

Mapping Human Interruptions to Migration

Students learn how human activity has impacted animal migration. They begin by watching a video of elk migration through Yellowstone National Park to understand what animal migration is, why elk migrate, how far they travel, and why humans should care. They then imagine themselves back in time and think about how they would adapt the land to better meet the evolving needs of their developing community. Finally, students learn more about specific ways people have altered the environment, explore one geographic area in the United States, and map the human activity in that region. This lesson is part of the [Interrupted Migrations unit](#).

GRADES

6, 7, 8

SUBJECTS*Biology, Ecology, Conservation, Geography, Social Studies***CONTENTS**

3 Activities

In collaboration with



ACTIVITY 1: INTERSECTING ACTIONS | 1 HR
40 MINS

DIRECTIONS

This activity is part of the [Interrupted Migrations unit](#).

1. Activate students' prior knowledge with a brief Turn-and-Talk with a neighbor about the meaning of migration.

- Set the stage for students by telling them that they may have heard the term migration used in different ways. We often hear about the migration of people. In this unit, we will be learning about animal migration.
- Ask students to discuss with a neighbor:
 - *What is animal migration?*
 - *What kinds of animals migrate?*
 - *Why do you think animals migrate?*
 - *How far do you think animals migrate?*

2. Students watch a video to learn about elk migration behaviors.

- In this video, students learn about one species of migratory animals, the elk that migrate through Yellowstone National Park.
- As a class, watch [Yellowstone's Great Migration](#). As they watch, have students listen for and take notes about the following:
 - *What is migration?*
 - *Why do the elk migrate?*
 - *How far do the elk migrate?*
 - *Why does tracking and mapping the elk matter?*

3. Lead students on an imagined journey through the Yellowstone landscape to think about human impacts on that environment.

- Divide students into six groups—these will be the groups that students work in for the duration of the unit. Distribute a set of [Human Impact Cards Set 1](#) to each group and give students a few minutes to review the cards.
- Display an image of Yellowstone National Park, such as [this image](#) of a Bull Elk from the National Park Service. Remind students that the boundary of Yellowstone in the video was surrounded by unprotected land that has been, to some extent, developed by humans.
- Ask students to imagine that they have traveled back in time and that they are in the scene of the photograph, which is *near* the border of Yellowstone, but *outside* of what is now the national park before any development has happened.

- Ask: *What do you think it looked and sounded like to be in a place like that?* After a few minutes of quiet thinking, elicit several student responses.
- With the image of Yellowstone still displayed, follow the [Creating Our World Transcript](#) to guide students through an imagined journey.
 - Stop at each question so teams can decide which card best fits the human impact that is being described.
 - Pause to discuss the implications as prompted in the transcript.

4. Guide students in a discussion about the benefits of development.

- Ask students: *What are some of the ways human lives are impacted by the kinds of developments highlighted in the Creating Our World exercises you just experienced?* (possible responses: roads, dams, fences, landfills, urban sprawl).
- Have students look through their *Human Impact Cards Set 1*. Ask students:
 - *How is your life made easier by the human impacts listed on your cards?*
 - *What are some drawbacks to these human impacts?*
 - *How do you think the elk surrounding Yellowstone might have been impacted as towns and roads started to appear?*
- Record student responses on chart paper.

5. Introduce the *Interrupted Migrations* unit final project.

- Explain to students that people may sometimes develop areas only thinking about human benefits, but not thinking about the impact on animals and the environment. In this unit, students will design and construct a board game that teaches players about the impact of human activities on animal migration and inspires them to take action to protect migrating animals.
- Explain that students have already created the first pieces of their games—the *Human Impact Cards Set 1*.
- Discuss with students how games can be an engaging way to teach people about issues.
- Allow students to explore the following online games about migrating birds as examples:
 - Audubon Society's [Mission Migration Game](#)
 - National Zoo's [Migratory Birds Game](#)

6. Create a class Know and Need to Know chart.

- Elicit responses to the unit driving question, *How can human activities help or hinder animal migrations*, by having students discuss with a partner:
 - What do we already know about how human activities impact animal migrations?
 - What do we need to know about human activities and animal migrations in order to develop a game about this problem that we can share with our community?
- Have students share their thoughts in a whole-class discussion, recording their ideas on a class Know and Need to Know chart. Keep the chart in a visible place in the classroom, or easily accessible online, to refer to students' expertise and questions with which they started off the unit.

