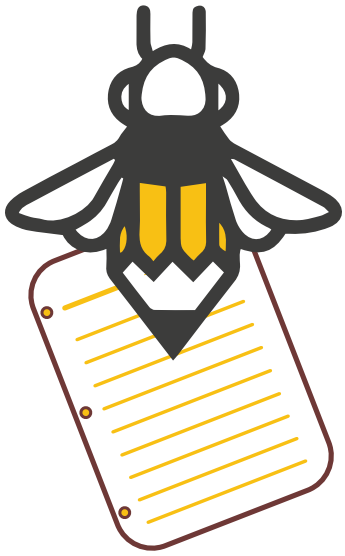


# MY POLLINATOR JOURNAL

Name_____

Produced by
The Bee Cause Project

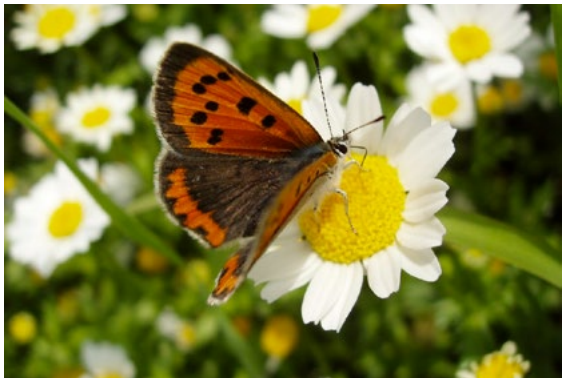
# FLOWERS + POLLINATORS

Flowers and pollinators are dependent upon one another for survival. They give and take life-sustaining elements to make more of their own species. Bees, butterflies, hummingbirds, bats, wasps, beetles, and flies are all pollinators that help flowers by moving pollen from flower to flower. And these pollinators get something delicious in return for their hard work. Read on to discover more about pollination!

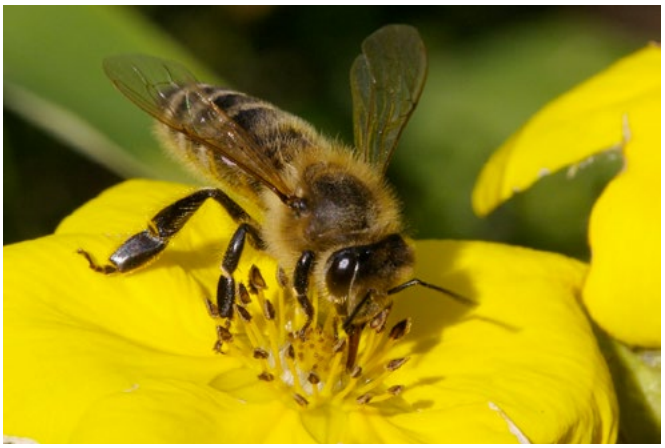
Flowers need pollen from flowers of the same species to make seeds. When a flower gets the pollen it needs to complete reproduction, it is called **pollination**. Seeds grow new plants that produce more flowers but flowers cannot walk around the garden to get what they need. A pollinator must carry the pollen from one flower to another. Flowers have lots of ways to attract different types of pollinators to get the job done. It is a perfect system of exchanging food for fertilization. Generations of pollinators help our planet reproduce flowers AND provide approximately one-third of the foods that we eat!

"Heart of a prickly pear cactus flower, with bee" by Martin LaBar

Flowers use color, smell, and shape to attract pollinators. Bright colors and strong smells tell the animals, "I'm over here!" Moths and bats are attracted to white, strongly scented flowers because they are easier to find for these night hunters. Beetles cannot smell or see very well so they are also attracted to light colors like white or green. Beetles and butterflies are attracted to large, dish-shaped flowers because they need a steady platform to land on. Butterflies are attracted to many different colors while bees are attracted to yellow, blue, and purple flowers. Many pollinators cannot see red flowers, but hummingbirds love the color red. Also, flies love plants that smell bad, like rotting meat or poop! These flowers tend to be brown, purple, or green.

