

Bee The Change Library Program

Instructional and Educational Materials for the Bee The Change Kits



MISSION & IMPACT

The Bee Cause Project believes that you can #BeeTheChange! Bees need your help. Honey bees and native bees are perfectly adapted to pollinate the flowering plants in their environments. The vast majority of plants we need for food rely on pollination, especially by bees: from almonds and vanilla to apples and squash. Honey bees, wild and domestic, also pollinate around 80% of wildflowers worldwide.

But bees are in trouble. There is a decline in bees across the world caused by a combination of stressors - from loss of habitat and food sources to exposure to pesticides and the effects of climate breakdown. More than ever, we need to recognize the importance of bees and work to ensure their protection.

The Bee Cause Project seeks to inspire the next generation of environmental stewards while protecting the planet's precious pollinators. Through observational hives in schools and nonprofits, STEAM curriculum, and beekeeping resources, they hope to strengthen the connection to the shared environment with pollinators that enables both bees and curious minds to thrive. The ***Bee the Change Kit*** is meant to serve as a conversation starter to help adults and children learn the importance of pollinators in the environment while experiencing the wonder of the honey bee. The recipient of the kit will also be presented with an official Adopt a Bee Certificate!

Included in the ***Bee The Change Kit***:

- DIY Sustainable Native Bee House (1)
- Planting a Wildflower Bee Garden from Seed (1)
- Save the Bees Bracelet (1)
- Honey Tasting Experience (1)
- Adopt a Bee Certificate (1)

The Nature-Watch science/craft kits were designed to be used under adult supervision only. The Bee Cause Project recommends an adult assist all children under the age of 7 years old.

WARNING: CHOKING HAZARD-Small parts. Not for children under 3 years.

ACTIVITY 1

DIY SUSTAINABLE NATIVE BEE HOUSE TO ADD TO YOUR BACKYARD!



MATERIALS PROVIDED IN KIT

- Clear plastic tube (made from recycled water bottles!)
- Straws
- 2 Rubber Bands
- Twine

MATERIALS YOU WILL ALSO NEED:

- White Glue
- Scissors
- Markers or colored pencils

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 two 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 have evolved beside for millions of years.

All female native bees are queen bees who build a nest for laying their eggs. Native bees are known for their unique nesting styles. Some choose to nest underground like Sweat Bees, Bumble Bees, 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.

Mason bees do not swarm, rarely sting, and do not produce honey or wax. This activity is the perfect way to host these valuable bees in your own backyard where you can peacefully observe their cosmic work. Since all they need is a safe place to live, we can build homes for Mason bees and help their population grow. Studies have shown that adding nesting areas to your yard can have a real impact on the diversity and abundance of wild bees!

STEPS:

1. Wrap two rubber bands around the clear plastic tube about two inches apart. Loop the twine through the rubber bands and tie the two ends together. Leave enough space at the top of the twine to create a hanger
2. Use the scissors and cut all of the paper straws in half, this does not have to be exact. You can decorate the straws, be sure **not to** collapse them when pressing down! Add native bee facts, pictures, or leave them natural.
3. Lay the clear plastic tube on its side and spread a generous amount of white glue in the bottom of the tube. You can use one of the straws to spread the glue around.

4. Begin laying the straws into the bottom of the clear plastic tube. Add a small dab of more glue on the sides of the straws as you layer them on top of one another. It may get snug as you add your straws but keep moving them until they all find their place. Allow the glue to dry completely with the clear tube sitting upright.
5. Hang your Native Bee House at least 3 feet off of the ground, facing south or southeast, and in a sunny spot. Bees need water! If you can provide a water source like a shallow dish with pebbles for the bees to land on, you will attract even more wild bees to their new home!

Note: if you plan to give this native bee house to a friend, please include the small instructions sheet on where and how to hang it. Place the sheet under the rubber bands to hold it in place.



