

RESOURCE LIBRARY | ACTIVITY : 2 HRS 30 MINS

# Taking a Stand Against Human Impacts on Animal Migration

Student groups research, gather, and organize evidence to support an argument, using their unit project maps as a key piece of evidence. In their final presentation, groups take a stand against a human impact on animal migration and attempt to convince stakeholders to implement their recommended solutions. Student groups will evaluate each other's presentations from the perspective of stakeholders.

## GRADES

6, 7, 8

## SUBJECTS

*Biology, Ecology, Conservation*

## CONTENTS

4 PDFs

## OVERVIEW

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For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/taking-stand-against-human-impacts-animal-migration/>

In collaboration with

# DIRECTIONS

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

## I. Introduce evidence-based arguments.

- Explain to students that they will prepare and present an evidence-based argument that takes a stand on human impacts on animal migration.
- On the board, define more clearly each of the following components of an evidence-based argument:
  - **Question:** *Why should your recommended solution(s) to animal migration be implemented by your stakeholders?*
  - **Claim:** *What is your answer to the question? Your claim should state your position. For example, “[Our recommended solution] is effective because it will...”*
  - **Evidence:** *What data supports your claim? You should have multiple pieces of evidence gathered from your research.*
  - **Reasoning:** *How does your evidence support your claim? You should provide reasoning for all evidence.*
- Show the [Wildlife Crossings Stop Roadkill. Why Aren't There More?](#) video. As the video is playing, encourage students to identify the question, claim, evidence, and reasoning from the video. As a class, have students share what they have identified.
  - **Question:** Why aren't there more wildlife crossings when they have been shown to prevent roadkill?
  - **Claim:** Wildlife crossings prevent roadkill, but they are expensive to install. When design solutions are identified that are more cost effective, more wildlife crossings can be built.
  - **Evidence:** Wildlife crossings that are already made (like in Banff, Canada), tracking data that show individual animals using the crossings, camera trap videos showing different kinds of animals using the crossings. When a cheaper design solution was identified through a design contest, Colorado agreed to install it.
  - **Reasoning:** Data show that wildlife crossings are effective, and that states agreed to install a wildlife crossing when the cost was more reasonable. This shows that when wildlife crossings become more affordable, more will be built.

- Ask students: *Why are evidence-based arguments important?* (They support critical thinking, provide support for making decisions and forming opinions, and help to express content knowledge in an accurate and fair way.)

## 2. Prepare groups for their final presentation.

- Distribute the *Presentation Rubric* to each student and orient students to expectations.
- The objective for the presenting group is to convince key stakeholders (role-played by their classmates) that they should implement their recommended solution.
  - The stakeholders will be identified and defined by student groups, and will be portrayed by another student group that will evaluate their argument during presentations. Each student in the listening group will evaluate from the perspective of one stakeholder.
  - To be successful at this presentation, groups will need to think from the perspective of different stakeholders, and provide evidence and reasoning to support their claims.
  - Groups will research, gather, and organize evidence to support their argument. Their completed unit project maps, with its animal migration base layer, ecosystem layer, and human impact layer, will act as a key piece of evidence for their argument.
- The objective for the listening group is to decide, from each stakeholder's perspective, whether they should approve the solution recommended, whether they should offer revisions, or whether they will not approve the solution.
  - Whatever they decide, they must provide reasoning to back up their decision. Each stakeholder's reasoning will be a part of the presenting group's assessment, and the reasoning for the stakeholder's decision should be persuasive and fair (e.g., stakeholders cannot just say "because we think so.").
- Orient students to the presentation method and parameters.

## 3. Guide groups to identify their stakeholders.

- Distribute the following documents to each group:
  - *Sample Stakeholder Descriptions*
  - *Stakeholder Descriptions and Evaluations*

- Ask students to retrieve their *Exploring Solutions to Animal Migration Problems* handout.
  - This was completed during the *Exploring Solutions to Human Impacts on Animal Migration* activity. Students will use this handout now to guide how they identify and define their stakeholders.
- Allow students to read the *Example Stakeholder Descriptions* handout and work in their groups to complete the stakeholder descriptions on the *Stakeholder Descriptions and Evaluations* handout.
- After students have completed this, collect their *Stakeholder Descriptions and Evaluations* handout and, while they are working on their presentations, make enough copies for the listening group (e.g., if there are four students in every group, four copies should be made so that each student can represent a different stakeholder).

#### **4. Support groups in preparing their arguments and presentations.**

- Prompt students to retrieve all of the completed handouts, thought organizers, *Know & Need to Know* charts, and all other articles, videos, encyclopedic entries, and resources used throughout the unit.
- Set boundaries for students on how much additional research is expected. Encourage students to limit their research to only what is necessary to support their arguments. As needed, provide instruction for effective online research and online literacy.
- As students are working, remind them to keep in mind the different stakeholders they are trying to convince. Make sure that for every different claim they make (which may be a different claim for each different stakeholder) there is evidence to support their claim.
- Focus students' research with questions like:
  - *What pieces of evidence are you using to support your claim? How many pieces of evidence do you have to support your claim? Is that enough to convince all stakeholders?*
  - *Do any of your stakeholders need to see different kinds of evidence to be convinced?*
  - *How does this piece of evidence support your claim? What is the reasoning behind this?*
  - *How are you going to present all of this information in a clear way?*
  - *Do you have any visuals or pictures to support your textual evidence?*

