



## Learning Activity:

### The Great Monarch Migration

Activity Type	Geography and map creation
Focus Areas	Social studies, science
Time Required	30–45 minutes

## Overview

The nearly 3,000-mile journey that monarch butterflies make during their migration is one of the most incredible behaviors observed throughout the animal kingdom. To gain a deeper understanding of the migration route and its impact on the monarch butterfly, students will create a map that tells the story of this long journey. If technology allows, students can participate in an interactive game on the [WWF Together app](#) to learn about a monarch's stamina, and test their own speed against that of fluttering monarch wings.

## Objective

### At the completion of the activity, students should be able to:

- Map the migration route of monarchs, including the areas they travel between and stops they make along the way.
- Describe the threats to monarchs' migration patterns and how these threats affect their population.
- Explain the importance of monarch migration and what we can do to help.



*A monarch butterfly on a roost tree in Michoacán, Mexico.*



## ● Subject and Standards

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### C3 Framework for Social Studies State Standards

- D2. Geo.1.3-5: Construct maps and other graphic representations of both familiar and unfamiliar places.
- D2. Geo.2.3-5: Use maps, satellite images, photographs, and other representations to explain relationships between the locations of places and regions and their environmental characteristics.
- D2. Geo.3.3-5: Use maps of different scales to describe the locations of cultural and environmental characteristics.

### Next Generation Science Standards

- 3-LS4-3 Biological Evolution: Unity and Diversity
  - Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
- 3-LS4-4 Biological Evolution: Unity and Diversity
  - Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.
- 4-ESS2-2 Earth's Systems
  - Analyze and interpret data from maps to describe patterns of Earth's features.

## ● Materials Needed

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- Copies of student map worksheet (included in this activity)
- Pencil
- Colored pencils
- Smartphones or iPads (if available)
- [Monarch Educator's Resource Guide](#) (for reference)



## ● Vocabulary

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- **Adaptation:** changes to a plant or animal that make it better equipped to survive under the conditions of its environment
- **Agriculture:** the process of farming soil, producing crops, and raising livestock
- **Climate change:** a change in climate over time due to natural causes or human activity
- **Deforestation:** the conversion of forest to another land use or the long-term reduction of the tree canopy cover; this includes conversion of natural forest to tree plantations, agriculture, pasture, water reservoirs, and urban areas
- **Grassland:** a landscape (also known as a prairie) that has too little rain for trees to grow in great numbers but instead has grass and grass-like plants that grow close to the soil
- **Habitat:** a natural environment in which plants and animals live, breed, and get their food, water, and shelter
- **Herbicide:** a chemical substance used to destroy or stop plant growth
- **Hibernation:** a period of rest or inactivity, usually during winter
- **Migration:** the act of passing periodically from one region or climate to another for feeding or breeding
- **Near Threatened:** a species that is close to meeting the threatened classification or that would be threatened if not for conservation efforts
- **Pollination:** the transfer of pollen from male plant parts to female plant parts, resulting in fertilization, fruits, and seeds
- **Sustainable:** of, relating to, or being a method of harvesting or using a natural resource so that the resource is not depleted or permanently damaged; an effective and innovative way to efficiently use natural resources and ensure their continued supply





## ● Activity Procedure

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### Part 1: Introduction and Preparation

- Start the discussion by asking students to define migration. Migration is an example of an animal adaptation, a behavior passed down through generations that helps the species survive. Animals that migrate exhibit this behavior for different reasons—most often to avoid a changing climate, to look for food, or to reproduce. Encourage students to name examples of species that migrate.
- Explain to students the significance of the monarch migration. During the spring and summer months, there is a large population of monarchs dispersed throughout areas of the northern United States and southern Canada. As fall approaches, these monarchs set out on the nearly 3,000-mile journey to the forests of central Mexico that will provide them with shelter from the winter cold. The butterflies will hibernate in these forests for several months until the temperature indicates it is safe for them to emerge. Then they will begin the journey home, traveling north, stopping to reproduce along the way. What makes the migration pattern of monarchs so unique and fascinating is not only the vast distance covered, but the fact that it takes several generations of butterflies to complete the journey from start to finish in one year. This means that each butterfly is traveling a route that it has never seen before and that the butterfly completing the cycle by arriving back home is several generations beyond the original butterfly that began the journey. Describe to the students this migration route taken by many monarchs so they fully understand the concept. It may help to display your own map and refer to it while explaining.
  - First leg: Fall is approaching, temperatures are dropping, and monarch butterflies throughout the northern United States and southern Canada are heading out on a long journey. This generation of butterflies is responsible for traveling all the way to the forests of the Monarch Butterfly Biosphere Reserve in Michoacán, Mexico, to hibernate in Mexico's warm climate and avoid the harsh cold of winter. Once their winter hibernation is over and temperatures indicate spring has arrived, typically by March, these butterflies will awake and begin the journey north.
  - Second leg: As this generation of butterflies heads north, they will stop to eat and reproduce along the way, laying eggs along milkweed plants. This generation lives the longest, about seven or eight months, hence why they're referred to as the "super generation". After a few weeks of traveling north, these butterflies reach Texas and die, leaving a new generation to emerge from their eggs and continue the journey north.