Image provided by Nature-Watch.com

Your native bee house is good for one year. Learn more about [How to Care for your Native Bee House.](#)

CONVERSATION STARTERS FOR ADULT AND CHILD PARTICIPANTS

- Why do you think that native bees are so important to the planet?
- How many bees do you think will use this bee house?
- Did you know that scientists use technology to monitor bees in their hives? Read more on [this website.](#)
- What other kinds of changes do you think we can make to help the native bees?
- Do you think there is a way that we can speak for the bees and share what we have learned with others?
- After observing the native bees coming and going, what kind of native bee house could you design that might allow for more bees to nest? Design and draw your own bee house!
- Learn more about the [Carpenter Bee](#) and [Perdita Minima!](#)



Photo by Stephen Buchmann

ACTIVITY 2**PLANT A
WILDFLOWER
BEE GARDEN
FROM SEED****MATERIALS PROVIDED
IN KIT**

- Clear plastic base and lid (made from recycled water bottles!)
- 4 soil pellets
- 1 spoon straw
- 1 packet of wildflower seeds

**MATERIALS YOU WILL
ALSO NEED:**

- Basin of water

Managed and wild bees rely on wildflowers, native flowering trees, and shrubs, as well as clover, henbit, and dandelions for the nectar and pollen they need to survive. Bees will fly about three miles away from their hive or nest to find energy-providing resources they require. They use the nectar and pollen to feed their babies too. The flower provides the resources, and the pollinators move pollen for the flowers. It is a perfect system of exchanging food for fertilization! Generation after generation of pollinators has helped our planet reproduce flowers AND provide approximately one-third of the foods that we eat!

And we can help the bees by planting wildflowers in our own communities. Bees need food during all seasons. The **Plant a Wildflower Bee Garden from Seed** Activity is a great way to learn how to get started planting for the pollinators. Take the time to learn what the bees like and create even more food for the bees!

STEPS:

1. Place soil pellets in your basin of water so that they can absorb some of the water. They will take about 4-5 minutes to plump.
2. After the pellets have absorbed the water, place them into the four corners of the plastic base. They will fit snugly.

NOTE – Be sure that you place the pellet with the **open end facing up**, you will be able to tell that it is the open end because the netting covers the bottom of the pellet and the top is open.

3. Using the end of the spoon straw (not the part that looks like a shovel), open the hole at the top of each of the pellets by pushing the straw about halfway down. You do not want to go too deep or the seeds will not sprout.
4. Using the shovel-shaped end of the straw, scoop up 10-12 seeds and place them down in the hole you just made in the top of the pellet. You have more than enough seeds so do not be overly concerned about how many you use. Use the shovel-shaped end of the straw to pull the loose soil back over the top of each pellet. Repeat this process for each pellet.

5. Once you have planted your seeds, pour about $\frac{1}{4}$ of an inch of water into the base. Pour the water between the pellets so that you do not disturb your seeds. The soil will absorb the water slowly as the seeds germinate.
6. Snap the lid carefully onto the base and place your greenhouse in a warm, sunny window. The greenhouse you have created will help your seeds get enough water, warmth, and sun to begin the process of sprouting within 2-3 weeks.
7. When you are ready to repot or plant your garden, first water the seedlings. Then carefully remove them from the container and place them into the soil, there is no need to remove the netting. You can choose to put your plants in a pot or directly into the ground. Be sure to choose a sunny spot and give them water as they continue to grow and flower for the bees! Just imagine if everyone planted a little bee garden!



Image provided by Nature-Watch.com

CONVERSATION STARTERS FOR ADULT AND CHILD PARTICIPANTS

- What are the benefits of planting a bee garden?
- All living things need food, water, air, sunlight, and shelter to survive. What have we already provided for the bees? What else do you think we could do to help provide for the bees and other pollinators?
- Learn more about the parts of the flower, watch [Parts of a Flower and Pollination](#).
- Enjoy exploring [Flowers and Their Pollinators: A Perfect Match](#) with this video.
- Take a picture of your greenhouse of seeds daily to see how the seeds grow. It is amazing to look back from start to finish to see your progress! You can create your own How-To Video for this project and share it with friends and family!
- Want to take your Bee Garden to the next level? Learn how to make a [Bee Cafe with Maddie](#) using the wildflowers you grew from seed!
- If you want to create an entire pollinator-friendly landscape, check out this [Ecoregional Planting Guide](#) to learn what the pollinators need in your neck of the woods!

