



Pollinators

This month we are learning about our good garden friends the pollinators. Who are the pollinators? Bees, hummingbirds, moths, bats, butterflies, flies, and beetles are a few notable representatives. Pollinators are animals that help many flowering plants produce their seeds and thus ensure the continued existence of millions of plant species, and in turn, of most animal species, including humans. Each week we will dig into a different pollination-focused topic and provide instructions for engaging, hands-on lessons. By the end of the month we hope your young gardeners will understand the intricate relationship between pollinators and flowering plants and also learn to love, respect, and appreciate these hard-working animals.

Week 2: Who are the pollinators?

Learning Objectives

This week kids will:

- learn how to identify common pollinators
- discover why different pollinators are attracted to different kinds of flowers
- sharpen their observation skills

Materials Needed for the Week

Activity 1:

- [Pollinator/Flower Profile Cards](#)
- Crayons, colored pencils or markers

Activity 2:

- [Pollinator Scavenger Hunt Printout](#)
- Crayons, pencils, and pens
- Clipboard (optional)

Activity 3:

- Writing paper, journal, or [Pollinator Journal](#)
- Pencil or pen

- Field guides or access to digital identification tools
- Clipboard (optional)
- Camera (optional)

Introduction

Although bees are the best-known and most widespread pollinators, other kinds of animals, including wasps, beetles, flies, butterflies, moths, birds, and bats act as pollinators for various kinds of flowers. Over millions of years, many flowers and pollinators have adapted together and developed special relationships. For example, a pollinator may have an adaptation that allows it to detect the colors or scents of a certain flower, so it's able to recognize it as a valuable source of nectar and pollen. Another type of pollinator may have evolved special structures, such as an extra-long tongue, so it can reach the nectar deep inside a tubular bloom. These special adaptations give the pollinators advantages over their less fortunate kin, and they pass the adaptations on to their offspring. Over many generations these traits have become well established in pollinator populations. Meanwhile flowers have also evolved, giving rise to specific characteristics or adaptations that attract particular pollinators.

To compete for the attention of pollinators, flowers have come up with creative methods to entice creatures to their sugar-filled nectar and protein- and vitamin-rich pollen. In exchange, the unsuspecting creatures unintentionally act as messengers, delivering pollen between blooms that would otherwise never touch. The amazing diversity of flowers results from their unique adaptations to lure a range of pollinators (or to ensure that wind or, more rarely, water carries pollen). Every aspect of a flower, from the designs on its petals to the timing of its bloom, is vital to its pollination strategy. Below are examples of flower characteristics that attract some common pollinators:

Pollinator Flower Preferences

Pollinators	Flower Preferences
<p>Bees</p> <p>Did you know? There are about 4,000 species of native bees in the U.S. ranging in length from less than 1/8" to more than 1". Most of these bees are solitary nesters. Unlike the non-native (but now naturalized) hive-building honeybees, solitary native bees have no hive to defend and are unlikely to sting!</p>	<p>Yellow, blue, purple flowers. There are hundreds of types of bees that come in a variety of sizes and have a range of flower preferences. They can't see red, but are attracted to some red flowers, such as bee balm, that reflect ultraviolet light. Small bees, which have short tongues, prefer packed clusters of tiny flowers (e.g., salvia, alyssum, lilacs, phlox, butterfly weed, aromatic herbs). They like flowers with a good supply of nectar and pollen. They use the nectar to make honey, and they also store pollen in their honeycombs to use as an alternate food source.</p>