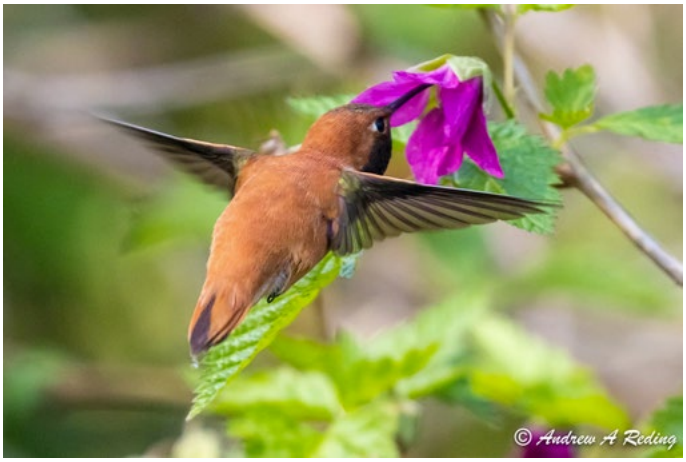


Flowers also produce pollen and nectar to attract pollinators. Bumblebees, honey bees, hoverflies, and beetles eat pollen as part of their daily diet. Honey bees take pollen back to the hive to make 'beebread;' an energy-packed food source for babies and adult bees. Honey bees can pack pollen onto their corbicula or "pollen baskets" on their back legs for the flight home. Beetles feed on flower parts and petals as they accidentally gather pollen on their legs and body while other pollinators eat the pollen right from the source as they flit around the garden.



"Honey bee" by Mamboman1

Many pollinators visit flowers to eat nectar; a sweet, sugary fuel source that is a very important part of their diets. Because each type of pollinator drinks nectar in a different way, they all have special mouthparts for their drinking style. Butterflies and moths sip nectar using a long tongue that looks like a straw called a proboscis. Hummingbirds have a long beak and an even longer tongue to reach the nectar in tube-shaped flowers. Bees have a shorter straw-like mouthpart that they use to drink nectar. Honey bees can even store extra nectar in a honey sac that is separate from their stomachs. This is how they transport nectar back to the hive to make honey.




"rufous hummingbird drinking nectar from salmonberry blossom" by Andrew Reding

Different types of pollinators move pollen in different ways. As the hummingbird sips nectar using her long tongue, she gathers pollen on her head. When she visits the next flower, she deposits the pollen in the same way. Bats collect and pass pollen on their furry faces while they are eating nectar and other flower parts. Bees, flies, butterflies, moths, and beetles all move pollen with their legs. Bees move a great deal of pollen because their legs are very hairy!

Some pollinators like butterflies also need plants for their babies to eat as soon as they hatch from eggs. An adult butterfly will find a plant such as parsley, milkweed, dill, or basil to lay its eggs. When the caterpillar (or **larva**) emerges from the egg, it will eat the host plant to get the nutrients it needs to grow. Once the caterpillar is ready, it will build a chrysalis and begin the process of metamorphosis into a butterfly. Plants provide a wealth of resources to pollinators.

"Monarch Chrysalis on Zinnia" by U.S. Fish and Wildlife Service - Midwest Region

**To learn more about pollinators and flowers, scan this QR code!**

Flower Talk

Get up close and personal with pollen at Museum of the Earth!
https://www.museumoftheearth.org/bees/eat-pollination

Watch Flowers and Their Pollinators: A Perfect Match for more information about how pollinators sip that sweet nectar!
https://www.youtube.com/watch?v=pnBoM4idf1k&t=74s

# POLLINATORS + FLOWERS: WHAT'S THE BUZZ?

Grab your pencil and clipboard and find an area with flowering plants. Sit as still as you can! Put one tickmark for every pollinator you see and the flower color they were visiting. Answer the follow-up questions and compare your observations with your class.

