About This Module

Overview	Embark on an incredible journey with your youth to explore pollination and the pollinators that play a critical role. This week-long investigation is packed with daily activities and can be used as a kick-off module to build a pollinator garden at your Club. Be sure to check out the accompanying Pollinator Garden Planning Guide if you and your youth are interested in starting a garden!
Guiding Questions*	• What is pollination? • What is a pollinator? • Why are pollinators important? • How can I help protect pollinators in the wild?
Session 1	**Plant Power** Youth learn about plants and their parts by participating in a flower dissection.
Session 2	**Explore Your Ecosystem** Youth explore wild pollinators by participating in a nature walk and completing a scientific sketching activity.
Session 3	**It's Electric!** Youth discuss pollination and static electricity. Then they will participate in three experiments to discover the link between pollination and static electricity.
Session 4	**The Value of Pollinators** Youth review what they learned about pollination. Then they play a group game to understand how the decline of pollinators impacts an ecosystem.
Session 5	**Protect Our Pollinators** Youth discover the importance of doing their part to ensure healthy and stable environments. Participants will create seed tossers to plant wildflowers that attract pollinators.

*Guiding questions are not specifically asked in the sessions themselves but are meant to guide your preparation and facilitation of the module. Keep these questions top of mind so you can help youth make connections and capture key takeaways relating to the topic.

Key Terms

Word	Definition
Photosynthesis	The process plants use to create their own energy, or food.
Pollen	Small, dust-like grains produced by the male reproductive part of the plant that are needed to create seeds.
Leaf	Part of the plant that is typically green and makes food (energy) for the plant.
Pistil	Female reproductive part of the plant that collects pollen to create seeds.
Stamen	Male reproductive part of the plant that has pollen on it.
Stem	Long, thin part of the plant that moves water and nutrients through the plant.
Petal	Modified, often colorful, leaves that make up most of the flower and attracts pollinators.
Sepal	Modified leaves that protect immature flowers and support petals.
Pollinator	Something that moves pollen from one flower to another.
Pollination	The process of spreading pollen from the male part of a plant to the female part to create a seed.
Ecosystem	An area where living and non-living things work together and interact.
Static electricity	Buildup of electrons, or negatively charged particles.
Extinct	An organism that is longer existing or living.

Supplies

Facilitator Needs	1	Computer with internet access (optional)
	1	Projector (optional)
	1	Whiteboard and markers (optional)
	1	Flipchart paper and markers
	1 roll	Wall-safe tape
	1	Stopwatch or timer
	1	Tablet or phone with internet connection (optional)
	1	Dish
	1	Bowl
	1	Shaker of salt
	1	Shaker of pepper
	1	Spoon
	1	Pitcher
	1 bottle	Bubble solution (or dish soap mixed with water)
	1	Flat piece of glass or plastic
	6	Paper cups
	1+ roll	Paper towels
	5 sets	Jenga blocks
	5 pairs	Scissors
	5	Spray bottles
Each Pair Needs	3+	Colored pencils
	1	Flower *Note: While you can use any flowering plant, those such as tulips, daffodils and lilies are best because their parts are more distinct.*
	1	Child-safe cutting tool such as scissors, scalpel or plastic knife
	1	Magnifying glass (optional)
	1	Cutting board (optional)
	1	Pencil

Supplies, cont.

Each Participant Needs	1	Mask, gloves and goggles (for youth who are allergic to flowers)
	1 pair	Noise-cancelling headphones (for youth with sound sensitivities, optional)
	1	Pencil
	1	Clipboard, or something for youth to press down on while sketching
	1	Binoculars (optional)
	1	Magnifying glass (optional)
	1	Balloon
	1	Drinking straw
	1	Natural clay (small lump)
	3-5	Native wildflower seeds
	2 Tbsp.	Potting soil
	1	Paper lunch bag (optional)

Background Information

What is a plant?

Plants are critical to the stability of Earth's ecosystems, and thus, our survival. Plants are living organisms that are made of many cells, reproduce and require energy to survive. Most are flowering, seed-producing plants called angiosperms.

Seeds are produced through the fertilization process known as pollination. Pollen – small dust-like grains that develop sperm cells – is created in the male reproductive system called the stamen. Eggs develop in the ovary, which extends from the pistil. Once sperm cells combine with an egg, a seed is created. If a seed can obtain water, a good temperature and a stable habitat, it may germinate or grow into a mature plant. A seed will begin to develop roots, stems, leaves and flowers – all the parts needed to produce its own food and thrive in its habitat.