Butterflies	Red, orange, yellow, pink, blue flowers. They need to land before feeding, so prefer flat-topped flower clusters (e.g., Joe Pye weed, calendula, butterfly weed, yarrow, daisy, zinnia) in a sunny location. They like flowers with lots of nectar available. Just as important, butterflies also seek out specific plants on which to lay their eggs, so that when the eggs hatch the larvae (caterpillars) have a ready food source. Different butterfly species need different plants for their larvae, including milkweed, aster, lupine, thistle, fennel, violets, hollyhock, black-eyed Susan.
Moths	Light-colored and white flowers. Most moths are active at night, so they prefer plants that open at dusk such as evening primrose and moonflowers. They like flowers with lots of nectar available and tend to be attracted to flowers that give off a strong sweet scent.
Pollinating beetles	Dull white and green flowers. Since they do not all fly (or at least fly well), beetles prefer wide-open, bowl-shaped flowers that they can sit in, such as magnolia, aster, sunflower, and rose. They like flowers that have lots of pollen to eat. They may also eat the petals and other plant parts.
Flies	Green, white, or cream flowers. They have short tongues, so prefer simple, bowl shapes. Pollen is an important food source for them. They are attracted to flowers that give off foul odors, such as trillium and western skunk cabbage.
Hummingbirds	Red, orange, purple/red flowers. Their long beaks fit well into tubular flowers with lots of nectar. Nectar is their main food source and so they search out flowers with an ample supply (e.g., honeysuckle, sage, fuchsia, jewelweed, fireweed, cardinal flower, bee balm, nasturtium, century plant). No landing areas are needed since they hover while feeding.
Bats (Pollinating bats are found primarily in the Southwest)	White and light-colored flowers. Bats prefer large, night-blooming flowers with strong fruity odors (e.g., many types of cacti). They like flowers with lots of nectar available.

Activity 1: Pollinator/Flower Profile Cards

1. Read the Blooming Café reading page independently or together. Complete the reading comprehension questions and then talk about the special relationships between plants and pollinators and the characteristics of each that support the dependence on each other. You can use the introductory information for additional details to share.

2. Print out the Pollinator/Flower profile cards and play a matching game with your kids to talk about how different pollinators are attracted to different types of flowers. If you have a larger number of kids playing, you can give each child a flower or pollinator card and then give them time to find a partner with the matching pollinator or flower card. Make as many copies as you need so that each

child has their own card. Alternatively, if you are playing with just one or two kids, you can turn the cards over and play the game as a memory matching game.

Here are the answers to the pollinator-flower matches:

Magnolia – Beetle

Monarda – Hummingbird

Moonflower – Moth

Saguaro – Bat

Snapdragon – Bee

Trillium – Fly

Zinnia – Butterfly

3. As an optional extension to this activity, have the kids color the cards, keeping in mind the information in the introduction about the colors and patterns that each of the pollinators tends to be attracted to.

Activity 2: Pollinator Scavenger Hunt

1. Go on a pollinator scavenger hunt. Use the scavenger hunt worksheet or create your own to help you find pollinators in your garden or in a local green space. This activity is best done in the spring through the fall as it is hard to find flowers and pollinators during winter months.

2. A few optional adaptations to this activity:

- To add to the fun, you can turn it into a game to see who can find the most pollinators and pollinator-attracting flowers.
- Go on multiple pollinator hunts at different times of the day using a different worksheet each time, and then compare your results. Make sure to record the time of your observations at the top of your sheet before you start. Do you notice any differences in what pollinators you find or what flowers are open at different times of the day? You could also record temperature or weather conditions and look for patterns. Repeat more than once for best observations. You could also track over many months and look for seasonal differences. Graph your results to practice additional math and science skills.

Activity 3: Start a Pollinator Journal

1. Take your young explorer's observation skills to the next level by starting your own pollinator journal. You can create your own with notebook or even scrap paper stapled together, you can use a composition book, or you can also print out the KidsGardening Pollinator Journal included at the end of this lesson. Another option is to purchase a [Pollinator Field Guide](#) from Gardener's Supply Company if you would like a more defined resource to direct your child's observations.

2. To get started, set aside some chore-free time to **explore your garden or a nearby green space**. For maximum enjoyment, select days with comfortable weather and a relaxed schedule. As

with the scavenger hunt, you can also try visiting at different times of the day to see if time, temperature, and sunlight impact your garden visitors.

Before heading outside, **set the stage with a few ground rules and tips:**

- Respect all life in the garden.
- Observe living creatures with your eyes, not your hands.
- Write down or draw as many details as possible.

Younger observers may want to rely on drawings. For older children, encourage them to take written observations and more extensive notes. This activity can be a way to help sharpen their science and writing skills. If tools are available, you can also encourage them to take photos that they can later add to their journals and/or use to create a digital journal or collage.