| | Red | Orange | Yellow | Green | Blue | Purple | White | Pink |
|---|---|---|---|---|---|---|---|---|
| **Bee** | | | | | | | | |
| **Beetle** | | | | | | | | |
| **Butterfly** | | | | | | | | |
| **Fly** | | | | | | | | |
| **Hummingbird** | | | | | | | | |
| **Moth** | | | | | | | | |

**1.** Which pollinator did you see the most? The least?

_____

**2.** What color flower attracted the most pollinators?

_____

**3.** Did you see the same pollinator visit different color flowers? Which ones?

_____

**4.** Compare your observations with your classmates! You can graph your results.

# SEED BALLS

## Materials:

- Organic Fiber Soil Disk or Potting Soil
- Powdered Red Clay for Seed balls
- Wildflower Seeds Mix or Host Plant Seeds
- Large Bowl
- Bucket
- Water
- Lifecycle of a Plant PDF - https://cf.ltkcdn.net/garden/files/3109-flowering-plant-life-cycle.pdf

## Steps:

**1.** Take a few minutes to explore the lifecycle of a plant using the PDF link provided.

**2.** Tell the students, "You will be making seed balls today and with the right conditions they will create a beautiful pollinator garden full of flowers." This is a great outdoor project!

**3.** Place the Organic Fiber Soil Disk in the Large Bowl and add two cups of warm water. It will take about 15 minutes for the disk to soak up the water and get fluffy. You can stir with your hands to ensure it is combined.

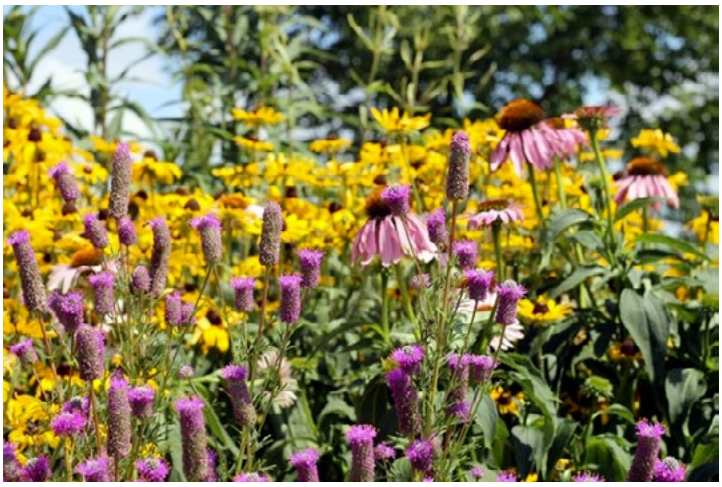
**4.** Pour the contents of the Powdered Red Clay into the bucket. Add the Organic Fiber Soil so that you have one part clay to one part soil. **NOTE: This part is best done outdoors, the clay is a very fine powder and can make a mess. Be careful not to get into your eyes!**

**5.** Mix in your packet of seeds using your hands.

**6.** Roll mixture into 1 inch balls, about the size of a quarter, and allow to dry for at least 24 hours.

**7.** Take a walk with students and throw seed balls in areas that would be good for flowers to grow. This should be in a place where the seed ball will be able to touch the exposed ground, where water and sunlight can reach, and out of the way of foot traffic.

**8.** Students should take at least one seed ball home to toss in an area of their own backyard or in a community space.



"Pollinator Garden" by U.S. Fish and Wildlife Service - Midwest Region

**It is important to know the variety of seeds that will grow in your area. We recommend a quality seed company like Botanical Interests or Ernst Conservaiton Seeds for you seed supplies.**

**For more lessons like this one, scan this QR Code!**

6 Week Bee Unit

**Look Inside a Flower with this video from Science Projects for Kids!**
https://www.youtube.com/watch?v=R9sn7HZM7uY

# SEED BALLS: WHAT ARE YOU GROWING?

Now that you have made your seed balls, it is time to learn more about the type of flowers you will be growing for pollinators. Use the label from the seed pack to draw one of the types of flowers you will grow and answer the questions below. If you need help, use Kiddle.co to research your flower type.