What is a pollinator?

More than 70% of Earth's flowering plants rely on animal pollinators, such as bees, butterflies and hummingbirds. A pollinator transfers pollen from one plant to another. Many pollinators are attracted to flowering plants and use them as sources of food. When a pollinator encounters pollen, these dust-like grains cover the animal and is then transferred to other plants as the pollinator travels.

What is the relationship between pollinators and people?

It is estimated that over 30% of the food we eat – or one out of every three bites of food – is the result of pollination. According to the USDA, crops dependent on pollination are worth billions of dollars annually. If you're interested in learning about what type of foods you enjoy that require pollination, check out this list of **Pollinated Foods** (pollinator.org/pollinated-food).

Our current food production system is intricately linked to pollinators and the pollination process. Sadly, many of Earth's pollinators are impacted by changing environments. It is vital that we work to stabilize and maintain our ecosystems to save the species that pollinate crops, providing the basic needs for the human population.

How can I help pollinators and protect wildlife?

One way we can help pollinators is to learn and share information about them. Research the plants and pollinators native to your region. Go outside to make observations, and share this information with others.

Another way we can all help pollinators is to grow and cultivate gardens with native plants. These gardens – big or small – attract local pollinators that use plants as food and shelter sources. While starting a garden can be extremely rewarding, it does take some planning. See the Pollinator Garden Planning Guide – under the Resources tab of this collection – to get started.

Resources

For more information on gardening, or to connect with gardening professionals, please visit:

- **Kids Gardening** (kidsgardening.org)
- **Ecoregional Planting Guides** (pollinator.org/guides)
- **Extension Offices** (NIFA.USDA.gov/land-grant-colleges-and-universities-partner-website-directory?state=533)
- **Master Gardeners – American Horticultural Society** (ahsgardening.org/gardening-resources/master-gardeners/?state=la)
- **Video: "Why You Should Start a Pollinator Garden – Cincinnati Zoo"** (video on Bing.com)

For information on how to plant and maintain your garden, please visit these videos on **Bing.com:**

- **Video: "How to Maintain Pollinator Garden – Cincinnati Zoo"**
- **Video: "How to Plant Flowers | Lawn & Garden Care"**
- **Video: "How to Plant a Container Garden"**
- **Video: "Gardening From Seeds: How to Plant Seeds in a Container"**

For more information on pollinators, please visit:

- **Pollinator Conservation Resource Center – Xerces Society** (xerces.org/pollinator-resource-center)
- **U.S. Fish & Wildlife Service** (FWS.gov/initiative/pollinators)
- **Pollinator.org**
- **USDA** (USDA.gov/pollinators)
- **U.S. National Park Service** (nps.gov/sacn/learn/nature/pollinators.htm)

Academic Skills

- Analyzing and Interpreting Information
- Asking Questions
- Planning and Carrying Out Investigations
- Creativity

Social-Emotional Skills

- Communication
- Teamwork
- Ethical Responsibility

Extension Activities

- Check out the Pollinator Garden Planning Guide – under the Resources tab of this collection – and start a pollinator garden at your Club.
- Encourage youth to become an **X Kid** (xerces.org/xkids): Complete the activity guide from the Xerces Society of Invertebrate Conservation.
- Research foods that rely on pollinators and host a pollination-themed lunch or snack.

Career Connections

In this module, youth learn about pollinators, plants and protecting the natural world. Below are a few careers that align with the covered topics. Click the links to learn more about these careers.

- **Botanist** (environmentalscience.org/career/botanist)
- **Ecologist** (environmentalscience.org/career/ecologist)
- **Entomologist** (environmentalscience.org/career/entomologist)
- **Beekeeper** (environmentalscience.org/career/beekeeper)
- **Horticulturalist** (environmentalscience.org/career/horticulturalist)

Family and Caregiver Engagement

On-Site:

- Ask for family and caregiver volunteers to help start and maintain a garden.
- Help youth create pollinator art, and host an art show for family and friends.

At Home:

- Encourage families to participate in a **Community Science Program** (from xerces.org/community-science) that supports the health and stability of pollinators.
- Encourage families to go on nature walks to discover native plants and animals in their backyard.

Note to Facilitators: *Sessions 2 and 5 include outside activities. Check the weather and schedule the sessions for a sunny day, if possible.*