The Tech Interactive at Home

Pollinator Pit Stop
ACTIVITY GUIDE

Who says all the fun has to happen at The Tech Interactive? This DIY engineering activity can be done with inexpensive supplies and things you find around your home!

Introduction
Pollinators have one of the most important jobs on earth. Without pollinators to carry pollen from one flower to another, plants could not produce fruit, nuts, or seeds. These foods are important to the survival of all life on earth, including humans! One way we can help our pollinator friends is to build them pit stops, or temporary habitats where they can rest and eat. In this activity, you will learn about an insect and then design and build a pollinator pit stop that will meet its needs.

Design Challenge
Design a temporary habitat for a pollinator insect that can protect it and make it feel at home.

Subject:
Biology

Age:
6+

Time:
60 minutes
3–4 days to observe

Key Concepts:
Habitats, ecology, design thinking

Updated March 2022

Materials

Find a couple items from each category. Don't limit yourself to the items on this list.
Use whatever you have on hand — be creative!

Structural Pieces	Connectors	Natural Materials	Tools
• Cardboard box • Corrugated cardboard • Durable recycled containers (such as a plastic milk jug) • Flat cardboard pieces • Small, thin cardboard tubes • Toilet paper rolls • Wooden box or frame	• Chenille stems (pipe cleaners) • Hair ties • Rubber bands • String • Twist ties	• Bark or old wood • Dried flowers • Leaves • Rocks or gravel • Sticks or twigs • Wood chips	• Scissors • Tape

STEM Storytime

Before you build your pollinator pit stop, check out *Bug Hotel* by Libby Walden. Lift the flaps in this board book to learn more about the insects in our gardens and how to create homes for them.

To find out more about why pollinators are so important, read *What If There Were No Bees? A Book About the Grassland Ecosystem* by Suzanne Slade.

Instructions

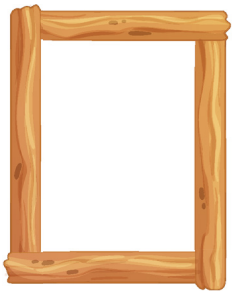
Learn about your pollinator

1. Review the **pollinator cards**, and choose an insect to focus on.
2. Read the information about your pollinator, and think about what kind of habitat will attract it.
   - What do its nesting spots or habitats look like in the wild?
   - What does the pollinator you picked need in order to be comfortable?
   - What do all insects need in order to be comfortable?
   - What features make them feel safe?