3. Either while you are outside or when you return home, use resource materials to help you identify any pollinators you do not already know. There are a number of printed field guides that can be purchased or checked out from a local library. There is also a growing body of online identification guides available. Here are a few digital resources you may want to check out:

- Bee Identification Guides from the Pollinator Partnership: <https://www.pollinator.org/bee-guides>
- Seek by iNaturalist created by California Academy of Sciences and National Geographic: https://www.inaturalist.org/pages/seek_app
- Citizen Scientist Pollinator Monitoring Guide by The Xerces Society for Invertebrate Conservation at the University of California at Berkeley: https://xerces.org/sites/default/files/2018-05/11-010_01_XercesSoc_Citizen-Science-Monitoring-Guide_California_web.pdf

There are many, many more online resources available. Your state's land grant university's entomology department is often a great place to look for information about insects specific to your area. Make sure to match your identification activities to the interest and developmental level of your kids. For example, identifying a bee as a bee or a beetle as a beetle may be more than enough for younger children (and not require a field guide), but older students may want to take on the challenge of identifying the specific species of bee found.

4. Want to expand on this activity further? Encourage your kids to conduct a pollinator inventory to deepen their understanding about how many pollinators are out there at work. This can be as simple as keeping a tally in a chart in your journal of the different pollinators you see or as involved as participating in an organized wildlife inventory.

There are a number of organizations that offer regional and nationally planned inventories which are usually conducted to support conservation efforts and awareness. In addition to increasing their knowledge, participating in an organized inventory can be a fun way for kids to connect with others and feel like they are making a difference. Here are a few inventory opportunities you may want to explore (note that not all of these are specific to pollinators):

- iNaturalist from the California Academy of Sciences and National Geographic: <https://www.inaturalist.org/> (conduct a search of community projects to see if there are any in your area)
- Monarch Watch: <https://www.monarchwatch.org/>
- Earth Challenge 2020 from the Earth Day Network: <https://earthchallenge2020.earthday.org/>
- October Big Day (Bird count): <https://ebird.org/octoberbigday>
- The Great Backyard Bird Count (February): <http://gbbc.birdcount.org/>
- The Lost Ladybug Project: <http://www.lostladybug.org/>
- Journey North (monitors a variety of migratory animals): <https://journeynorth.org/>

Digging Deeper

You can use the following resources to dig deeper into this week's lessons:

Books

The Reason for a Flower by Ruth Heller

Beautiful illustrations and simple text providing an overview of the purpose of flowers in the plant world.

Bea's Bees by Katherine Pryor

Follow Bea as she learns what kind of flowers bees like and their other habitat needs.

The Flower Alphabet Book by Jerry Pallotta and Leslie Evans

This book shows the diversity of flowers found in all different colors, shapes and sizes.

Videos

Slo-Mo Footage of a Bumble Bee Dislodging Pollen from the Smithsonian Channel:

<https://www.youtube.com/watch?v=J7q9Kn1rhRc>

The Beauty of Pollination from Moving Art(TM):

<https://www.youtube.com/watch?v=MQiszdkOwuU&t>

Pollination: Trading for Food for Fertilization from Cornell University's Naturalist Outreach Series

<https://www.youtube.com/watch?v=Lu7AjOvznh8>

Additional Related KidsGardening Lessons and Activities to Try

Petal Attraction:

<https://kidsgardening.org/lesson-plans-petal-attraction/>

Wonderful Wildflowers:

<https://kidsgardening.org/lesson-plan-wonderful-wildflowers/>

Imperfect Flowers: A Design for Genetic Diversity
<https://kidsgardening.org/lesson-plan-imperfect-flowers/>

Insect Safari:
<https://kidsgardening.org/lesson-plans-insect-safari/>

Bug Hunt:
<https://kidsgardening.org/garden-activities-bug-hunt/>

Wildlife Inventory:
<https://kidsgardening.org/garden-activities-wildlife-inventory/>

Plant Families for Pollinators:
<https://kidsgardening.org/garden-how-to-plant-families-for-pollinators/>

Planting a Flower Clock:
<https://kidsgardening.org/garden-activities-planting-a-flower-clock/>

Flower Adaptations to Lure Pollinators:
<https://kidsgardening.org/garden-how-to-flower-adaptations/>