



# Monarch Tagging

**Grade:** 2nd  
**Group Size:** 1 class

**Season:** Aug. 15 – September 30  
**Ratio:** 1:5, adults to children

**Time:** 1 ½ hours

## For the Teacher:

<b>Overview</b>	As a large group or class, students will brainstorm questions they have about tagging monarchs. In small groups and partners, they will search for, capture, tag, and release migrating monarchs in the prairie with the help of parent chaperones and PWLC staff. As a small group, they will record their observations on a data sheet and share their results with the larger group. Lastly, they will discuss the results of their investigation.
<b>Subjects Covered</b>	Science, Language Arts
<b>MN Science Standards Supported</b>	Helps support three standards. See section “Minnesota Academic Standards in Science”
<b>Skills Used</b>	Investigating, questioning, identifying, exploring, observing, concluding, recommending, team work, following directions, humane treatment of live animals (and other skills depending upon student questions)
<b>Performance Objectives</b>	After completing this activity, students will be able to... <ul style="list-style-type: none"> <li>• Differentiate between monarch and viceroy butterflies</li> <li>• Differentiate between male and female monarch butterflies</li> <li>• Demonstrate how to humanely capture a live monarch butterfly</li> <li>• Ask questions about monarchs, make careful observations, and seek answers.</li> </ul>
<b>Vocabulary</b>	Insect, butterfly, monarch, investigation, nectar, migration, Mexico

## For the PWLC Instructor:

<b>PWLC Theme</b>	The Prairie Pothole Region
<b>Primary EE Message</b>	The prairie pothole region is valuable and in need of restoration and protection.
<b>Sub-message</b>	Wildlife: The prairie pothole region is home to a variety of resident and migratory wildlife.
<b>PWLC EE Objective</b>	<ul style="list-style-type: none"> <li>• Use scientific methodology to explore the environment (ask questions, hypothesize, collect data, analyze data, form conclusions, make recommendations).</li> <li>• Value and affect the prairie wetlands environment through their stewardship ethic.</li> </ul>
<b>Materials</b>	<ul style="list-style-type: none"> <li>• Insect nets, one per two students</li> <li>• Monarch, viceroy, painted lady, and red admiral butterfly visuals</li> <li>• Monarch tag visual</li> <li>• Monarch tags, data sheets, and clipboards for adult taggers</li> <li>• Clipboards, blank or recycled paper, and pencil, one each per small group</li> <li>• Easel, paper, and markers</li> <li>• Monarch puppet and flower petal necklace</li> </ul>
<b>Location</b>	Amphitheater and nearby prairie areas

## Background Information

During this field investigation, students have the opportunity to find and tag monarch butterflies, an insect species native to prairie wetlands. Using questions generated by students, students also conduct a monarch tagging investigation to attempt to answer

some of their questions.

Since 1998, the Prairie Wetlands Learning Center has partnered with the University of Kansas' Monarch Watch program to provide visitors with the opportunity of capturing, tagging, and releasing migrating monarch butterflies. Much of the information provided in this background section comes from the Monarch Watch web site, [www.monarchwatch.org](http://www.monarchwatch.org). Monarch Watch is an educational outreach program that engages citizen scientists in large-scale research projects. It involves more than 2,000 schools, nature centers, and other organizations in the United States and Canada, and an estimated 100,000+ students and adults participate in tagging activities each fall.

Tagging monarchs helps people monitor the success of their conservation efforts using real data collected by citizens in many locations. Although it seems like there are plenty of monarchs that gather to migrate each fall (up to 100 million), it might be hard to imagine they face any threat of serious population loss. However, monarch butterflies face a number of threats to their survival along their migration routes, in summer breeding areas, and in their wintering sites. In the U.S. and Canada where monarchs breed, they face direct habitat destruction caused by humans (new roads, housing developments, farming expansion). Monarchs are also impacted negatively by more subtle habitat destruction in the loss of their host plants. Monarch larvae feed exclusively on milkweed, which is considered a noxious weed to some people, and it is often destroyed. In some places across North America, milkweed plants are being severely damaged by ozone. Adult nectar plants and milkweed are also vulnerable to herbicides used by many landscapers, farmers, gardeners, and others. And monarchs themselves can be killed outright by many pesticides and vehicle collisions.