ACTIVITY 3

WEAR A SAVE THE BEES BRACELET



MATERIALS PROVIDED IN KIT

- Letter Beads (SAVE THE BEES)
- 10 Yellow Beads
- Bracelet Wire
- Bracelet Clasps

DISCOVER EVEN MORE FACTS ABOUT BEES AT THE FOLLOWING WEBSITES:

- TheBeeConservancy.org
- fws.gov/pollinators
- beegirl.org/kidsandbees
- actforbees.org/resources/education
- preservationofhoneybees.org/kids-and-bees
- thebeecause.org

You can be the voice and speak for the bees! When you wear the **Save the Bees Bracelet**, you are telling your friends and family that you care about the ever-important

and majestic bee. Use your voice to tell others some of the amazing things that you have learned about honey bees, native bees, and other pollinators.

CHECK OUT THESE AMAZING BEE FACTS THAT YOU CAN SHARE:

- Honey bees have been around for about 30 million years!
- Honey bees can stroke their wings over 200 times per second!
- Bumble bees prefer to pollinate on cool, cloudy days when all of the other pollinators are at home!
- Sweat bees are attracted to the salt in your sweat, which is how they got their name!
- Mason bees collect mud to line their nests!
- Leafcutter bees cut circles out of leaves with their mouthparts, roll the leaves up like a cigar, and stuff them into hollow stalks and twigs to make their nests!
- Squash bees collect nectar and pollen from squash and pumpkin plants!
- Carpenter bees fly erratically like a hummingbird! They can also hover like a hummingbird!
- A queen honey bee can lay about 2,000 eggs per day!
- One ounce of honey can fuel a honey bee's journey once around the world!
- Bees are vegetarians! They only eat things that come from plants!!

STEPS:

1. Find a place to safely unpack and organize your beads, a small towel would be helpful to keep the beads from rolling around.
2. Keep the two clasp pieces closed together. Thread the end of the wire through one end of the bracelet clasp. Tightly twist one end of the clasps onto the wire about $\frac{1}{2}$ from the end.

NOTE – Consider the age of the child you are working with. Older children will be able to put the beads in order easily following the next step. It will help younger children to put the beads in order on their towel before stringing begins. And for children with smaller wrists, use less of the yellow beads so that the bracelet will fit when completed.

3. String 3 or 4 yellow beads followed by the word “SAVE”, then 1 yellow bead followed by the word “THE”, then 1 yellow bead followed by the word “BEES”, then 3 or 4 yellow beads.
4. Measure the bracelet on your wrist. Loop the free end of the wire through the open loop of the clasp and twist it until it is tight. Cut any excess wire off of the bracelet.



Image provided by Nature-Watch.com

CONVERSATION STARTERS FOR ADULT AND CHILD PARTICIPANTS

- What would you want to tell someone about bees?
- Create a presentation, either using markers and poster board, or a digital platform to share with friends, family, at school, or an organization you belong to.
- Do you know about the lifecycle of the bee? Go to BuzzAboutBees.net to learn more about the Lifecycle of the Bee. Draw your own lifecycle of a bee in the style of a comic book. Add talking bubbles to explain what is happening at each stage using the voice of the bee.
- Have you ever wondered what it is like to live in a honey bee hive? Watch this [Live Honey Bee Landing Zone](#).
- This [High Speed Summary of Life Inside the Beehive](#) gives you a closer look at how honey bees build their honeycombs.

ACTIVITY 4

HONEY TASTING EXPERIENCE



MATERIALS PROVIDED IN KIT

- 4 honey straws (labeled A, B, C, D)
- Food Doesn't Grow In Supermarkets Worksheet

MATERIALS YOU WILL ALSO NEED:

- Paper plate
- Pen or pencil

Food doesn't grow in supermarkets! We know that foods come from farms, orchards, crops, animals, trees, underground, and even beehives! This activity not only allows the participant to taste a variety of delicious honey, but it also allows for a deeper understanding of where honey comes from and how it is made.