Tip

Step 3: Continue to remind students to use the *Human Impact Cards Set 1* to respond to the questions posed as the story progresses.

Modification

Step 3: To give students more autonomy, the Creating Our World exercise can be independently conducted in each small group. Assign one student to be the reader while the others respond to the questions and create the cards.

Tip

Step 5: Access the games prior to class to ensure you have any necessary plug-ins for play.

Informal Assessment

Creating Our World: The Know and Need to Know chart assesses students' content knowledge and their understanding of the purpose and requirements of the project.

OBJECTIVES

Subjects & Disciplines

Biology

- Ecology
- Conservation

Geography

Social Studies

Learning Objectives

Students will:

- Understand what animal migration is through the case of Yellowstone elk.
- Explore different ways humans have impacted the environment and animal migrations.
- Identify how human actions can change physical environments.

Teaching Approach

- Project-based learning

Teaching Methods

- Brainstorming
- Cooperative learning
- Multimedia instruction

Skills Summary

This activity targets the following skills:

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

- Analyzing
- Remembering
- Understanding

National Standards, Principles, and Practices

COMMON CORE STATE STANDARDS FOR ENGLISH LANGUAGE ARTS & LITERACY

• 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.

THE COLLEGE, CAREER & CIVIC LIFE (C3) FRAMEWORK FOR SOCIAL STUDIES STATE STANDARDS

• D2.Geo.4.6-8:

Explain how cultural patterns and economic decisions influence environments and the daily lives of people in both nearby and distant places.

Preparation

BACKGROUND & VOCABULARY

Background Information

Humans have changed the natural world in many ways. Some of the most relevant changes have included building cities, creating spaces for agriculture and grazing, and energy production. These actions have largely benefited human populations, but these changes have also had increasingly dire consequences for the migrations of a wide range of animals. Whether the species impacted is the Arctic tern and its lengthy migration over multiple continents, or the lesser-known vertical migration of ocean plankton, when the natural world is changed, migration is changed too, and the outcome for the entire ecosystem can shift. As humans have changed the natural world, the natural corridors for animal migration shift or are closed. Loss of migratory routes has a negative impact on migratory species.

Prior Knowledge

Recommended Prior Activities

- None

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.
corridor	noun	hallway, or connecting passage of land.
migration	noun	movement of a group of people or animals from one place to another.
range	noun	agricultural land where livestock graze.

ACTIVITY 2: GEOGRAPHY MATTERS | 50 MINS

DIRECTIONS

This activity is part of the [Interrupted Migrations](#) unit.

1. Introduce students to their focal geographic areas for the project.

- For their game, students will be focusing on a particular area of the United States. Remind students how many elk migration routes crossed through the Yellowstone area of the United States. Similarly, the focal area for each group's game may not encompass the entire migration route of animals in that area, but migration routes will begin, end, or pass through the area.
- Divide students into six groups and use the *Geographic Area Information Sheets* to assign student groups to the different geographic areas. The six areas are:
 - [The Sonoran Desert Borderlands](#)
 - [The Chesapeake Bay Region](#)
 - [The Snake River](#)
 - [Gulf Coast](#)

- [Altamont Pass Wind Resource Area](#)
- [Hudson River Estuary](#)

2. Students read about the geographic regions in the United States.

- Explain to students that geographers have categorized the United States into regions. This means that the places in a region share common geographic characteristics.
 - An example of this would be a desert region, which includes all the places in the desert, even if they cross national boundaries or state lines. A single place can also be part of multiple regions because many places have multiple geographic characteristics.
- Have students think back to the [Yellowstone's Great Migration](#) video. Just as it was important to consider the geography beyond Yellowstone to understand elk migration patterns, groups will need to consider the larger region beyond their focal area to better understand animal migrations.
- Have students use the [North America: Physical Geography](#) encyclopedic entry to identify which region their assigned geographic area is in.
- Then, have students read about their region on their *Geographic Area Information Sheet*, annotating for key information that will help them create their games.
 - As students are reading, have them look for: geographic features, human impacts on land, and important information about wildlife.