#### **5. Facilitate group presentations.**

- Distribute the corresponding, now completed, *Stakeholder Descriptions and Evaluation* handouts to each group that will be acting as listening groups during a presentation. (Each presenting group should have one listening group, and each group should act as a listening group at least once.)
- Remind non-participating groups that they should still be actively listening to the presentations.
- Orient stakeholder groups to their roles. Each member of the group will act as a different stakeholder. If there are more group members than stakeholders, students can work as teams or there can be duplicate stakeholders.
  - Reminder: Their objective is to decide, from the stakeholder’s perspective, whether they should approve the recommended solution, offer revisions, or reject the solution. Reasoning must be provided for all decisions.
- Presenting groups will be evaluated by the teacher using the *Presentation Rubric* and by the listening group with the *Stakeholder Descriptions and Evaluations* handout.
- Determine in advance whether the stakeholder groups will share their thoughts out loud with presenting groups, or whether the feedback will be written on the handouts.

## **6. Reflect on the project.**

- Invite volunteers to share their reflections, thoughts, and changes in thinking regarding the unit. To close, ask students to share actions or behaviors they feel would minimize human impacts on animal migration.

## **7. Prepare to execute the opportunity for further action.**

- Now that the unit is over, prepare your class to execute further action to continue student momentum toward helping end the negative impacts of humans on animal migration and extend the impacts of their project work into the local or global community.
  - 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.

# Rubric

Students will be assessed on their presentations by their teachers and by their peers. A rubric is used to standardize this assessment.

## Extending the Learning

Have students write a research paper making the argument that changes to physical or biological components of an ecosystem affect populations.

## OBJECTIVES

## Subjects & Disciplines

### **Biology**

- Ecology
- Conservation

## Learning Objectives

Students will:

- Create and present an argument that aims to convince four stakeholders to implement a recommended solution.
- Identify and define four stakeholders whom they aim to convince.
- Gather and organize evidence to support their argument.

## Teaching Approach

- Project-based learning

## Teaching Methods

- Information organization
- Research
- Role playing

# 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
    - Social and Cross-Cultural Skills
- Critical Thinking Skills
  - Analyzing
  - Applying
  - Creating
  - Evaluating
  - Remembering
  - Understanding
- Geographic Skills
  - Analyzing Geographic Information
- Science and Engineering Practices
  - Asking questions (for science) and defining problems (for engineering)
  - Constructing explanations (for science) and designing solutions (for engineering)
  - Engaging in argument from evidence
  - 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.SL.7.4:**

Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.

• **CCSS.ELA-LITERACY.SL.7.5:**

Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

• **CCSS.ELA-LITERACY.SL.7.6:**

Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. (See grade 7 Language standards 1 and 3 here for specific expectations.)

• **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.

• **Speaking and Listening Standards 6-12:**

Comprehension and Collaboration, SL.7.3

## **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.

• **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

- **MS. Interdependent Relationships in Ecosystems:**

MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

- **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 7:**

Engaging in argument from evidence

## **Preparation**

## **What You'll Need**

## **MATERIALS YOU PROVIDE**

- Presentation materials for the chosen presentation medium
- 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

Teachers should decide what kind of presentation students will make and how long each group's presentation can be (depending on the number and size of groups). Possible presentation styles include using presentation programs or creating a poster or trifold display. Teachers should also decide how they would like students to cite or reference their sources.

## GROUPING

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

## RESOURCES PROVIDED: HANDOUTS & WORKSHEETS

- [sample Stakeholder Descriptions](#)
- [Stakeholder Descriptions and Evaluations](#)
- [Exploring Solutions to Animal Migration Problems](#)
- [Presentation Rubric](#)

## BACKGROUND & VOCABULARY

### Background Information

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, there are many individuals and organizations that 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. When considering possible solutions, it is important to take into account not only what is good for the animal, but also what would be most successful for the widest variety of stakeholders. Constructing arguments from the perspective of different stakeholders can help students gain important skills in empathy and forethought.

## Prior Knowledge

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## Recommended Prior Activities

- [Collision! Human Impacts on Animal Migration](#)
- [Create a Human Impacts Map Layer](#)
- [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.
approve	<i>verb</i>	to accept or allow something.
argument	<i>noun</i>	reason or set of reasons given with the aim of persuading others that an action or idea is right or wrong.
claim	<i>verb</i>	to state as the truth.
component	<i>noun</i>	part.
detour	<i>noun</i>	unplanned or temporary path.
distract	<i>verb</i>	to divert or draw attention away from something.
evidence	<i>noun</i>	data that can be measured, observed, examined, and analyzed to support a conclusion.
impact	<i>verb</i>	to influence or have an effect on something.
implement	<i>verb</i>	to carry out plans.

Term	Part of Speech	Definition
migration pattern	noun	predictable movements, in time and space, of a group of animals or people.
perspective	noun	point of view or way of looking at a situation.
reasoning	noun	process of using evidence to make inferences or conclusions using logic.
revise	verb	to correct or improve an existing material, often a written document.
solution	noun	an answer to a problem.
stakeholder	noun	person or organization that has an interest or investment in a place, situation, or company.

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## For Further Exploration

### Instructional Content

- [National Geographic: Protecting Biodiversity in the Amazon Rainforest](#)
- [National Geographic: Human Impacts on the Environment Collection](#)

### Websites

- [National Geographic: Resource Library: Animal Migration](#)



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