NATIONAL GEOGRAPHIC

RESOURCE LIBRARY I ACTIVITY : 50 MINS

Exploring Solutions to Human Impacts on Animal Migration

Students investigate different solutions to human impacts on animal migration by reading four articles. They will compare the similarities and differences of the solutions, record some pros and cons, and identify stakeholders. Students will reflect and build on previous learning from other activities in this unit.

GRADES

6, 7, 8

SUBJECTS

Biology, Ecology, Conservation

CONTENTS

4 Resources, 3 PDFs, 1 Link

OVERVIEW

Students investigate different solutions to human impacts on animal migration by reading four articles. They will compare the similarities and differences of the solutions, record some pros and cons, and identify stakeholders. Students will reflect and build on previous learning from other activities in this unit.

For the complete activity with media resources, visit:

http://www.nationalgeographic.org/activity/exploring-solutions-human-impacts-animal-migration/

In collaboration with

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learning that connects

DIRECTIONS

This activity is part of the <u>Detours and Distractions: How Humans Impact Migration Patterns</u> unit.

I. Remind students of the ways humans can <u>impact</u> animal migrations and introduce a <u>solution</u>.

- Direct students' attention to the <u>Human Impacts Photo Gallery</u> around the room.
- Ask students:

  - *In what ways do we know humans impact animal migrations and ecosystems?* (Possible responses: Human infrastructure and behavior have altered <u>animal migration</u> patterns in many ways. Roads act as a barrier to wildlife crossings; wind farms create hazards for birds, bats, and insects; climate change can render ecosystems uninhabitable.*)

- Invite volunteers to summarize the <u>wind turbine</u> problem for animal migration. (Wind turbines provide a cost-effective, clean, sustainable source of energy. But it is estimated that hundreds of thousands of birds, bats, and insects die every year when they accidentally collide with turbine blades. Bats may even succumb to the pressures created when the giant turbine blades pass through the air, a phenomenon known as barotrauma. Depending on where wind farms are located, they can also impact other animals who migrate on the ground.)
- Ask students:

  - *What are some solutions that could help this problem?*
  - Engage the class in a discussion about potential solutions. Invite students to share their ideas; record students' responses to be displayed in the classroom.
  - Possible responses may include: removing wind turbines, using them during times when they will have minimal effects on wildlife, changing locations, turning them off, or changing their shapes.

- Project the article <u>For the Birds (and the Bats): 8 Ways Wind Power Companies are Trying to Prevent Deadly Collisions</u>.
- Read the introductory section aloud to students, then either facilitate a whole-class reading of the article or assign each of the eight sections to different groups of students to read and report on the solutions addressed.
- Debrief by comparing the ideas presented in the article to students' initial solution ideas.

2. Guide students in exploring animal migration problems, solutions, and stakeholders.

- Organize students into their project groups and distribute the following resources to each student, selecting for the correct reading levels:

  - Wildlife Crossings
  - Fish Tale
  - The Gray Whale: Past, Present, and Future
  - Snake Migration
  - *Exploring Solutions to Animal Migration Problems* handout

- Orient students to the *Exploring Solutions to Animal Migration Problems* handout; explain that after they complete the reading, they will be asked to summarize the solutions outlined in the articles, identify different stakeholders, and brainstorm pros and cons to each solution.

- Define a stakeholder: a stakeholder is someone with an interest or concern in something or one who is involved in or affected by a course of action. Ask students:

  - *How many stakeholders can you identify in the wind turbine problem?* (Possible responses: wind turbine businesses; scientists who study birds, bats, or other animals; people who get electricity from wind turbines; community members who like their community with or without the wind turbines; environmentalists)
  - Remind students to keep this concept in mind as they identify stakeholders in their final project.

- Provide groups with choices for how they can work together to complete the handout; for example, students could use the Jigsaw method where each member reads one article and reports back to the others. Or, all students can read the articles together and compare notes. Each student should complete their own handout.

- Ask students to complete the handout with their groups, circulate to facilitate discussion, and press student thinking. Press student thinking with questions like:

  - *How are the components of these solutions similar or different?*
  - *Do you think the same kind of solutions would work for all animals, or do different kinds of animals need different kinds of solutions?*
  - *How would you measure success of these solutions?*

- Collect students' handouts upon completion or at the end of the activity.

3. Direct students to revisit the *Human Impacts Photo Gallery*.

- Distribute a supply of two new colors of sticky notes.
- Remind students of the initial exercise from the *Collision! Human Impacts on Animal Migration* activity: they examined each photograph in the gallery walk and identified what they thought could be impacting a migrating animal (e.g., a highway) and what effects that might have. Then explain the activity:

  - Sticky color number one: First, students will examine each photograph in the gallery walk and reflect on their earlier thinking. Encourage students to read their own, and others', original sticky notes, and to add anything that has changed about their thinking. As before, students should stick their new note on the wall next to the photograph.
  - Sticky color number two: Have students record a possible solution that could overcome the impact in the photograph. Again, students should stick their note on the wall next to the photograph.

- Bring students back together as a class and invite volunteers to share their ideas and thoughts about each photograph.

4. Start planning how students will take additional action.

- Work with students to select which of the following projects you would like to pursue at the conclusion of the unit:

  - Identify local migratory organisms. Create a backyard "pit stop" for the most vulnerable—such as a bat box or specific native flowering plants.
  - Author a class letter to Congress, local government, or a local business to encourage an animal migration solution (e.g., building a wildlife crossing bridge). Students can submit copies of their maps and presentations as evidence.
  - Download the *Animal Tracker app* or *eBird app* and follow and add to scientific knowledge about migrating animals through student citizen science field work.

