

## DESIGNING A POLLINATOR HABITAT

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#### Unit Overview

In this integrated unit, first-graders learn English language arts, math, and science standards by exploring the monarch butterfly species and the basic needs of plants. Working collaboratively, students conduct research to understand the causes behind the dwindling monarch population and investigate ways to increase it. Using their research and ideas, students design a habitat to attract the monarchs and other pollinators. The unit culminates with students presenting their habitat designs to their classmates, parents and school community.

#### Standards Addressed

1. **M.1.MD.2:** Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.
2. **S.1.L.1:** Obtain, evaluate, and communicate information about the basic needs of plants and animals.
  - c. Design a solution to ensure that a plant or animal has all of its needs met.
3. **ELA.1.RI.1:** Ask and answer questions about key details in a text.
4. **ELA.1.RI.2:** Identify the main topic and retell key details of a text.
5. **ELA.1.RI.7:** Use illustrations and details in a text to describe its key ideas.
6. **ELA.1.SL.2:** Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
7. **ELA.1.SL.5:** Add drawings to other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.
8. **ELA.1.W.2:** Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure.

## Day 1 – Introduction to the Monarch Butterfly

**Standards Addressed:** 3, 5, 6

**Essential Question:** What is a monarch butterfly?

1. Begin the lesson by completing a KWL (what I **K**now, What I **W**ant to learn, what I **L**earn) chart as a class. Ask the guiding question: “What do I **k**now about the monarch butterfly?” As students respond, record responses in the **K**now column.
2. Next, ask the question, “What do I **W**ant to learn about the monarch butterfly?” As students respond, record responses in the **W**ant to learn column.
3. Read aloud *Monarch Butterflies* by Gail Gibbons. Make sure to draw student attention to illustrations depicting the various life stages of butterflies. As you read the book, check students’ understanding by asking questions such as: “What plant does the monarch lay its egg in?” “Why doesn’t the rain wash away the egg?” “What is another name for the caterpillar?”
4. Review the following vocabulary from the book: *milkweed*, *egg*, *caterpillar*, *chrysalis*, *adult*, *metamorphosis*.
5. Distribute the **Life Cycle of a Monarch Butterfly Cutouts** to pairs of students. Working in pairs, students will cut out the images on page two and paste them in the correct order on page one. While they work, encourage students to use *Monarch Butterflies* as a resource. Ask students questions like: “How do you know this stage is stage one?”

### A NOTE FROM THE TEACHER

*If you have access to monarch caterpillars, engage students on day one by having them observe monarch caterpillars on trays exploring/ eating milkweed plants/ leaves. Throughout the unit, students can track the growth of the caterpillars using nonstandard units of measurement or rulers.*

## Day 2 – Life Cycle of the Monarch Butterfly

**Standards Addressed:** 4, 5

**Essential Question:** What is the life cycle of a monarch butterfly?

1. Ask students to recall the book *Monarch Butterflies* by Gail Gibbons from day one. Ask students to retell what the book was about aloud. Continue the KWL chart as a class by completing the **L**earn column of the chart. Ask students to specifically recall details that they learned through the text and the activity they completed.
2. Using the **Monarch Butterfly Labeling Activity**, cut out the pictures and labels and put in baggie. Make sure you have enough baggies for all of the groups. Working in groups, have

students put the pictures in sequential order, then place labels underneath each picture. When they are finished, one student representative from each group will raise their hand to indicate to the teacher that they have completed the assignment. As you visit each group, confirm the correct order and ask probing questions about the stages, such as “What happens during the chrysalis stage?” After you confirm the correct order, one student representative will gather the cutouts and put them in the baggie.

3. After each group completes the ordering activity and you confirm the correct order, students will independently complete the **A Butterfly is Born Activity Sheet**. Students will color pictures, cut them out, and glue them in the correct order in their science journals. To the right of the glued picture, students will label the stage and briefly explain what happens in the stage. You will collect the science journals at the end of the lesson and assess for understanding.

### **Day 3 – Migration of the Monarch Butterfly**

**Standards Addressed:** 6

**Essential Questions:** What is the annual migration cycle of the monarch butterfly?

1. Show [“The Annual Cycle of the Monarch Butterfly”](#) slideshow. Using the slideshow’s map, explain where Mexico is located. Explain that the monarch migrates in response to the changing seasons. As you go through the slideshow, reference Georgia’s seasonal changes as it relates to the monarch butterfly’s migration patterns. Specifically, explain that when it gets cooler in Georgia, the monarch butterfly seeks a warmer climate. Then they move back up north as the climate gets warmer. Review the four-stage life cycle once again (slide six).
2. Show the [“Visit to the Monarch Sanctuary”](#) video. As students view the video, ask them to record their observations and any questions they may have in their science journals. At the end of the video, ask some guiding questions about the video, such as: “Where did it look like the butterflies spend their time?” “What colors were the butterflies?” “Why do you think all the butterflies were clustered together?” “What do you think would happen if too many tourists started visiting the sanctuary?”

