition, litter and pollution from outside the park can make its way into the water in the park.)
- *What can people do to keep this from happening?* Ask students to brainstorm some ways they could help prevent this problem. Look in the Background Information section of this activity for

examples of how parks and other agencies work to avoid these kinds of human impacts.

4. Wrap up by discussing the concept of stewardship.

Ask: *How can people help solve problems with litter and pollution?* Have students brainstorm some possible solutions. Then, introduce some solutions that parks already have in place. You can find this information in the Background Information section of this activity.

Brainstorm other ways humans might negatively affect parks. Then have a discussion about ways humans can help, or have positive impacts on, parks. Have students give some examples, and then offer a few examples from the Background Information section. Introduce the concept of stewardship—the careful management of something important. Discuss how the National Park Service employees serve as stewards of our National Park System.

Next, show students the video “Who We Are Is What We Leave Behind,” and discuss it. Ask: *What problem in the national parks does this video discuss? Who is causing this problem? How? How are the National Park Service and Subaru addressing this problem? How could individuals help address this problem?*

Ask students to offer some ways they, too, could be stewards of our parks. Encourage them to think of ways to accomplish this, both when visiting a park and in their daily lives. Have students write a brief reflection on at least one way they would like to be a steward of our parks and other natural spaces.

Tip

Be sure students each have an opportunity to place the paperclip before adding the soap. Once the soap is in the water, it is harder to place the paperclip on the water surface.

Modification

For a language arts connection, read and discuss the Paul Fleischman poem “Water Striders.” (Fleischman, Paul, *Joyful Noise: Poems for Two Voices*. New York: Harper Trophy, 1988)

Tip

Try to float the paperclip ahead of time so you can better instruct students.

Informal Assessment

Check for understanding by reviewing students' completed lab sheets.

Extending the Learning

- Have the class monitor air quality at a nearby park, or compare two or more parks, using National Park Service webcams: <http://www.nature.nps.gov/air/webcams/>
- For more about bear and food in Rocky Mountain National park, read and show pictures from the article “Garbage Kills Bears.”
- Have students research black bears that have been moved or killed because they became habituated to human food.

- Invite a ranger or other park official to speak to your class in person or via video conference about human impacts at their park. Ask: *How does the park staff encourage visitors to help, not hurt, the park?*

Objectives

Subjects & Disciplines

Geography

- Human Geography

Science

- Ecology

Social Studies

- Current events/issues

Learning Objectives

Students will:

- Identify and explain ways humans negatively affect national parks.
- Compare the calories a bear can get from its natural diet to calories it can get from scavenging human food and litter and make predictions about which a bear would choose.
- Evaluate the impact of a water pollutant such as soap on aquatic insects.
- Describe the ways people can have positive impacts on parks.

Teaching Approach

- Inquiry: Predict and Explain
- Learning-for-use

Teaching Methods

- Demonstrations
- Inquiry
- Research

Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
 - Learning and Innovation Skills
 - Critical Thinking and Problem Solving
- 21st Century Themes
 - Environmental Literacy
- Critical Thinking Skills
 - Analyzing
 - Evaluating

- Understanding
- Geographic Skills
 - Acquiring Geographic Information
- Science and Engineering Practices
 - Constructing explanations (for science) and designing solutions (for engineering)
 - Obtaining, evaluating, and communicating information
 - Planning and carrying out investigations
 - Using mathematics and computational thinking

National Standards, Principles, and Practices

National Council for Social Studies Curriculum Standards

- **Theme 3:**

People, Places, and Environments

National Geography Standards

- **Standard 14:**

How human actions modify the physical environment

Common Core State Standards for English Language Arts & Literacy

- **Writing Standards K-5:**

Research to Build and Present Knowledge, W.3.7

- **Writing Standards K-5:**

Research to Build and Present Knowledge, W.4.7

- **Writing Standards K-5:**

Research to Build and Present Knowledge, W.5.7

Next Generation Science Standards

- **5-ESS3-1 :**

Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.