- Third leg: This next generation of butterflies will continue to travel north for about four to five weeks, stopping in various states along the way to eat and lay eggs, before eventually dying. Their offspring will emerge and continue the journey from where their parent butterflies left off for approximately four to five weeks before dying.
- Fourth leg: This pattern happens one or two more times, resulting in a fourth or fifth butterfly generation completing the last leg of the journey to areas of the northern United States and Canada where they rest and reproduce during the warm months. One of the most popular areas for monarchs during the summer is the grasslands of the Northern Great Plains, spanning Nebraska, North Dakota, South Dakota, Wyoming, and Montana in the United States, as well as Saskatchewan and Alberta in Canada. These grasslands provide ideal habitat for monarchs to feed and lay eggs.
- Emphasize to students the relevance of this monarch migration to people. Monarchs are pollinators, responsible for transporting pollen between flowering plants, fertilizing them. The plants then produce seeds and fruit, all of which humans use to make various food products. Without monarchs and other pollinators, a lot of the food we routinely depend on would not exist. It's important for monarchs to complete their migration cycle with the necessary habitat to reproduce and continue their role of pollinating.



**Monarch Butterfly Fall & Spring Migrations**

→ Fall Migration

→ Spring Migration

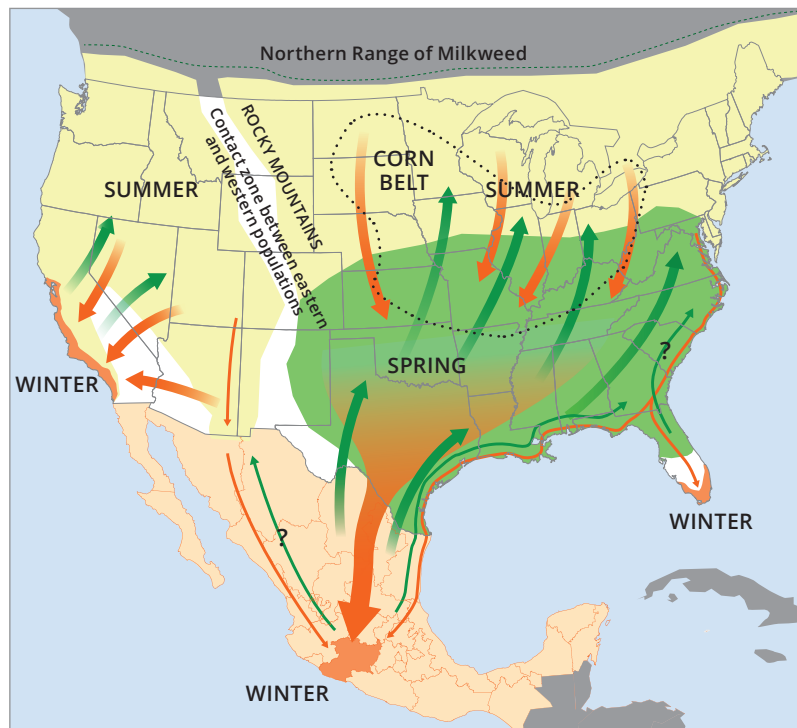
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Summer Breeding Areas

Spring Breeding Areas

Overwintering Areas

Corn Belt High Monarch Production







## Part 2: Activity

In order to understand the geographical significance of the monarch's efforts, students will create maps that chart the butterflies' migration pattern.

- Distribute the student map handout included in this activity, as well as coloring utensils, to each student.
- Now that they are familiar with the migration pattern of monarch butterflies, instruct students to be creative and incorporate the information to illustrate this route on their map. Their maps should include the following:
  - Michoacán, Mexico, the location of the Monarch Butterfly Biosphere Reserve and the place where many monarchs spend their winters
  - The states and provinces that comprise the Northern Great Plains, where many monarchs spend their summers (Nebraska, North Dakota, South Dakota, Wyoming, and Montana in the United States; Saskatchewan and Alberta in Canada)
  - The migration steps discussed at the beginning of the activity, showing the multiple generations of monarchs and the directions they travel, estimating the distance covered by each as they complete their leg of the journey
  - A legend, including symbols to represent the directional flying routes, seasons, the monarchs themselves, forests, grasslands, etc.



