

RESOURCE LIBRARY | ACTIVITY : 1 HR 20 MINS

Create a Human Impacts Map Layer

Students research a variety of resources to build a map layer showing how their focal animal's migration pattern is impacted by human activity. Students will support their map with a key, will describe at least one solution to the human impact on their animal's migration, and will identify and describe four stakeholders who have a stake in the human impact or the solution.

GRADES

6, 7, 8

SUBJECTS

Biology, Ecology, Conservation, Geography

CONTENTS

2 PDFs, 1 Link

OVERVIEW

Students research a variety of resources to build a map layer showing how their focal animal's migration pattern is impacted by human activity. Students will support their map with a key, will describe at least one solution to the human impact on their animal's migration, and will identify and describe four stakeholders who have a stake in the human impact or the solution.

For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/create-human-impacts-map-layer/>

In collaboration with



DIRECTIONS

This activity is part of the [Detours and Distractions: How Humans Impact Migration Patterns](#) unit.

I. Activate students' developing knowledge about human impacts on migration and create a *Know & Need to Know* chart to engage groups in setting research goals.

- Distribute the [Human Impacts Map Layer: Know & Need to Know Chart](#) to each student.
- Ask students to discuss the questions in their project groups and record their thoughts on their chart:
 - *What do we already know about how our animal's migration pattern is impacted by humans?*
 - *What do we already know about solutions to these impacts?*
 - *What do we need to know about how our animal's migration pattern is impacted by humans in order to create a human impact map layer?*
 - *What do we need to know about solutions to these impacts? Or, what do we need to know to create solutions to these impacts?*

2. Prepare groups for their project work.

- Explain that for the remainder of this activity, each group will research, gather, and organize information to create a final map layer showing how their focal animal's migration is impacted by humans and explaining, illustrating, or describing at least one possible solution to this impact. This map layer should also include a key.
- Remind students about the definition of stakeholders: a person with an interest or concern in something or one who is involved in or affected by a course of action.
- Explain to students that as they are learning about human impacts on their animal's migrations and recommending solutions, they will list at least four stakeholders and explain what their stake is in the impact, solution, or animal migration.
- Distribute the [Human Impacts Map Layer Rubric](#) and orient students so that they are familiar with the expectations before they begin their work.

3. Prepare groups to research and create the final migration map layer, the Human Impacts Map. (This step should take up the majority of the activity.)

- Prompt students to gather all completed map layers and handouts from previous activities.
- Help students choose and print the same map layer as their base map using [MapMaker 1-Page Maps](#).

- Set parameters for students on where they can do additional research. See the *Background & Vocabulary* tab for helpful sources.
- Support and structure student research as needed based on how the previous project work sessions have gone.
- While students are working, circulate to provide assistance and remind them of the required components.
 - Prompt for a key: *What do all of the symbols and colors on your map mean?*
 - Prompt for an understanding of the human impact on their animal's migration pattern: *How is your animal's migration impacted by humans? How are you illustrating that on your map layer? Are these effects being seen now? How might these effects continue to get worse if no solution is provided?*
 - Prompt for a list of stakeholders and descriptions of their stake: *Who is responsible for this human impact? Who would be involved or affected by a solution? How would they be affected?*
 - Prompt for an explanation of at least one solution to the human impact on the animal's migration pattern: *What are some ways that your focal animal's migration pattern can be helped? Are these solutions already in place, or ones that you are coming up with? Is there evidence that these solutions are successful? How would you measure their success? How feasible are these solutions? Are there real-life examples of this happening and helping? How long do you think it might take for this proposed solution to help?*
- Collect group maps at the end of the activity to assess students' work and provide formative feedback.

Tip

Step 1: Watch the Animal Migration [GeoChallenge Video](#) to show examples of student solutions to this problem.

Tip

Step 2: To provide some background information on maps and their components, spend time as needed exploring the [Map](#) encyclopedic entry.

Tip

Step 3: Review each group's Human Impacts Map to provide formative feedback and ensure students are meeting expectations. If your review indicates that many groups need more time to revise or improve their Human Impacts Map, adjust your pacing as needed before students develop their final presentation of the unit.

Rubric

The [Human Impacts Map Layer Rubric](#) can be used to assess each group's Human Impacts Map Layer. All group maps should show how humans impact the animal, should have a key, and should describe at least one solution to the impact. To be successful, groups should also list and describe at least four stakeholders who have a stake in the human impacts or the solution.

Extending the Learning

Solutions to human impacts on the environment influence multiple stakeholders. Hold a debate about a solution to a human impact and have different students or student groups act as different stakeholders. Different stakeholders can be local landowners, scientists, conservationists, native communities, business owners, and local communities.

OBJECTIVES

Subjects & Disciplines

Biology

- [Ecology](#)
- Conservation

Geography

Learning Objectives

Students will:

- Identify and describe at least four stakeholders that are involved with the human impact or solution.