What color is the flower?_____

Does your flower have a strong smell? _____

Does your flower have small petals, large petals or both? _____

What pollinators do you think will visit your flower? _____

What information do you know that helps you understand which type of pollinator would be attracted to this flower?

_____

_____

# SOWING WILDFLOWER SEEDS

Seed balls are one way that you can support the pollinators in your community. You can also use packets of wildflower seeds to create a pollinator habitat just as easily. Pollinator Gardens work in containers or raised beds as easily as in a pre-existing flower bed. Here are some suggestions for creating a Pollinator Garden at your school!

1. **When to Sow Seeds** - Your seed packet will provide information about when to plant based on the last frost of the season. Be sure to follow the instructions for the best results.

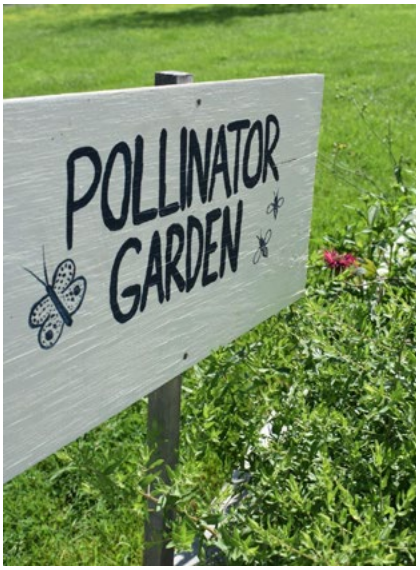
2. **Preparing the Soil** - Choose an area that allows for at least 6 hours of sunlight. Remove any weeds or debris from the area. Seeds need exposed dirt to begin the germination process. Better preparation of the soil = more flowers!

3. **Sowing the Seeds** - The seed packet will provide information about spacing for the seeds. Many species of wildflowers do not like to be crowded so follow the coverage rate per square foot. You can also mix your seeds with sand to make spreading easier.

4. **Pressing the Seeds** - Seeds need sunlight to germinate! Burying them too deep will result in no growth. Press the seeds into the topsoil by stepping on them or pressing them with your hand.

5. **Watering the Seeds** - Water in the seeds well and continue to water every few days. Depending on the time of year you are planting, you may not need to continue to water. For example, if you plant the seeds during a rainy season, that will be sufficient to aid in germination and growth.

6. **Alerting your Community** - It is important that your Pollinator Garden have the opportunity to flourish year after year. Consider creating or purchasing signs to keep foot traffic out of the garden.




**Learn more about Pollinator Gardens by visiting these websites!**

**Fall Is For Planting Wildflower Seeds**
https://www.americanmeadows.com/fall-planting-wildflower-seeds

**How to Plant and Maintain a Wildflower**
https://www.gardeners.com/how-to/growing-wildflowers/5023.html?gclid=CjwKCAiAl-6PBhBCEiwAc2GOVKrFiLHROm_Ng2zp4bnOQQP56KLsPzgbQinmsD7ApgCrgJethivdexoCo_8QAvD_BwE

**Easy Steps to Plant a Pollinator Garden from Seeds for Bees, Butterflies, and Hummingbirds**
https://www.youtube.com/watch?v=mIJ4feqW9R4