On their wintering sites, monarchs are even more vulnerable. Along with all monarchs in the eastern U.S., PWLC monarchs migrate to the Transvolcanic Mountains in Mexico, where there are only 11 to 14 known wintering sites each year. Each site is a few hectares in size and contains millions of monarch butterflies. This combination - a high concentration of individuals in only a few small sites - makes the possibility of habitat destruction in Mexico very serious. Local people log trees for lumber and use the cleared land for grazing cattle and growing food. Logging opens the forest canopy, making wintering monarchs more vulnerable to freezing. In December 1995, scientists estimate that five to seven million monarchs died after a snowstorm hit the wintering sites.

Conservation efforts have been partially successful but have not guaranteed the survival of one of the few migrating insects. Despite the establishment of five sanctuaries in 1985 and the opening of tourist trade, these efforts have not yet assured the continued survival of the wintering monarch population. Providing creative economic alternatives must be part of a successful solution. Here at home, we can help by planting and protecting native nectar plants and milkweed, and by capturing and tagging migrating monarchs to provide new data for scientists to use.

In 2006, our most recent year with available data, two monarchs tagged at the PWLC

were recovered from El Rosario, Mexico, 1,853 miles from the PWLC.

In the 10 years that the PWLC has tagged monarchs:

- People have tagged over 2,000 butterflies here.
- A total of 29 PWLC tags have been recovered; 28 of the tags were recovered from 3 separate places: Chincua, Cerro Pelon, and El Rosario, Mexico.
- The one tag not found in Mexico was recovered from a monarch in Lidderdale, Iowa, directly south of the PWLC.

We appreciate classes participating in this real-life scientific study!

### *Teacher Preparation*

We highly recommend conducting one or more of the suggested extensions before your visit in order to integrate this field investigation into the classroom study of animal life, insects, migration, life cycles, adaptations, or other topics. (See section, “Teacher-Led Extensions/Adaptations/Assessment Ideas.”)

### *PWLC Preparation*

PWLC staff purchase and provide monarch tags in advance for the class to use.

### *Field Investigation Procedure*

1. In the amphitheater or classroom, welcome students, teachers, and chaperones to the Prairie Wetlands Learning Center. Review rules for the trail.
2. Organize students into small groups, each led by a chaperone.
3. Ask students what they already know about monarchs and tagging them.
4. As you facilitate discussion, ask the teacher to record any questions students have about monarchs on an easel or white board. What do they wonder about them? What do they hope to find out by tagging monarchs today? What might they predict they will discover?
5. Distribute one clipboard, data sheet, and one pencil to each chaperone to carry for their small group. Set up a sample data sheet on the easel or white board for the chaperones to copy down on their clip board. Set-up of the data sheet should be directly related to the students’ unanswered questions. For example, you may divide the sheet into quadrants. In one quadrant you might record the total number of monarchs found; in another, the number of males and females observed. In the third quadrant, you might record the colors of the flower monarchs were observed using. The last quadrant might include discoveries, new questions, weather observations, or surprises.
6. Explain to students that they also have the opportunity to be scientists and search for monarchs to tag. Ask them why people tag monarchs.
7. Demonstrate how students should carry the nets upright, not over their shoulders where a sudden turn could accidentally hit another person with the hoop or handle. They should not use it as a walking stick. Students will work in pairs with each pair sharing one net.