Design and Create

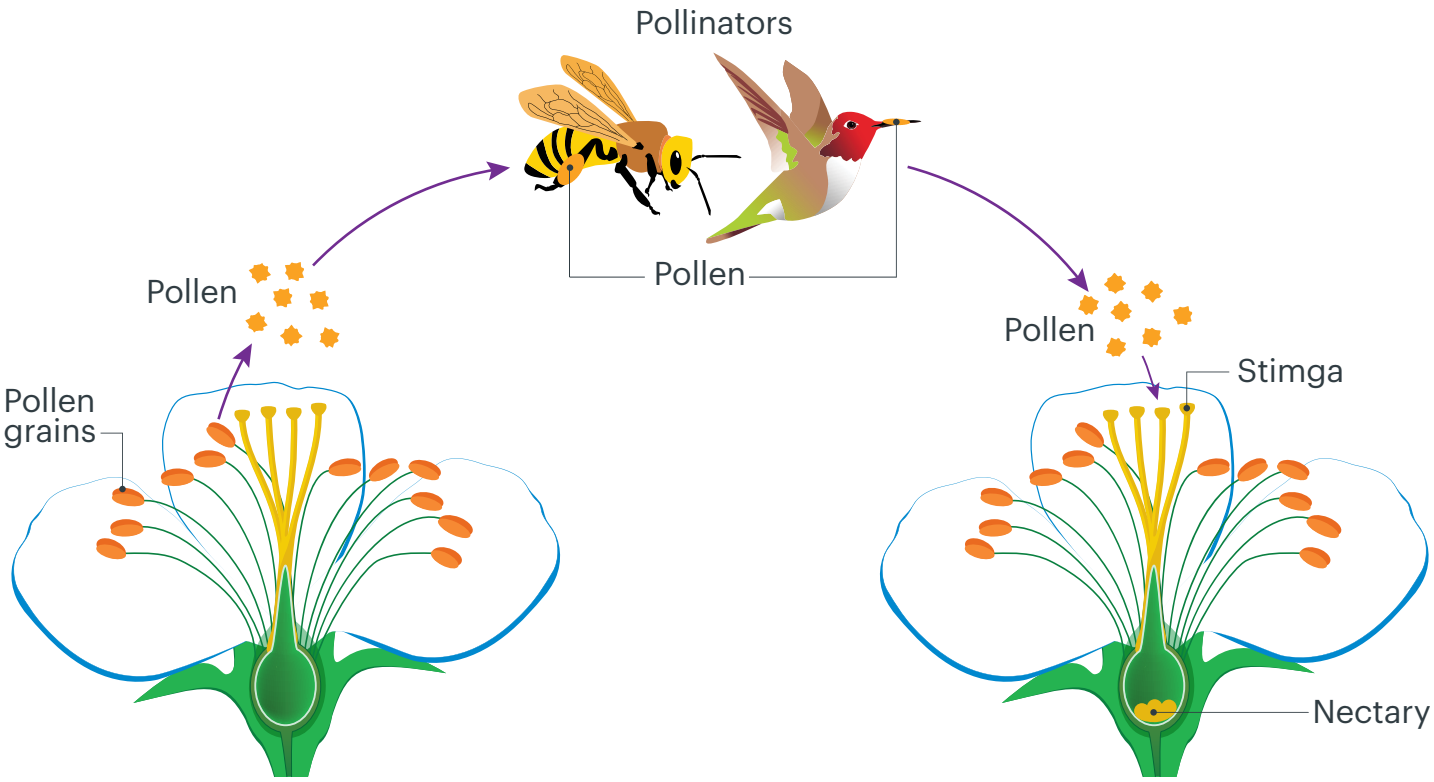
1. Build your habitat using items from around your home, both inside and outdoors.
   - Check the materials list for ideas on items to include.
   - Think about the kinds of natural materials that will make your pollinator feel comfortable.
2. Think about what your pollinator will need from its temporary habitat.
   - Can it enter and exit easily?
   - Is there a place for it to rest?
   - Can it get food and water?

Tip: Beginning engineers might find it helpful to start with a sturdy box or frame. This can provide structure, so that the pollinator pit stop can be built inside, around, or on top of it.



3. After you build your habitat, you can test it outside. Think about how to design an outdoor habitat that...
   - stays dry inside and does not fall apart when it rains.
   - is sturdy enough that the wind won't knock it over.
   - is solid enough to keep out predators.

Did you know that not all pollinators are insects?
Pollinators also include larger animals that eat nectar, such as birds and bats.



Test and Reflect

1. When your pollinator pit stop is ready, put it outside.
   - Add any features from nature (bark, sticks, etc.) that you think will make your pollinator want to visit.
   - If you can, put your habitat near water and plants. Remember, your pit stop is a place for your insect to rest between trips to get pollen from plants.
2. Check the habitat every day or so. Look to see if there are any changes.
   - Use your observation sheet (**Pollinator Pit Stop Guest Log**) to draw what you see.
     - Do you see your pollinator or other insects?
     - Does it look like the habitat has been used?
     - Has the habitat changed after being outside?
   - If you don't see your pollinator, don't worry!
     - Try checking on the habitat at night, using a flashlight. Some insects are more active at night.
     - Think about what season it is. Some insects are more active during certain times in their life cycle. Your pollinator may be more active during the spring.
3. Use what you learned from your observations to redesign and improve your habitat.

Pollinators Need Native Plants

We can help our pollinator friends by growing their favorite plants to provide them with the food and shelter they need. Native plants, or those plants that occur naturally in a certain area and benefit the pollinators that live there.

These local insects and local plants evolved alongside each other and support each other. By contrast, plants brought in from distant places may not provide enough pollen or nectar for the local pollinators, and the insects may stay away from them. In fact, research shows that native plants in Northern California are at least four times more likely than non-native plants to attract native bees! (See **Pacific Horticulture's article** about this research.)

Plants Native to San Jose

Monkey flower

California lilac

Golden yarrow

California wild rose

Learn more about plants native to The Tech Interactive's backyard.