# HOW YOU CAN HELP THE POLLINATORS

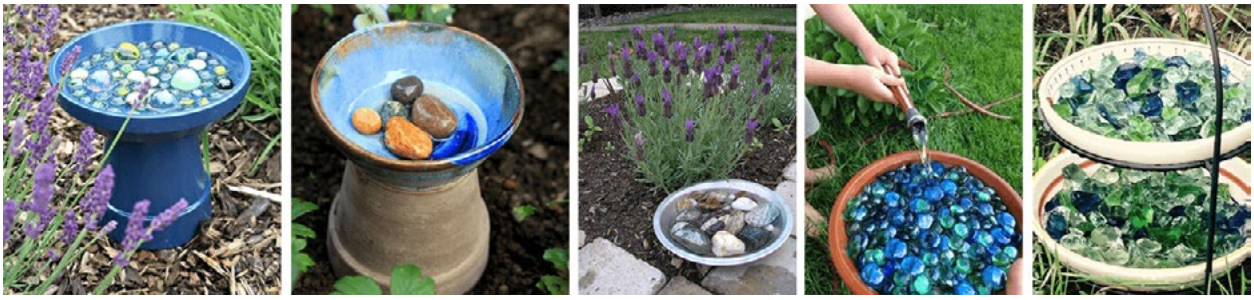
Pollinators need our help! We rely on pollinators to pollinate the flowers that grow into our fruits and vegetables. Thanks to pollinators, about one out of every three bites of food on our plates comes from their hard work. They also pollinate the types of plants that we use to make fabric for our clothes and the crops that animals need to survive. But pollinators are in trouble. There are many factors that make it hard for these animals to survive including loss of habitat and loss of food sources.

There are many ways that we can all help pollinators in our communities. Seed balls are one way that you can provide resources for pollinators. Here are some other suggestions, both large and small, for you to try at school and at home.

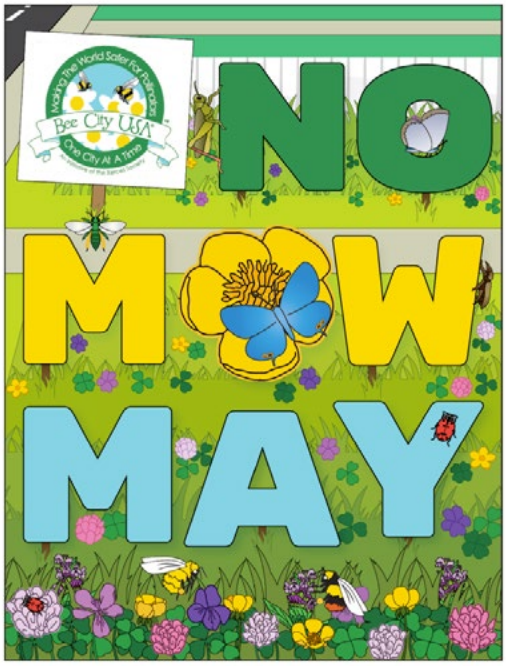
- **Grow a Pollinator Garden with loads of flowers!** Many pollinators like bees visit the same type of flower when they forage for food. Plant flowers in clumps to attract bees. And don't forget to add host plants like dill, fennel, parsley, and chives.

"Wild Honey Bees" by bob in swamp

- **Create a Bee Bath!** Use a shallow dish or birdbath and add water. Place small rocks into the dish so that your pollinators, including bees, have a place to land. They cannot swim so they need a safe place to drink. Add fresh water daily!
    - We recommend Haxnick's 6" Bamboo and Rice Compostable Saucer and Rocks for Succulent Plants



- **Create a No Mow Area!** Allow an area of your yard or school campus to grow naturally, especially during the dandelion and clover season. Weeds are a great first source of nectar for pollinators in the spring. Visit beecityusa.org for your free **No Mow May Signs.**




**Scan this QR code to learn more about how you can Bee A Friend to Pollinators on your school campus or in your own yard!**

Bee A Friend...

# NATIVE BEE HOUSE

Did you know that there are 4,000 native bee species in the United States? The largest native bee, the carpenter bee, is about one inch in length and the smallest, the Perdita Minima, measures only 2 millimeters! Native bees are solitary, which means that they do their work alone. These bees feast on the nectar and pollen of native plants that they evolved alongside for millions of years.