8. With two student volunteers and props, demonstrate the best technique for capturing a monarch butterfly. They should wait until a monarch has landed on a plant and not chase flying monarchs as often depicted in cartoons. Approaching the monarch with the net turned for a narrow profile is less threatening than approaching the net turned for a wide view or fully extended. To do this, demonstrate how to pull the end of the net along the handle and how to gently but quickly extend it at the last second over the top the plant, capturing the monarch. Show them how to close the net with one hand below the monarch and pull the net off the plant.
9. Encourage them to protect the plants as nectar source for monarch when capturing them. They should try their best only to capture monarchs as other butterflies are frail and may be harmed by being caught in the nets.
10. Once students capture a monarch, their group should locate the PWLC staff person for tagging. Try to round up as many students as possible to observe the first monarch being tagged, in case no others are captured. The staff person will carefully remove the monarch from the net, record data about the monarch, tag it, and help the student who caught it to release it.
11. Students may walk off trail to search for monarchs, but they must stay with their partner and their chaperone. They must also stay somewhat close to the PWLC staff person because that person has the tags. Teachers experienced in tagging may also carry tags and use them. Students should try to avoid areas with a lot of thistles which tear nets and scratch skin. Provide chaperones with visual landmarks to use as boundaries. Tell chaperones how much time they will have to search for and tag monarchs and ask them to observe the time on their watches.
12. Distribute the nets. Allow students as much time as possible to find, capture, and tag monarchs. They should record their observations on the data sheet for their small group.
13. Meet back at the amphitheater or classroom at the appointed time. Collect the empty nets.
14. To wrap-up, ask each group to share their results with the rest of the class. Tabulate a class total of monarchs captured and other results using the data sheets and unanswered questions as a guide. If the class caught no monarchs, discuss why this happened. Was it related to weather conditions? To protocol? What suggestions would they have for doing this differently next time? Would the results be the same? Do they think monarchs and the prairie are important? If so, why? How can they be a friend to monarchs and the prairie?
15. Collect the clipboards and pencils. Teachers may collect the data sheets to bring back to school for further use. Thank everyone for coming and for their help! They are all citizen scientists making a difference for monarchs!

## *Weather Alternatives*

Field investigations take place rain or shine. Everyone should dress appropriately for the weather. In the event of unsafe weather (lightning, high winds) or pouring rain, everyone must come indoors. PWLC staff make every effort to make your travel worthwhile despite the weather and prepare indoor, age-appropriate activities. PWLC

staff welcome teacher input into these plans. Some possible alternatives might include:

- Go outside for a very short amount of time, even if only under the deck to view the prairie, wildflowers monarchs use, or to search for caterpillars.
- Tour the exhibit area and watch prairie wetlands videos with the objective of observing monarchs in the prairie in summer or fall.
- Read a story or watch a video on associated topics. The MN Monarch Watch video is an excellent choice. The following books would be appropriate: *A Monarch Butterfly's Life* by John Himmelman; *Starting Life, Butterfly* by Claire Llewellyn and Simon Mendez.
- Use a display board and corresponding insect body part visuals to help student differentiate between moths and butterflies. Sing the Insect Song (head, thorax, abdomen, etc.).
- Use the monarch floor puzzles or poster to help illustrate the life cycle of monarchs.
- Using creative movement, dramatize the life cycle of a monarch. Then make butterfly books depicting the life cycle of monarchs.
- Provide photos of monarchs, viceroys, red admirals, and painted ladies for students to make sketches, comparing and contrasting key features.