### **Day 4 – Threats to the Monarch Butterfly**

**Standards Addressed:** 6

**Essential Questions:** What types of threats do monarch butterflies face?

1. Introduce the problem of the declining monarch butterfly population. Tell students that scientists have discovered that the monarch butterfly population is declining and they are trying to understand why. Ask students to think about other plants and animals that they

have heard of going extinct or becoming endangered. As a whole class, ask students to brainstorm reasons they think the butterfly population may be declining. Record student responses on the board.

2. Read through the overview about the declining monarch butterfly population from [Journey North, “Why the Decline?”](#). Specifically, go over the content under the heading “Past Decade: Downward Trend,” and review the challenges on breeding grounds and on wintering grounds. Explain the following factors:

- Breeding grounds: a) new agricultural practices means that chemicals are being sprayed on the milkweed, which is killing the plant. Ask students to recall what they have learned about the monarch butterfly’s life cycle. Ask what they think would happen if the milkweed plant were destroyed; b) discuss changing weather patterns and how the heat is impacting their breeding cycle.
- Wintering grounds: a) define and discuss *deforestation*. Ask students to recall from the video from day two why deforestation might threaten the butterfly; and b) define and discuss that ecotourism means tourists visiting the grounds. Ask students to brainstorm why too many tourists may threaten the monarch butterfly population.

## Day 5 – Writing about the Monarch Butterfly’s Threats

**Standards Addressed:** 3, 4

**Essential Question:** What are some of the threats that monarchs face?

1. Ask students to recall the lesson from day four. Ask students probing questions, such as: “Why are the monarchs disappearing?” and “What do you think would happen if they all disappeared?” Explain to students that, today, they will be conducting research to learn more about Monarch butterflies.
2. Using the **Graphic Organizer**, model how to take research notes. You can use any topic to model this process, but it may be best to use a nonfiction article or text that your students are familiar with. The students should follow along with you as you model.
  - a. As a class, read the article or text you selected aloud.
  - b. If needed, remind or discuss the following terms with students: *topic, main idea, details*.
  - c. As a class, decide on the article or text’s *topic*, and write it in the appropriate space.
  - d. As a class, decide on the article or text’s *main idea*, and write it in the bubble.
  - e. As a class, pick out three *details* from the article or text and write one detail in each box.

- f. Finally, ask the students if they noticed any unknown words as they read the article or text. Write those words in the word bank.
3. Students will now work in pairs to conduct their research and take research notes on the **Graphic Organizer**. Consider pairing students based on ability levels. More advanced readers can use the **Monarch Butterfly Article** to complete the graphic organizer. Other readers can use the [Wintering Grounds in Peril video](#) to complete the graphic organizer. Alternatively, the students can use both resources or you can create your own articles or videos based on your students' needs and ability levels.
4. Remind students that, as they research, they should complete the graphic organizer in the same way that you modeled this process for them. At the end, students will write about what they learned in the space provided on the graphic organizer. Although they are working in pairs to conduct the research, each student will complete a graphic organizer.
5. Students will present their findings to the class. Ask probing questions, such as “are scientists doing anything to solve this problem?” “How many monarchs are dying because of this threat?” “Can you think of a solution to the problem?” Make sure to clarify any misconceptions that students seem to have in their explanations.

## Day 6 – Basic Needs of a Plant and Pollinators

**Standards Addressed:** 2, 5, 6, 7

**Essential Questions:** What are the basic needs of a plant and what are pollinators?

1. Use the **Basic Needs of a Plant** resource to discuss the needs of a plant with students
2. Distribute the **Basic Needs of a Plant Activity Sheet** for students to complete and put in their science journals.
3. Bring students to an outdoor area populated with plants. Have students observe and record notes in their science journals about whether the plants they are observing are receiving all of the basic needs. Have students record where plants are located in their science journals.
4. Bring students inside and ask students to share out their observations. Ask probing questions, such as: “Are the plants getting enough sunlight?” “What do you think would happen if plants did not get enough

### A NOTE FROM THE TEACHER

*At M.H. Mason, we are fortunate to have an outdoor classroom where students can observe plants. If you do not have an outdoor classroom, you can take your students to anywhere that plants are growing. Alternatively, you can plant your own container garden outside.*

sunlight?” “What do you think would happen if the plants did not get enough water? “Do the plants look like they need some room to grow or are they on top of one another?” “What do you think would happen if the plants didn’t have enough room to grow?”