Preparation

What You’ll Need

Materials You Provide

- Calculators
- A small glass of water
- Dishwashing soap
- Paperclips
- Tissue or paper towel
- Toothpicks

Required Technology

- Internet Access: Required
- Tech Setup: 1 computer per small group, Projector, Speakers

Physical Space

- Classroom

Setup

Arrange room so students can work in small groups.

Grouping

- Large-group instruction

Resources Provided: Handouts & Worksheets

- [Human Impact on Parks](#)

Resources Provided: Images

- water strider

Background & Vocabulary

Background Information

National parks and other places where humans go to spend time in nature offer unique situations where humans and wild animals come in closer contact than they normally do. As humans come in close contact with animals, their actions can have a negative impact on those animals and their habitats. Food litter and improperly stored food can be a significant problem in parks where bears live. Black bears are omnivores and opportunistic feeders, so they will eat almost anything. When people litter or don't store their food safely, bears will take advantage of the easy opportunity to load up on calories. Bears can become habituated to looking for food in campsites and other areas humans frequent. Unfortunately, when food litter draws bears closer to campsites and other places where humans are, it provides more opportunities for dangerous interactions. Bears who develop a taste for human food often have to be relocated or killed.

Fortunately, many parks have developed education programs that inform people about the importance of storing food properly and consequences of storing it improperly. Most parks include signs in camping and picnic areas instructing visitors on how to dispose of trash and store food. Parks also include information on their websites, in ranger stations, and in the information provided to campers and other visitors. Park rangers offer special programs and visit campsites and picnic areas to remind people to be aware of bears. Besides educating people on the importance of keeping food away from bears, many parks provide food storage boxes and special trash cans to make this easier. Metal food storage boxes with special locks that bears cannot open are provided at many campsites. Campsites and picnic areas have special trashcans and dumpsters with bear-proof locks.

Water pollution is another problem that can affect aquatic life in parks, as well as other places. Visitors to national parks can impact water quality by introducing substances directly into bodies of water, such as through using streams to clean dishes. Unfortunately, what happens outside parks can also have a big impact on water and aquatic creatures in the park. For example, phosphorus and sulfur in the water in Everglades National Park are negatively affecting plants and animals there. These chemicals are being introduced into the waters in the park through runoff from nearby farms. In Shenandoah National Park in Virginia, atmospheric deposition, such as acid precipitation from fossil fuels, is lowering the pH in some streams. These broader problems have more complicated solutions.

Again, education plays a role in helping people be aware of these problems and adjust their behavior, which reduces problems like air pollution and runoff. Legislation can also play a role in limiting pollutants. Within the parks themselves, rangers and scientists monitor water quality and aquatic species to discover any problems as they arise.

Prior Knowledge

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Recommended Prior Activities

- None

Vocabulary

Term	Part of Speech	Definition
calorie	<i>noun</i>	unit of energy from food, equal to the amount of heat required to raise the temperature of one kilogram of water by one degree Celsius.
food web	<i>noun</i>	all related food chains in an ecosystem. Also called a food cycle.
indicator species	<i>noun</i>	any species that determines a characteristic of its environment, such as range or ecological health.
omnivore	<i>noun</i>	organism that eats a variety of organisms, including plants, animals, and fungi.
pollution	<i>noun</i>	introduction of harmful materials into the environment.
stewardship	<i>noun</i>	responsible management to ensure benefits are passed on to future generations.
surface tension	<i>noun</i>	property of the surface of a liquid where the molecules act like a thin, elastic film, allowing it to resist external forces.

For Further Exploration

Articles & Profiles

- [Article: Garbage Kills Bears](#)

Video

- [Who We Are Is What We Leave Behind](#)
- [Who We Are Is What We Leave Behind](#)

Websites

- [National Geographic: Black Bears](#)
- [USDA Database](#)

None

- [Bears Eat 40,000 Moths a Day in August in Yellowstone](#)



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