### *Teacher-Led Extensions/Adaptations/Assessment Ideas*

- To maximize outdoor classroom time at the PWLC, teachers may conduct steps 3 and 4 in the section "Field Investigation Procedure" at school. Upon arrival at the PWLC, teachers may provide PWLC staff with a written list of what students know and wonder for quick review before completing the remaining steps.
- Answer remaining questions that require further research using the Internet, library, or other sources of information. If you need assistance from PWLC staff, please let us know. We would be glad to assist you.
- Plant, care for, and observe milkweed and monarch nectar source flowers at school.
- Raise monarch caterpillars in class and release them in your pollinator garden at school. Be aware of proper timing to avoid late release and death!
- Study the life cycle of monarchs using story books such as *Becoming Butterflies* by Anne Rockwell. Other suggested titles are listed below in the Reference section.
- Integrate your study of monarch migration with geography, culture, and economics in social studies. For example, create or examine maps showing the locations of the PWLC; your school; Lidderdale, Iowa; and Chincua, Cerro Pelon, and El Rosario, Mexico. Search the Internet for images of these locations.
- Follow monarch migration on <http://www.learner.org/jnorth/monarch/index.html> and add your class' discoveries! When do you see your first monarch? Your last one? Your first egg, caterpillar, or chrysalis?
- Observe monarchs at their wintering sites in Mexico. Visit Monarch Live! A Distance Learning Adventure, <http://monarch.pwnet.org/>
- Find out more about tagging monarchs. Visit Monarch Watch, Kansas Biological Survey, University of Kansas, [www.monarchwatch.org](http://www.monarchwatch.org)

## Minnesota Academic Standards in Science

This lesson helps support the following state standards.

### Strand I. HISTORY AND NATURE OF SCIENCE

#### Substrand A. Scientific World View

**Standard:** The student will understand that science is a human endeavor practiced throughout the world.

**Benchmark 1.** The student will recognize that repeating a scientific investigation will lead to very similar results.

**Benchmark 4.** The student will recognize that everyone can do science and invent things and ideas.

#### Substrand B. Scientific Inquiry

**Standard:** The student will raise questions about the natural world, make careful observations and seek answers.

**Benchmark 1.** The student will use appropriate tools to gather and organize data.

**Benchmark 2.** The student will recognize and describe patterns in data.

### Strand II. PHYSICAL SCIENCE

#### Substrand A. Structure of Matter

**Standard:** The student will understand that objects can be sorted and classified based on their properties.

**Benchmark 1.** The student will sort and classify objects in terms of color, size, shape, weight, texture, flexibility and attraction to magnets.

## RESOURCES

### For Adults:

- Monarch Butterfly Royal Mail, a Manual for the Environmental Educator by Proteccion de la Fauna Mexicana (Profauna A.C.)
- Nature's Partners: Pollinators, Plants, and You, A Pollinator Protection Education Project by Richard C. Ponzio, Ph.D and Ella R. Madsen, M.S.
- The Monarch Butterfly, Biology and Conservation, Karen S. Oberhauser and Michelle J. Solensky, editors
- Journey North, Monarch Butterfly, <http://www.learner.org/jnorth/monarch/index.html>
- Monarch Live! A Distance Learning Adventure, <http://monarch.pwnet.org/>
- Monarch Watch, Kansas Biological Survey, University of Kansas, Dedicated to Education, Conservation, and Research, [www.monarchwatch.org](http://www.monarchwatch.org)

### For Children:

- A Monarch Butterfly's Life by John Himmelman
- Becoming Butterflies by Anne Rockwell
- Caterpillars, Bugs, and Butterflies by Mel Boring, page 31
- Creepy, Crawly Caterpillars by Margery Facklam, pp. 26-27
- Butterfly by Claire Llewellyn
- Butterfly Count by Sneed B. Collard III

- Insectigations, 40 Hands-On Activities to Explore the Insect World by Cindy Blobaum, pages 5 and 107
- Madalynn the Monarch Butterfly and Her Quest to Michoacan by Mary Baca Haque (translated in Spanish as well)
- Starting Life, Butterfly by Claire Llewellyn and Simon Mendez

## *Credits*

This field investigation was developed and written by Prairie Wetlands Learning Center Staff, U.S. Fish and Wildlife Service. Thanks to Prairie Science Class naturalist Tia Thysell for reviewing this lesson plan. Thanks to the following teachers for reviewing this lesson plan: Renee Larsen, Adams Elementary, Fergus Falls; Gay Eckberg, West Central Area Schools; and Deborah Strege, licensed teacher, Fergus Falls.