- **Guide on the Right Plant for the Right Place from the City of San Jose**.
- Search **Calscape, California Native Plant Society** for native plants information by zip code.
- Resources for Butterfly Gardening in the East Bay from **Native Here Nursery**.

Explore More

- **Extreme Weather:** Want to make sure your habitat is weatherproof? Try testing it for weather conditions before putting it outside. Use a spray bottle filled with water to see how some splashes of rain will affect the habitat, or run a fan to see if it can stand up to a steady breeze.
- **Human Habitats:** Which of the ideas from your pollinator pit stop would be useful in a human home? Draw some sketches of your ideas or try building a prototype.
- **Pitch to the Pollinator:** Pretend that you have to pitch your habitat design to your pollinator before you can build it. Sketch out your design ideas, and imagine the feedback your pollinator might give you if it could talk. For added fun, have an adult or a family member act out the role of the pollinator.

The Tech Academies

This activity was developed in partnership with educators from **The Tech Academies Fellowship program**, where educators develop leadership skills while designing and testing STEM resources.

Share Your Results! Keep us posted about your design challenges on social media with **#TheTechatHome**.

The Tech Interactive at Home

thetech.org/athome

Pollinator Cards

Choose one of these pollinators, and design a habitat that will keep it happy and safe.

LEAFCUTTER BEE

Lives alone

EATS: Nectar

WATCH OUT FOR: Invaders that take over nests
Flies, wasps, beetles

NESTS IN NATURE: These bees like to build their nests in small holes, like those found in hollow twigs or rotted wood. The bees cut up leaves and petals to line their nests, which is how they got their name. If you have ever seen leaves with strange circular holes, it was probably the work of a leafcutter bee!

FAVORITE CALIFORNIA NATIVE PLANTS: Western redbud, catmint, California milkweed, and sunflower

VARIABLE CHECKERSPOT

Lives alone

EATS: Nectar

WATCH OUT FOR: Bird predators
Female insects are more likely than males to be attacked because they have less red color on their wings.

NESTS IN NATURE: These butterflies like to rest by hiding in leaves or the cracks of rocks, or by hanging upside-down from leaves or twigs.

FAVORITE CALIFORNIA NATIVE PLANTS: California honeysuckle, seep monkey flower, Rocky Mountain bee plant, Wight's paintbrush, and California rose

LADYBUG

Some species live alone, OR some live in groups

EATS: Aphids, nectar, pollen

WATCH OUT FOR: Birds, frogs, spiders

NESTS IN NATURE: These beetles like to rest in dark, hidden spots, such as under bark, in cracks in trees and wood, or under dead leaves on the ground.

FAVORITE CALIFORNIA NATIVE PLANTS: Dill, daisies, German chamomile, white lace flower, mini marguerites, fall asters, sunflowers, and cosmos

HOVERFLY

Lives alone

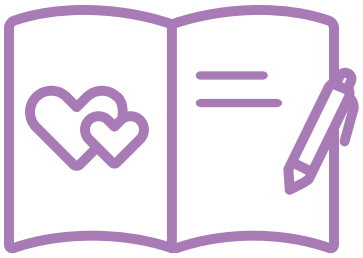
EATS: Nectar, pollen

WATCH OUT FOR: Birds, frogs, spiders, reptiles

NESTS IN NATURE: These flies look for places under leaves or branches to rest.

FAVORITE CALIFORNIA NATIVE PLANTS: Calendula, cosmos, cornflowers, meadowfoam, Queen Anne's lace, butterfly bush, yarrow, and goldenrod

Pollinator Pit Stop Guest Log



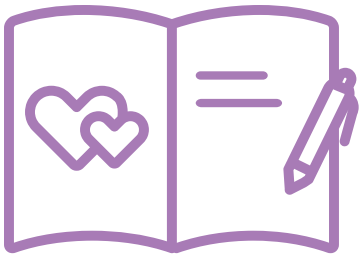
Check on your habitat at least once a week, and draw what you see.

- Have any pollinators or other insects visited? How do you know?
- Does the habitat look different? Circle any changes you see.

Week 1

Week 2

Pollinator Pit Stop Guest Log



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Week 3

Week 4