3. Students complete their second set of *Human Impact Cards*.

- Distribute the [Human Impact Cards Set 2](#) to each group of students. Have groups select from the deck of cards ones that are relevant to their geographic area based on the information they read.
- Have students fill out the back of the cards they selected with answers to the following two questions:
 1. How does this type of human impact benefit people?
 2. How does it change the environment?

4. Students write a geographic description of their area to contribute to their game board development.

- Games often provide descriptions of the setting in which the game takes place. This helps players understand and visualize things about the setting that might not appear on the game board.
- Have student groups write a one-paragraph summary of their geographic area that includes the following information:
 - Region in the United States
 - Climate
 - Key geographic features
 - Human impacts/developments
 - Wildlife in the area

Tip

Step 2: If students are not familiar with annotation techniques, you may want to teach them the following three annotation symbols: 1) identify important information with a check mark; 2) circle key vocabulary; 3) put a question mark next to words, phrases, or sections that are confusing.

Informal Assessment

Summary Paragraph: This brief writing assignment assesses student understanding of geographic content, including regions, geographic features, climate, human development, and regional wildlife.

OBJECTIVES

Subjects & Disciplines

Geography

Social Studies

Learning Objectives

Students will:

- Research geographic areas and corresponding regions of North America with text sources.

Teaching Approach

- Project-based learning

Teaching Methods

- Reading
- Research
- Writing

Skills Summary

This activity targets the following skills:

- Critical Thinking Skills
 - Applying
 - Remembering
 - Understanding
- Geographic Skills
 - Acquiring Geographic Information
 - Organizing Geographic Information

National Standards, Principles, and Practices

COMMON CORE STATE STANDARDS FOR ENGLISH LANGUAGE ARTS & LITERACY

- CCSS.ELA-LITERACY.RH.6-8.7:

Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

- CCSS.ELA-LITERACY.W.6-8.2:

Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

Preparation

BACKGROUND & VOCABULARY

Background Information

As a field of study, regional geography is focused on the specificity of regions around the world. It highlights what is unique about social and environmental relationships that occur in these different regions. By studying geographic content within various regions, it is possible to see how regional habitats are unique. We can also examine how animals might move across or between regions during their migration journeys. Ecosystems studied in regional geography have different needs and specifications, which are impacted by human activity. Understanding how geographic information impacts the way systems work together may prove essential to preserving and restoring animal migratory routes.

Prior Knowledge

Recommended Prior Activities

- [Intersecting Actions](#)

Vocabulary

Term	Part of Speech	Definition
climate	<i>noun</i>	all weather conditions for a given location over a period of time.
migration	<i>noun</i>	movement of a group of people or animals from one place to another.
region	<i>noun</i>	any area on Earth with one or more common characteristics. Regions are the basic units of geography.
regional geography	<i>noun</i>	branch of geography devoted to the study of characteristics of a specific region.
wildlife	<i>noun</i>	organisms living in a natural environment.
Yellowstone National Park	<i>noun</i>	large national park in the U.S. states of Wyoming, Idaho, and Montana.

ACTIVITY 3: MAP THAT GAME BOARD | 50 MINS

DIRECTIONS

Interrupted Migrations Unit Driving Question: *How can human activities help or hinder animal migrations?*

Mapping Human Interruptions to Migration Unit Driving Question: *How has human activity changed the environment?*

1. Introduce mapping techniques to students.

- In this activity, students create maps of their geographic areas that will become their game boards. To introduce mapping techniques, show students the [North American Species Migration Map](#).
- Have students discuss the map in their groups by answering the following questions:
 - *What features stand out to you on this map?*
 - *Why are those features important?*
 - *Think about your geographic area. What important features would you want to include on your maps?*

2. Prepare groups to use MapMaker Kits to create boards for their games.

- Provide each group with the printed pages from the [United States Tabletop Map Part 1](#) and the [United States Tabletop Map Part 2](#) from the [United States MapMaker Kit](#). Have students use the printed PDFs (there are 16 pieces total) to create their tabletop map.
- Have students use [Google Maps](#) or an atlas to locate their focal geographic area on their region map and draw a bright border around it on their tabletop map.
- Then, have groups use their *Geographic Area Information Sheets* and summary paragraphs from the [Geography Matters](#) activity to add additional features to their maps. Each map should include:
 - A border for their geographic focus area

- A key
 - Cardinal points
 - Political boundaries labeled
 - Major cities labeled
 - Watershed and waterways (if applicable) labeled
- Next, have groups use their completed *Human Impact Cards (Set 1 and Set 2)* and [Google Earth](#) to visually explore their focus area more closely. In their groups, have students complete the following on their map:
 - Identify at least five human activities that could threaten animal migration.
 - Mark each human activity site on their map and include a brief description of the activity and its impact.