5. Introduce pollinators and their importance to our environment by showing the [Flower Reproduction](#) video. After the video, focus in on the pollinator’s role of transporting the seeds. Explain that the monarch butterfly is only one type of pollinator. Then, have the class brainstorm what other types of insects or animals might also be pollinators. Go through [What is Pollination Diagram](#) with the whole class. At the bottom of the diagram, point out the other types of pollinators.

## Day 7 – Georgia Pollinators

**Standards Addressed:** 2, 3

**Essential Question:** What are some important Georgia pollinators and what plants do they pollinate?

1. Have students recall the following questions from day six: what is a pollinator? Why are pollinators important? What are some examples of pollinators in Georgia? What are some plants that pollinators use in Georgia? Call on students with a raised hand to share out.
2. Put students in groups of three or four. Assign student groups a pollinator that can be found in Georgia (such as bat, bee, caterpillar, state butterfly, bird). Groups can use [PebbleGo](#) to find at least three host plants that are pollinated by their assigned insect or animal. Students will record the findings in their science journals.
3. Each group will present their findings to the class. Ask probing questions about the plant and animal/insect.

### A NOTE FROM THE TEACHER

*Alternatively, you could differentiate this lesson by placing students in similar-ability groups. Then you could provide articles written at different levels for the various insects or animals. I recommend [Nensela](#), which provides articles that are differentiated based on Lexile scores.*

## Day 8 – Designing the Pollinator Habitat, Part I

**Standards Addressed:** 2, 7, 8

**Essential Question:** What type of plants do we want in our pollinator habitat?

1. Introduce the Designing a Pollinator Habitat Project to students. Explain to students that over the next week or so they will work in groups to design a pollinator habitat. On the final day, they will present their designs to the class and school community.

2. Distribute the **Designing a Pollinator Habitat Project Booklet** to each student. Introduce the project by talking through the questions on the **Pollinator Habitat Design Project Brief**, located on page one of the booklet. Have students practice their reading skills by having students read one sentence or question aloud to the class.
3. Review the **Plants in My Pollinator Habitat Activity Sheet**. Specifically, explain they will spend day one researching the types of plants they want to include in the habitat. Students will research using [Journey North](#), [National Geographic Kids](#), and, if you have access, [PebbleGo](#), and/or the [Power Knowledge Life Science](#). Explain that students should also review the notes in their science journals from the research they conducted about host plants and pollinators (day seven). They must work as a group to select plants using the following rules:
  - a. The habitat must have three types of plants;
  - b. The plants must attract pollinators; and
  - c. The plants must be Georgia plants.
  - d. Each student must complete the **Plants in My Pollinator Habitat** activity sheet in the **Designing a Pollinator Habitat Project Booklet**.
4. As students are working, circle the room to check for understanding and provide help when needed.
5. Collect the **Designing a Pollinator Habitat Project Booklets** at the end of class for safe-keeping.

## Day 9– Designing the Pollinator Habitat, Part II

**Standards Addressed:** 1, 2, 7

**Essential Question:** How can we design a habitat that attracts pollinators and meets the needs of plants?

1. Distribute the **Designing a Pollinator Habitat Project Booklets** to each student.
2. As a whole group, ask students to recall some of their research from the previous day. Ask questions, such as: “What types of plants would you include in your habitat?” “What are the needs of the plant?” “What types of pollinators will these plants attract?”
3. Tell students to turn to the **Pollinator Habitat Design** activity sheet in their **Designing a Pollinator Habitat Project Booklets**.

4. Tell students that as a group, they will brainstorm what they want to include in their pollinator habitat. As a whole class, review day six notes and drawing from the outdoor activity, and discuss what things plants need to grow (food, sunlight, water, and space).
5. Explain that they must give each plant enough room to grow by measuring approximately how much space the plants will need. Students must decide how many much space they want to leave between the plants. Before they begin the group work, model how to use measuring blocks to measure the distance between where the plants will be plotted on the chart paper in the final design. Ask probing questions about plants needing room for growth.
6. After brainstorming as a whole class, each student will sketch a habitat design in the space provided on the **Pollinator Habitat Design** activity sheet.
7. Groups will then work together to decide which design they like best or what elements they want to incorporate from each team member's design. After you approve each group's design, the group will receive one piece of large graph paper and work together to draw the design to scale. Students must also label the plants and other items in their pollinator habitat.
8. Collect the **Designing a Pollinator Habitat Project Booklets** and students' drawings at the end of class for safe-keeping.