*Colony of monarch butterflies overwintering in Michoacán, Mexico.*



### Part 3: Discussion and Assessment

- Although monarchs themselves are not considered an endangered species, their migration route is classified as near threatened by the International Union for Conservation of Nature due to habitat loss in both Mexico and the United States. Unsustainable use of forests in Mexico, including conversion for agriculture and illegal logging, has diminished the region's forested areas. In the United States, grasslands are also converted for agriculture and are treated with herbicide, eliminating monarch caterpillars' primary food source (milkweed) and disrupting the butterflies' ability to reproduce. Share with students what WWF is doing to help restore monarch migration routes and ways they can help too.
  - WWF is helping educate people on the importance of these forest and grassland regions and is encouraging sustainable forestry and agriculture. By adopting more efficient ways of using our natural resources, people can continue to rely on forests and grasslands, but in a way that doesn't harm species and their habitats.
  - Students can help monarchs by planting milkweed native to their region in a garden at home or school. This will provide monarchs with a place to lay their eggs and will provide a food source for emerging caterpillars along the monarchs' migration journey.
  - Everyone can help by changing the way they think about food. The increased demand for food has resulted in the loss of much of the land that monarchs rely on. By limiting the amount of food we put on our plates, as well as consciously repurposing leftovers, we can make a big difference for monarch habitat.
- Ask students to consider other possible threats to monarchs in addition to habitat loss. Monarchs are sensitive to temperatures and cannot fly if their body temperature is less than 86 degrees. To warm up, they will try to sit in the sun or "shiver" their wings. Challenge students to think of reasons why it's important for monarchs to be able to fly and how effects of climate change (fluctuating temperatures, irregular rainfall and humidity, and increased extreme weather events) may affect their ability to fly, ultimately impacting their survival. You can find more information on threats to monarchs in the [Monarch Educator's Resource Guide](#).
  - If technology is available, have students explore the monarch segment of the [WWF Together app](#). Encourage students to participate in the interactive challenge to understand the stamina and effort monarchs must exert to complete their migration. Monarchs flap their wings five to 12 times per second, approximately 720 times per minute. Understanding the distance these butterflies travel, combined with how quickly they must flap their wings, students can imagine how hard monarchs must work in order to complete their migration!



## Extended Learning Options

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- Rather than use the attached student handout, you may choose to provide students with blank paper for them to draw their own outline of North America.
- Suggest that students incorporate the monarchs' role of pollination in their maps as well. This could be represented by a symbol in the states the butterflies visit in the spring and summer. In addition, you may choose to have students label each state in the United States, specifying with a designated color the ones where monarchs are found throughout their journey.
- Encourage students to research other migration routes of monarchs. The most frequently observed route is from their hibernation forests in Michoacán, Mexico, to areas spread throughout the northern United States and southern Canada. However, there are populations of monarchs known to travel other routes, including to areas of southern California. Students can also research the migration patterns of other species and compare them to those of monarchs.
- Tie this activity to another from the [Monarch Butterfly Toolkit](#), such as the “Origami Butterfly Planters” arts and crafts activity or the “Flutters and Flowers” game to have students learn more about the importance of monarchs and how to help them along their migration route.
- For a more in-depth look at the impact of food production, use the [Food Waste Warrior Toolkit](#) to lead students in a project to determine the amount of food waste occurring in their own school.
- Start a class fundraiser to protect monarch butterflies and other wildlife and their habitats using WWF's online fundraising tool. Learn more at [worldwildlife.org/pages/fundraise-for-wwf](http://worldwildlife.org/pages/fundraise-for-wwf).

## Additional Background Info

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You can use the information found at the links below to enhance your discussion with the class, or you may want to share some links directly with students if you determine they are grade-level appropriate.

- **Article:** [Extreme Weather Threatens Monarch Butterfly Habitat](#)—describes the impacts of climate change on the forests of Mexico
- **Article:** [Monarch Butterflies and Climate Change](#)—a report that assesses the vulnerability of monarch butterflies to the resulting effects of climate change
- **Article:** [As Monarch Butterflies Lose Ground in Mexico, WWF Seeks Solutions in America's Heartland](#)—touches on the work of WWF to restore the grasslands of America's Northern Great Plains

For more fun classroom activities with a focus on wild species and conservation, visit [wildclassroom.org](http://wildclassroom.org).

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Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Mapping Monarch Migration

Use what you've learned about monarch migration to show the steps of their round-trip journey on the map below. Remember to include a legend that defines every symbol you use.