Teaching Approach

- Project-based learning

Teaching Methods

- Discussions
- Research
- Self-directed learning

Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
 - Learning and Innovation Skills
 - Communication and Collaboration
 - Creativity and Innovation
 - Critical Thinking and Problem Solving
 - Life and Career Skills
 - Initiative and Self-Direction
 - Productivity and Accountability
- Critical Thinking Skills
 - Analyzing
 - Applying
 - Creating
 - Evaluating
 - Remembering
 - Understanding
- Geographic Skills
 - Acquiring Geographic Information
 - Analyzing Geographic Information
 - Answering Geographic Questions
 - Asking Geographic Questions
 - Organizing Geographic Information

- 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.6-8.7:**

Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

- **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.

- **CCSS.ELA-LITERACY.WHST.6-8.7:**

Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

- **CCSS.ELA-LITERACY.WHST.6-8.8:**

Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

NEXT GENERATION SCIENCE STANDARDS

- **CCSS.ELA-LITERACY.SL.7.1.B:**

Follow rules for collegial discussions, track progress toward specific goals and deadlines, and define individual roles as needed.

- **Crosscutting Concept 1:**

Patterns

- **Crosscutting Concept 2:**

Cause and effect: Mechanism and prediction

- **Crosscutting Concept 4:**

Systems and system models

- **Crosscutting Concept 7:**

Stability and change

- **Disciplinary Core Ideas LS2: Ecosystems, Energy, and Dynamics:**

- **Disciplinary Core Ideas LS3: Earth and Human Activity:**

- **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

- **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 2:**

Developing and using models

- **Science and Engineering Practice 4:**

Analyzing and interpreting data

- **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

- Markers
- Paper
- Writing utensils
- Scissors

REQUIRED TECHNOLOGY

- Internet Access: Required
- Tech Setup: 1 computer per classroom, 1 computer per pair, Printer

PHYSICAL SPACE

- Classroom

GROUPING

- Small-group work

RESOURCES PROVIDED: HANDOUTS & WORKSHEETS

- [Human Impacts Map Layer Know and Need to Know Chart](#)
- [Human Impacts Map Layer Rubric](#)

RESOURCES PROVIDED: MAPS

- National Geographic: MapMaker 1-Page Maps

BACKGROUND & VOCABULARY

Background Information

Mapping animal migration is an important way to understand more about the animals, their movement pattern, and their global relationship. Additionally, creating and reading maps are important skills, and help students to simplify complex patterns and gain new perspectives. Spatial representations are important tools students can use to aid in memory and learning. Utilizing different maps (e.g., state, country, and world maps) not only help students learn geographical information, but help them to understand geographic perspective and scale.

Prior Knowledge

Recommended Prior Activities

- [Collision! Human Impacts on Animal Migration](#)
- [Create an Animal Migration Map](#)
- [Create an Ecosystem Map Layer](#)
- [Exploring Solutions to Human Impacts on Animal Migration](#)
- [Interactions Among Organisms in Ecosystems](#)
- [Tracking Animal Migration](#)
- [Why and How Animals Migrate](#)

Vocabulary

Term	Part of Speech	Definition
animal migration	<i>noun</i>	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.
detour	<i>noun</i>	unplanned or temporary path.
distract	<i>verb</i>	to divert or draw attention away from something.
effect	<i>noun</i>	result or impact produced by an action.
evidence	<i>noun</i>	data that can be measured, observed, examined, and analyzed to support a conclusion.
feasible	<i>adjective</i>	possible.
focal	<i>adjective</i>	central and important.
impact	<i>verb</i>	to influence or have an effect on something.
key	<i>noun</i>	an explanation of symbols and abbreviations used on a map, also known as a legend.
map	<i>noun</i>	symbolic representation of selected characteristics of a place, usually drawn on a flat surface.
map layer	<i>noun</i>	part of a map representing specific features of a place.
measure	<i>verb</i>	to determine the numeric value of something, often in comparison with something else, such as a determined standard value.
migration pattern	<i>noun</i>	predictable movements, in time and space, of a group of animals or people.
scale	<i>noun</i>	distinctive relative size, extent, or degree.
solution	<i>noun</i>	an answer to a problem.

Term	Part of Speech	Definition
stakeholder	noun	person or organization that has an interest or investment in a place, situation, or company.

For Further Exploration

Articles & Profiles

- [National Geographic: Nature's Most Impressive Animal Migrations](#)
- [The Nature Education Knowledge Project: Animal Migration](#)
- [National Geographic: What a Trip! The Toughest Animal Migrations on Earth](#)

Books

- [W. W. Norton & Company: Where the Animals Go](#)

Instructional Content

- [National Geographic: Ecosystems Collection](#)
- [National Geographic: Human Impacts on the Environment Collection](#)

Websites

- [National Geographic: Resource Library: Animal Migration](#)
- [Arboretum, University of Wisconsin-Madison: Journey North](#)
- [Idaho Public Television: Animal Migration!](#)
- [National Geographic Kids: Animals](#)
- [National Geographic: Animals](#)