**A NOTE FROM THE  
TEACHER**

*If you prefer, you can allow students to spend several days working on their designs and answering the questions. Depending on your students, you might also allow them to work at their own pace – spending more time on specific parts of the project as needed.*

### **Day 10– Designing the Pollinator Habitat, Part III**

**Standards Addressed:** 2, 8

**Essential Question:** How did we design our habitat and why?

1. Distribute the **Designing a Pollinator Habitat Project Booklets** to each student.
2. As a class, discuss students' designs. Ask the class to recall what they included in their design.
3. Explain students will reflect individually on the design process by answering the four guiding questions in the **Designing the Pollinator Habitat** activity sheet:
  - a. Describe your group's pollinator habitat;
  - b. Why did your group design the habitat in this way?
  - c. What do you like about the habitat?



- d. What would you change about the habitat?
4. Students should share their responses with their group members.
5. Collect the **Designing a Pollinator Habitat Project Booklets** at the end of class for safe-keeping.

### Day 11– Designing the Pollinator Habitat, Part IV

**Standards Addressed:** 2, 8

**Essential Question:** What types of pollinators would my habitat attract and why?

1. Distribute the **Designing a Pollinator Habitat Project Booklets** to each student.
2. Explain that students will individually answer questions about the pollinators and plants they selected from the **Our Plants and Pollinators** activity sheet:
  - a. What types of plants did you select for your habitat?
  - b. What pollinators would your habitat attract?
  - c. Would your habitat meet the needs of the plants? How do you know?
  - d. Why is it important to build the pollinator habitat?
3. Collect the **Designing a Pollinator Habitat Project Booklets** at the end of class for safe-keeping.

### Day 12– Preparing to Present the Pollinator Habitat

**Standards Addressed:** 2, 7, 8

**Essential Question:** What was my group’s design process?

1. Explain that groups will be presenting their designs to the class and school community tomorrow. Review the **Pollinator Habitat Design Presentation** sheet with students before presentations begin. Have a different student read each of the requirements, including.
  - a. Every group member must speak;
  - b. You must have your chart paper with the completed habitat design;
  - c. Each group member must be prepared to answer questions about the pollinator habitat;
  - d. Each group member must turn in their completed habitat booklets at the end of class; and
  - e. Be prepared and confident when presenting.

#### A NOTE FROM THE TEACHER

##### – EXTENSION ACTIVITY

*If you have access to space and materials, you can build a pollinator habitat with your class. Have your class (or the school community) vote on the best design to use as the blueprint. If the habitat is a success, you can apply for [Pollinator Habitat Certification](#).*

2. Give students time in class to practice their presentations. Circle the room to provide support and feedback where needed.

### **Day 13 – Presentation Day!**

1. Students will present their pollinator habitats to their classmates, parents, and school community.
2. Use the **Pollinator Habitat Design Rubric** to grade the final designs and presentations. Please note that you should complete a rubric for each student rather than for each group.

#### **A NOTE FROM THE TEACHER – EXTENSION ACTIVITY**

**If you have the time at the end of the unit, you may want to create a symbolic monarch to send to Mexico.** See [Symbolic Migration Teacher Packet](#).

1. Introduce [ambassadorship with Mexico](#). Tell students they are about to design a Symbolic Butterfly that will travel to Mexico as an ambassador. Explain that the role of an ambassador is to cultivate friendship and build cooperation. Use students' familiarity with friendship and cooperation to help them understand ambassadorship.
2. Show [“A Day in the Life of a Student”](#) slideshow.
3. Show [butterflies American and Canadian](#) children made last year. How do they communicate friendship? What pictures, language, and symbols do they include in their design?
4. Teacher will brainstorm with students about what to include in their designs. Our butterflies will travel to Mexico to represent our class in friendship and be an ambassador for monarch conservation.
  - What do friends share? (games, favorite foods, music, holidays).
  - What's unique about our school, state, country, and culture?
  - What do we want to show with our butterfly? (friendship, appreciation, interest in monarchs)
  - How can we show our interest and concern for monarch butterfly conservation? (milkweed, flowers, butterfly garden, oyamel fir trees, other habitat features)
  - Remind students that the children who will receive your butterfly speak Spanish, not English. See [sample Spanish phrases](#).
5. Now students are ready to make their own monarch ambassador.