



Pollinators in the Garden

Connected Next Generation Science Standards

3-LS4-2 Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Featured Science and Engineering Practice

Constructing Explanations

Featured Cross-Cutting Concept

Structure and Function

Overview

Students will investigate the number and location of pollinators in the garden. From their data, they will determine how animal and plant adaptations affect survival. This lesson works best as a series of short, weekly lessons in the garden.

Students will

- Identify pollinator adaptations in the garden.
- Observe pollinators and analyze why pollinator numbers change.
- Describe and compare the traits of plants that pollinators most frequent.

Teacher Preparation

- Identify areas in the garden where high numbers of native or ornamental flowers are found for students to use as research sites.

Guiding Question - How does the environment influence the number of pollinators in a habitat?

Explore

- Ask students on the way out to the garden, *What pollinators have you noticed in the garden? Where do you usually see garden pollinators?*
- Define **adaptation** and have students brainstorm a few examples of garden animal and plant adaptations.
- Explain that today the students will be **entomologists** (insect scientists) and investigate pollinator adaptations. Ask students, *How do you think entomologists act, so they can observe pollinators, such as butterflies, bees, and moths?* Explain they will need to be calm, quiet, and sneaky, so the insects do not fly away.
- Have each student create a chart in their science journal or use the Pollinator worksheet.



Pollinators in the Garden

Materials

- Access to flowering plants
- Garden journals or worksheets and clipboards
- Air thermometer
- Pencils
- *Optional* - Butterfly nets, insect identification book, magnifying glasses, garden signs

Setting

- School garden or green space where students can observe a variety of living organisms.
- In St. Louis, this activity works best August- October.

Change the focus of this lesson by having students make a prediction if the number of pollinators will increase, decrease, or stay the same over time. Students can also just choose and observe at one pollinator study site instead of two.

Between observation days, allow students to use either insect identification books or internet resources to find the species of pollinators they see in the garden.

- Divide the class into groups of 3 or 4. Each group should discuss and write down a prediction of where they think they will observe the most pollinators.
- If you have butterfly nets or magnifying glasses, distribute them.
- Record the date and temperature as a class.
- In their small groups, allow students to choose two research sites and record the plants located at the site. Emphasize they do not need to know plant names, just describe the types of flowers and leaves (color, size, number of plants, etc). Decide if you want the research sites a specific size.
- Start the pollinator observations. Give students 5-10 minutes to quietly observe the pollinators that visit their first research site. Using their data collection sheets, they should tally the number of pollinators, describe what they looks like, and add any other interesting observations. Students can also draw or take photos of pollinators.
- Repeat the observations at students' second research site.
- Allow students time to summarize their observations.
- *What helped them make pollinator observations today? What should they do differently next time they observe?*
- If available, have student put garden signs with their name on it at their research site.

Digging Deeper

- Repeat the investigation one to two weeks later. Try to visit the garden at about the same time of day.
- Record the temperature as a class and point out where students will be recording their data today.
- Repeat the pollinator observations for the same amount of time as the first day. Remind students to observe the same locations as last time. Encourage students to note if anything about their site has changed.
- Repeat the investigation for a third time a week or two later.



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Add a monarch migration connection. Have students specifically record the number of monarch butterflies. Research monarch migration to discover why their numbers decline in the fall.

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Making Connections

- After the final day of data collection, each small group will work together to create a bar graph of the number of observed pollinators per day. Use different colors for the two observation sites and include graph labels.
- Have each group pair up with another to compare and contrast pollinator numbers. *Which location had the most pollinators? What day had the most pollinators?*
- Bring the class back together. *Why would pollinator levels be higher in some locations than others? (More flowers, less disturbances, etc.)*
- *Why would pollinator numbers decline or increase over time? What factors could have influenced this change? (Weather, temperature, migration, etc.)* Have student write down their answers.