Did you know that the flavor of honey changes based on the season and the region in which it is produced? The flavor of honey is based on the floral variety near the hive. Think about how flowers in your own area look and smell differently. Each flower has its own unique taste for the bee as well. The percentage of fructose, glucose, amount and type of amino acids, and organic acids can also affect the flavor of honey.

When a forager female honey bee visits a flower, she sips the nectar into her mouth using her long tongue, called a proboscis. The nectar mixes with the enzymes that she produces in her mouth, this keeps the nectar from spoiling before she can get it back to the hive. She stores the nectar in her honey sac and flies back to the hive.

She is greeted in the hive by her sisters who sip the nectar into their mouths with their proboscis. They pass the nectar back and forth which helps the water evaporate, causing it to become thicker and more honey-like. The bees store it in the wax honeycombs in the hive and fan it with their wings to evaporate even more water. The bees cap the honey with wax to keep it clean and ready for the hive to eat. To learn more about the process, enjoy this video [How Do Bees Make Honey?](#)

For this Honey Tasting Experience, you will have 4 different varieties of honey to explore. You will use your senses to fully evaluate and experience the 4 kinds of honey. The 4 different varieties are California Orange Blossom Honey, Buckwheat Blossom, Pacific Northwest Blackberry Blossom, and Western Wildflower Honey. Keep these different plants and geographical locations in mind as you explore the honey! The names of the honey will be kept a secret until the end of the activity, don't peak!

STEPS:

NOTE – Follow these steps in order with each honey straw one at a time using the Food Doesn't Grow In Supermarkets Worksheet to record your responses.

1. Inspect your honey straw. Hold it up to a light, what colors do you see? Write down words that describe what you see on your worksheet for "SIGHT" in the column of the straw you are exploring.
Examples: sunshine, caramel, bright, lemon, dark, yellow, black, bubbly, popsicle, creamy, blush, maroon, coral, salmon
2. Watch the honey move. Cut or bite the end of your honey sticks, one at a time. Squeeze a little honey onto a paper plate. What do you notice about the way it moves? Is it fast or slow - that is called the viscosity, higher viscosity means it has a greater resistance to flow, lower viscosity means it moves quickly.
3. Smell the honey. What do you observe with your nose? Write down words that describe the smell.
Examples: raisin, smoke, marshmallow, pineapple, coffee, sugar, sunrise, earth, nut, candy, bite, pucker
4. Taste the honey. Write down the words that describe the taste.
Examples: lavender, woody, fruity, jammy, citrus, floral, dusty, smoky, spicy, berry, earthy, hay
5. Combine your words to create your own name for each honey straw flavor. (Think MadLibs)
Examples: Sunshine Lavender Smoke, Citrus Jammy Candy, Spicy Marshmallow Puff.
Write your Made-Up names on your worksheet.
6. Follow the above steps for each of the straws of honey. Then write the Real name of the honey on the worksheet after you complete the honey tasting.

A = California Orange Blossom

B = Western States Wildflower

C = Buckwheat Blossom

D = Pacific Northwest Blackberry Blossom



Image provided by Nature-Watch.com

CONVERSATION STARTERS FOR ADULT AND CHILD PARTICIPANTS

- Why do you think that the buckwheat blossom honey was so strong? Buckwheat blossom honey has been described as one of the strongest kinds of honey. People frequently use it in recipes, barbecue sauce, and coffee because its flavor is too strong for tea or toast.
- Which honey was your favorite? What would you use this honey for?
- Create a Food Story! Talk about one food you ate today and trace it back to where it most likely originated. For example, if you ate oatmeal, where do you think it came from? How did it get to the store?
- Consider how the beekeeper gets the honey from the hive to the bottle. If you are interested in learning more about how a backyard beekeeper bottles honey, enjoy this [Virtual Field Trip Honey Harvest](#).
- You can support bee populations by buying local honey. It is more vital than ever to support local bee farmers who are helping raise and maintain healthy bees. A good place to start is with your local farmer's market and/or your local beekeeper's association.