- To maximize student engagement, assign student roles in the planning process.
- Remind students that this opportunity for further action serves to continue student momentum toward helping end the negative impacts of humans on animal migration and extends the impact of their project work into the local or global community.

Tip

Step 2: There are several text levels available for the articles above; choose the level that is most appropriate for your students

Tip

Step 2: The articles used for this activity can either be printed out in advance or students can engage with them on a computer or tablet.

Modification

Steps 1 and 2: Instead of having every group read every article, you could have different groups read different articles and then compare and contrast using group or class discussions.

Informal Assessment

Students' participation during class discussions, their responses on the *Exploring Solutions to Animal Migration Problems* handout, as well as their reflective responses to the *Human Impacts Photo Gallery,* provide assessment opportunities for this activity.

Extending the Learning

- Visit a local zoo or aquarium on a field trip or encourage students to go on their own. This could give students a chance to see the animals they studied, as well as add to their knowledge of animal migration. Additionally, many zoos and aquariums feature conservation programs that your class could contribute to or mirror (e.g., plant milkweed, use bird-proof glass, create a turtle crossing).

OBJECTIVES

Subjects & Disciplines

Biology
- Ecology
- Conservation

Learning Objectives

Students will:

- Reflect and build on prior thinking about human impacts on animal migration.
- Be inspired by solutions to human-made problems.

Teaching Approach

- Project-based learning

Teaching Methods

- Discussions
- Reading
- Reflection

Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
  - Learning and Innovation Skills
    - Communication and Collaboration
- Critical Thinking Skills
  - Analyzing
  - Applying
  - Evaluating
  - Remembering
  - Understanding
- Science and Engineering Practices
  - Asking questions (for science) and defining problems (for engineering)
  - Constructing explanations (for science) and designing solutions (for engineering)
  - Obtaining, evaluating, and communicating information

National Standards, Principles, and Practices

COMMON CORE STATE STANDARDS FOR ENGLISH LANGUAGE ARTS & LITERACY

- **CCSS.ELA-LITERACY.RST.6-8.2:**
Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
- **CCSS.ELA-LITERACY.SL.7.1:**
Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on Grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.
- **CCSS.ELA-LITERACY.SL.7.2:**
Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.

NEXT GENERATION SCIENCE STANDARDS

- **Crosscutting Concept 1:**
Patterns
- **Crosscutting Concepts: Cause and Effect:**
- **MS. Ecosystems: Interactions, Energy, and Dynamics:**
MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
- **MS-ESS3-4:**
Construct an argument supported by evidence for how increases in human and natural resources impact Earth's systems.
- **MS-ESS3: Earth and Human Activity:**
MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment
- **MS. Interdependent Relationships in Ecosystems.:**
MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.
- **MS-LS2: Ecosystems: Interactions, Energy, and Dynamics:**
MS-LS2-1: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem

- **Performance Expectations: MS-LS2-2:**

MS-LS2-2: Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

- **Science and Engineering Practice 1:**

Asking questions and defining problems

- **Science and Engineering Practice 6:**

Constructing explanations and designing solutions

- **Science and Engineering Practice 8:**

Obtaining, evaluating, and communicating information

Preparation

What You'll Need

MATERIALS YOU PROVIDE

- Sticky notes, two colors, multiple sheets per student
- Writing utensils

REQUIRED TECHNOLOGY

- Internet Access: Required
- Tech Setup: 1 computer per classroom, 1 computer per pair, Monitor/screen, Printer, Projector

PHYSICAL SPACE

- Classroom

SETUP

If you took down the Human Impact Photo Gallery, rehang the images and each photograph's corresponding sticky notes around the classroom.

GROUPING

- Large-group learning
- Small-group learning
- Small-group work

BACKGROUND & VOCABULARY

Background Information

Unfortunately, human infrastructure and behavior have altered animal migration patterns. From building roads that act as a barrier to wildlife crossing, to constructing wind farms that create hazards for birds, bats, and insects, to causing climate change that renders ecosystems uninhabitable for many native organisms, humans are impacting animal migration. However, many individuals and organizations are working hard to help overcome these impacts. From creating wildlife bridges that help animals cross over roads, to designing new wind turbines to minimize wildlife impact, solutions to these problems are becoming more prevalent.

Prior Knowledge

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Recommended Prior Activities

- Collision! Human Impacts on Animal Migration
- Create an Animal Migration Map
- Create an Ecosystem Map Layer
- Interactions Among Organisms in Ecosystems
- Tracking Animal Migration

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Vocabulary

Term	Part of Speech	Definition
animal migration	noun	process where a community of animals leaves a habitat for part of the year or part of their lives, and moves to habitats that are more hospitable.
argument	noun	reason or set of reasons given with the aim of persuading others that an action or idea is right or wrong.
detour	noun	unplanned or temporary path.
distract	verb	to divert or draw attention away from something.
empirical	adjective	able to be proved with evidence or experience.
evidence	noun	data that can be measured, observed, examined, and analyzed to support a conclusion.
impact	verb	to influence or have an effect on something.
implement	verb	to carry out plans.
interrupt	verb	to break the uniformity or continuity of something.
migration pattern	noun	predictable movements, in time and space, of a group of animals or people.
solution	noun	an answer to a problem.
stakeholder	noun	person or organization that has an interest or investment in a place, situation, or company.
wind turbine	noun	machine that produces power using the motion of wind to turn blades.

For Further Exploration

Articles & Profiles

- [Everglades University: Wind Turbines Killing Birds: What's Being Done](#)
- [National Geographic: Tiny Gold Monkeys and Pumas are Getting Their Own Highway](#)

None

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