Lesson: Count the Pollinators

Time Needed: 50-55 minutes

Lesson Summary	In this lesson, students head outdoors to observe and tally local pollinators, using a simple data collection sheet. They practice close observation skills and data collection, helping them understand pollinator diversity and behavior in their local habitat, as well as the interdependence of pollinators and plants in real time.
Lesson Driving Question:	What types of pollinators live near us, and how can we observe and understand their activity?
Materials Needed	Slides Other Materials: ● Per Student: ○ Gaia Scholastic's Count the Pollinators Activity ○ Clipboard ○ Pencil ● Stellaluna book or play the Read Aloud ● Class set of colored pencils ● Gaia Scholastic's Padlet for more information on nature journaling ● Optional: Magnifying lenses ● Optional: Rulers for students who could benefit from an extension ● Optional: Field guides (#s 2, 3, 4, 10, 11, 14, 15 in particular)
Teacher Preparation	1. Print enough copies of the Count the Pollinators Activity prompts for each student. 2. Put prompts on Clipboards. 3. Choose your observation area. 4. Optional: gather additional nature journaling supplies (colored pencils, rulers, magnifying lenses) in a bin to bring out separately. 5. Brief students on outdoor safety and respectful observation behavior. 6. ***Note: conduct this activity sometime in the Spring or Summer.* a. *Optional: continue this data collection for a number of days or weeks following this Lesson to observe any seasonal changes in Pollinators as flowers bloom.*

Standards & Vocabulary

Aligned Science Standards:

- **SC.2.2.2:** A range of different organisms lives in different places.
  - **SC.2.2.2.a:** Make observations of plants and animals to compare the diversity of life in different habitats.

Aligned English Language Arts Standards:

- **CCSS.ELA-LITERACY.W.2.8**: Recall information from experiences or gather information to answer a question.

Aligned Math Standards:

- **CCSS: 2.NBT.A.2:** Count within 1000; skip-count by 5s, 10s, and 100s.
- **CCSS: 2.NBT.B.8:** Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.
- **CCSS: 2.OA.C.3:** Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two

equal addends.

Aligned Art Standards:

- **Standard 1. Observe and Learn to Comprehend:**
  - **1:** See oneself as a participant in visual art and design by experiencing, viewing, or making. 3. Practice critical and analytical skills by using academic language to discuss works of art and visual culture.
  - **6:** Create works of visual art and design that demonstrate increasing levels of expertise in skills and techniques for personal and/or professional endeavors.

Vocabulary

1. **Data:** A collection of information gathered by observation, questioning, or measurement.
2. **Habitat:** The place where a plant or animal lives and finds everything it needs to survive, like food, water, and shelter.
3. **Interdependence:** How different organisms in a habitat rely on each other for things like food, shelter, and even helping each other grow.
4. **Nectar**: A sweet liquid that flowers make. Pollinators, like butterflies, bees, and hummingbirds, drink nectar for their food.
5. **Observe:** To watch and notice something carefully, using your senses.
6. **Pollen:** A powder that flowers make. Pollinators carry it from flower to flower. When it lands on a new flower, it helps the plant grow seeds.
7. **Pollinator:** An animal, like a bee, butterfly, bat, bird, or moth, that helps plants make seeds. It moves pollen from one flower to another, which helps the plant grow and make new plants.
8. **Tally**: A mark used to count or keep track of something.

Formative Assessment/Check for Understanding

Assessment Options:

1. Student tally charts (check for correct tallying and participation).
2. Group discussion responses.
3. Observation of student participation and ability to differentiate pollinators.

Scaffolds & Supports

Scaffolds & Supports:

- Model tallying other examples (i.e. favorite flavor of ice cream within the class from a given list, etc.) on a whiteboard beforehand.
- Optional assigned heterogeneous pairs.
- Opportunity to draw and record notes in Count the Pollinators Activity activity.
- Print the Word Wall words for students as an additional support.

For Enrichment:

- Have students write a short observation report or field note.
- Introduce more complex species of pollinators (i.e. hoverflies,

Extension/Side Hike Ideas

Math:

- Create individual bar graphs for each Pollinator, comparing student tallies.

Science, Technology, & Data Collection:

- Repeat the Pollinator count across several days or weeks to observe seasonal change. This would be especially effective in the Spring and Summer!
  - Create individual bar graphs comparing student tallies for each Pollinator over time to quantify differences in pollinator populations in relation to seasonal changes and floral blooms.
- Add citizen science opportunities using apps like Merlin Bird ID, eBird, and iNaturalist!

English Language Arts & Art:

- Challenge students to make Pollinator Trading Cards! Each student makes a card with Pollinator stats: name, size, food, habitat, cool

honey possums, etc.). ● Let students take digital photos to create a class field guide. ● Research the conservation status of each pollinator and learn about its preferred habitats and what it needs to survive.	fact, a picture, etc. Trade cards with peers to practice oral language skills. <u>Green Career Pathways:</u> ● Explore the role of Wildlife Biologists in relation to counting the population sizes and observing population trends among different species in our green spaces.

Lesson Plan Step-by-Step	
Engage *15 Minutes*	1. Gather in a Learners Circle to discuss the Science Fact of the Day. 2. Explain that we're about to study a major pollinator: bats! 3. Read the Stellaluna book or play the Read Aloud (embedded on Slide 1) as an example of one of the pollinators we'll be exploring today. a. SEL Connection: lead a brief discussion about who Stellaluna's community was, what the conflict was, the similarities and differences between birds and bats, and how the bird and bat communities worked together to make everyone feel a sense of belonging. 4. Explain that today, we'll be working like Wildlife Biologists to count the populations of different pollinators we see in our own backyard!
Guide New Learning *20 Minutes*	1. Pass out a Count the Pollinators Activity, clipboard, and pencil to each student. 2. Head to your outdoor site (schoolyard, garden, or field) and model how to collect data by being present and using our senses in our very own sit spots. a. Students should bring their clipboards and pencils outside and set them down where they have access to lots of pollinators. 3. Set a timer for 15 minutes. Tell students that we will be tallying and recording observations for the entirety of the 15 minutes. Explain that to be good scientists, we have to be invisible in nature (so we should be as quiet and move as little as possible) so the organisms we observe feel safe. a. Students quietly observe and tally sightings for each pollinator type. b. Encourage them to write or draw additional notes (i.e. plant visited, color, shape of plant, behavior of pollinator, etc.) on the back of their sheet. c. Remind them that not seeing something is still data! d. Optional: Pair students for support. 4. Optional: use recommended Field guides, magnifying lenses, and rulers for precise data collection.
Reinforce & Reflect *10-15 Minutes*	1. Return to the classroom and gather in a Learners Circle for a class debrief. 2. Prompt students to share their tallies on Slide 2. 3. Have a brief discussion about the data collected (and the data collection process) using the below guiding questions: a. Why might our data be different from each other? i. Why is it important to collect multiple data sets? b. Which pollinators did we see most?

	c. Which pollinators did we see least? i. You likely didn't see as many moths or bats, because they're more active at night. Discuss how we see different organisms at different times of day and year, based on their adaptations, behavior, and seasonal changes. d. How would our tally change if we collected this data at night? e. How would our tally change if we collected this data in the winter? f. What did you notice about the different shapes of flowers? i. Did certain pollinators prefer certain flowers over others? ii. Why do you think that is? iii. Where did we see the most activity?