3. Guide groups through informal peer assessment of their maps.

- Once the maps are complete, have each group use the [Initial Game Board Design Checklist](#) to ensure they have all the required elements.
- Then, have groups pair up and use the same checklist to give informal feedback on another group's map.

4. Revisit the Know and Need to Know chart.

- As a class, revisit the Know and Need to Know chart started in the [Intersecting Actions](#) activity. Read through the Need to Knows and put a checkmark next to the points that students have learned throughout this first lesson.
- Elicit any new Need to Knows that have surfaced for students. Guide students to think about what they will need to know in order to be successful in completing their unit project. Add these new ideas to the chart.

Modification

Step 2: An alternative to the printed tabletop kits is for students to use an online map-making tool like National Geographic's [MapMaker Interactive](#).

Modification

Step 2: If internet access is not available, print an aerial Google Earth view of each region for the students. Ensure the Google Earth map shows names and markers of sites when printed.

Tip

Step 3: If this is the first time students have given peer feedback, use a feedback protocol with sentence stems to scaffold their discussion and support useful feedback.

Informal Assessment

Initial Game Board Design Checklist: Use the checklist to assess whether groups have included the specified geographic information and whether their map demonstrates an understanding of each component.

OBJECTIVES

Subjects & Disciplines

Geography

Social Studies

Learning Objectives

Students will:

- Locate and identify human impacts on a particular geographic area of the United States.
- Create a map of key geographic features and human developments in a particular area of the United States.

Teaching Approach

- Project-based learning

Teaching Methods

- Hands-on learning
- Research

- Self-directed learning

Skills Summary

This activity targets the following skills:

- Critical Thinking Skills
 - Analyzing
 - Applying
 - Creating
 - Remembering
 - Understanding
- Geographic Skills
 - Acquiring Geographic Information
 - Analyzing Geographic Information
 - Answering Geographic Questions
 - Asking Geographic Questions
 - Organizing Geographic Information

National Standards, Principles, and Practices

COMMON CORE STATE STANDARDS FOR ENGLISH LANGUAGE ARTS & LITERACY

- CCSS.ELA-LITERACY.RH.6-8.7:

Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

THE COLLEGE, CAREER & CIVIC LIFE (C3) FRAMEWORK FOR SOCIAL STUDIES STATE STANDARDS

- D2.Geo.1.6-8:

Construct maps to represent and explain the spatial patterns of cultural and environmental characteristics.

Preparation

BACKGROUND & VOCABULARY

Background Information

As a field of study, regional geography is focused on what is unique about the social and environmental relationships that occur in specific locations. Conservationists map migratory paths in particular regions and can sometimes learn about global migration patterns by focusing on those that occur regionally. By studying animal migration in various regions it is possible to see how and why animals might move across or between regions during their migratory journeys. Some conservationists focus, in particular, on how human impacts in a region may negatively impact animal migration.

Prior Knowledge

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Recommended Prior Activities

- [Geography Matters](#)
- [Intersecting Actions](#)

Vocabulary

Term	Part of Speech	Definition
border	<i>noun</i>	natural or artificial line separating two pieces of land.
cardinal direction	<i>noun</i>	one of the four main points of a compass: north, east, south, west.
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.
mapping	<i>noun</i>	making and using maps.
map symbol	<i>noun</i>	representation of one piece of data displayed as part of a larger representation of spatial information.
political boundary	<i>noun</i>	imaginary line separating one political unit, such as a country or state, from another.

Term	Part of Speech	Definition
region	<i>noun</i>	any area on Earth with one or more common characteristics. Regions are the basic units of geography.
regional geography	<i>noun</i>	branch of geography devoted to the study of characteristics of a specific region.
watershed	<i>noun</i>	entire river system or an area drained by a river and its tributaries.
waterway	<i>noun</i>	body of water that serves as a route for transportation.



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