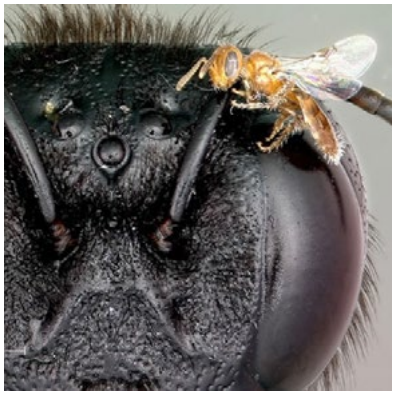


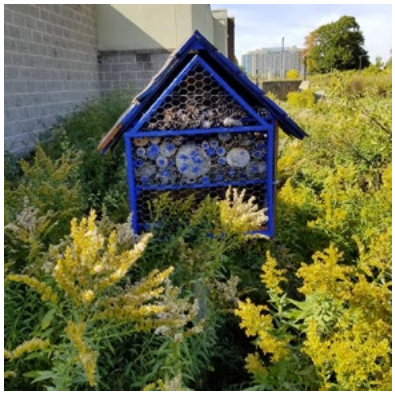
Photo by Stephen Buchmann

All female native bees are queen bees that build a nest for laying their eggs. Native bees are known for their unique nesting styles. Some choose to nest underground like Sweat Bees, Bumblebees, Mining Bees, and Long-Horned Bees. Others are cavity-nesters, like Mason Bees, Carpenter Bees, and Leafcutter Bees who seek out twigs, stems, and even crevices between rocks for their nests.

Native bees do not swarm, they rarely sting, and they do not produce honey or wax. Adding a native bee house to your school or home provides a safe habitat where you can peacefully observe their cosmic work. Studies have shown that adding nesting areas to your yard can have a real impact on the diversity and abundance of wild bees in your area.

Photo by maxful

There are many different types of native bee houses or bee hotels. Whether you purchase one or build your own there are some general rules to follow. When choosing a place to hang your bee house, keep in mind that the bees like for the house to be securely affixed rather than swinging. Attaching it to a fence, side of the building, or tree will keep the house from rocking in the wind. Native bees also like to be out of the rain so think about placing it under the edge of an existing roof or under the canopy of a tree. The bees prefer for their house to be at least six feet off the ground and have south or southeast sun exposure.



"Bee hotel in a refuge pollinator garden" by U.S. Fish and Wildlife Service - Midwest Region

Many varieties of native bees use mud or leaves to build their nests inside the tubes and tunnels of a bee house. This means that you should also consider placing your bee house near shrubs, trees, or even an open mud source. And, of course, all pollinators want to be close to flowers so they can fuel up while preparing their nest.

Your bee house is designed to sustain up to two years of healthy life cycles. At the end of that time, you should consider a maintenance plan to ensure that you are hosting healthy, happy bees. This process can take 30 minutes–just a few hours total each year for the benefit of bees.

**Check out the following sites to learn more about Mason Bee House Maintenance.**

**How to Care for Mason Bees Year-Round**
https://davidsuzuki.org/queen-of-green/how-to-care-mason-bees-year-round/

**How To Clean A Mason Bee House**
https://beekeepclub.com/how-to-clean-a-mason-bee-house/

**You can build your own Native Bee House!**
**Learn more from our friends at the University of Georgia.**
https://extension.uga.edu/publications/detail.html?number=C1125&title=Creating%20Pollinator%20Nesting%20Boxes%20to%20Help%20Native%20Bees

# NATIVE BEE HOUSE OBSERVATION LOG

Now that you have placed your native bee house in a good spot, it is time to observe who is visiting. Use these pages to make notes to share with your class or family about what you see. Check on your bee house at least once a month throughout the year to see how they behave differently from month to month.

Date: _____ Time of Day:_____

Weather: _____

Observations:

_____

_____

_____

_____

# NATIVE BEE HOUSE OBSERVATION LOG

Date: _____ Time of Day:_____

Weather: _____

Observations:

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# NATIVE BEE HOUSE OBSERVATION LOG

Date: _____ Time of Day:_____

Weather: _____

Observations:

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