TEXAS STATE UNIVERSITY

The rising STAR of Texas

Minding the Hill Country Pollination Partners Survey

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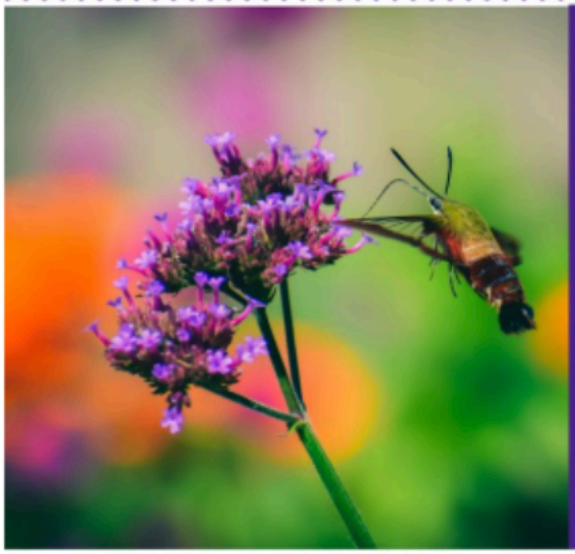
Minding the Hill Country...

is about inspiring people to spend more time exploring the natural world around them. We want to encourage and support people of all ages, abilities, and backgrounds to enjoy and study wildlife in their local area and to observe and record information about the local environment.

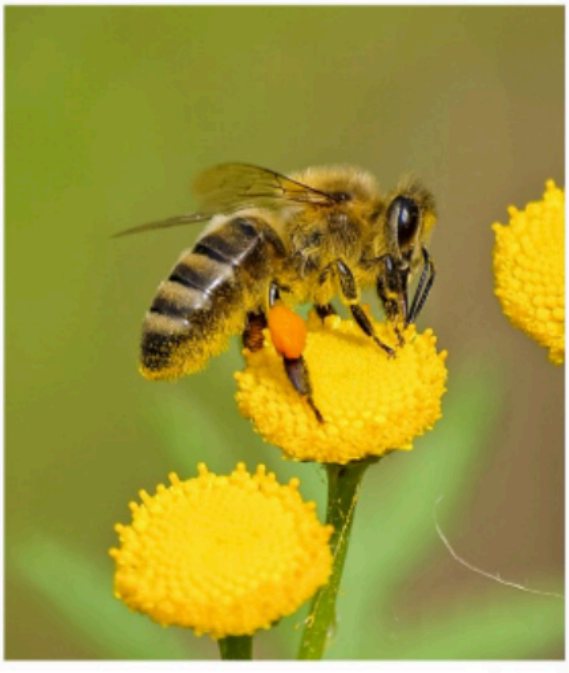
To learn more about this project, visit mindingthehillcountry.wp.txstate.edu



Pollination Partners

You will become a community scientist during this activity! You will conduct a pollinator investigation in your area and contribute to local science. It takes about 30 minutes to an hour to complete. Have fun!

Contents



What is pollination?

Pollination is the transfer of **pollen** from the male part of one flower to the female part of the same or another flower. It is a very important part of the plant life cycle because it allows plants to reproduce and make seeds.

What are pollinators?

A **pollinator** is something that carries **pollen** from flower to flower. Animals such as bees, butterflies, and bats can be pollinators. They get pollen on their bodies as they eat **nectar** from a flower. As pollinators move from one flower to another in search of food, the pollen on their bodies transfers onto the next flower. This results in **pollination**. Wind and water can also act as pollinators by spreading pollen from flower to flower.

Why are pollinators important?

Pollinators are responsible for **one** in every **three bites** of food that we eat!

About **80%** of all plants need to be pollinated to reproduce.

About **10 billion** dollars worth of food United States is dependent on pollinators!

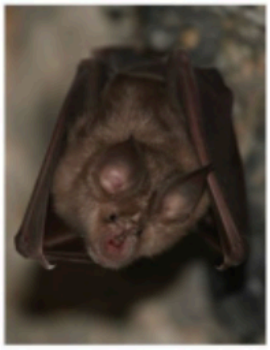
Over **150 foods** in the United States are dependent on pollinators for reproduction. Here are a few examples:

Texan Pollinators

Texas is home to many amazing types of pollinators. Here are some common kinds that you might see outside:

Bees have pollen baskets on their legs that collect pollen while they visit flowers. A common type of bee to look for in Texas is bumble bees. Bumble bees are large bees with yellow and black stripes and fuzzy hairs that pollen can stick to.

Butterflies drink nectar through a straw-like structure called a proboscis. Did you know that butterflies can smell through their feet? A common type of butterfly in Texas is the Monarch. Monarchs migrate 3,000 miles from North America to Mexico and back every year!



Bats like to hunt at night. They get pollen on their bodies while looking for insects in big flowers. Every night, people can go and watch millions of bats fly out from under the South Congress Bridge in Austin, TX.

Hummingbirds drink nectar using their long and narrow beaks. Pollen sticks to their feathers while they drink nectar. Their hearts beat at 1200 beats per minute! The ruby-throated hummingbird is a type of hummingbird that lives in Texas. They have green bodies and a gorgeous red mark on their necks.

Moths typically eat at night, like bats. They use a proboscis to drink nectar from flowers that open at night. Pollen gets stuck to their wings while they are drinking nectar. Sometimes a moth's proboscis can be longer than its entire body!

Beetles get pollen stuck to their bodies while eating flower petals. They roll around in flowers while eating. Two kinds of beautiful beetles found in Texas are the Texas flower scarab and the lady beetle. Keep your eyes peeled for beetles in big white flowers!

Let's Investigate Pollinators!

What you need to start:

- Pencil or pen
- Clipboard or binder to write on
- Printed Activity Kit
- Watch or Timer (such as on phone)
- *Optional* - Camera (such as on phone)
- *Optional* - iNaturalist App

Now that you have your supplies, go to an outdoor area with flowers. This can be your front or back yard or a local park.

Safe Science

Observing wildlife is a lot of fun, but there are a few ground rules you should follow to keep you and the wildlife stay safe:

Give animals **space**. Keep a safe distance from any wildlife you see.

Do not touch wildlife or their habitats.

Stay **calm** and **quiet** around wildlife. **Respect** their habitat.

Do not make sudden movements around wildlife.

Field Scientist Information

First name: _____ Last Name: _____

Date: _____ Time: _____ AM/PM (Circle One)

Who are you doing this activity with today?

(Select all that apply)

- ☐ Myself
- ☐ Family
- ☐ Friend(s) (not classmates)
- ☐ Classmate(s)

Site Observations

What type of location are you in? (Select the best fit)

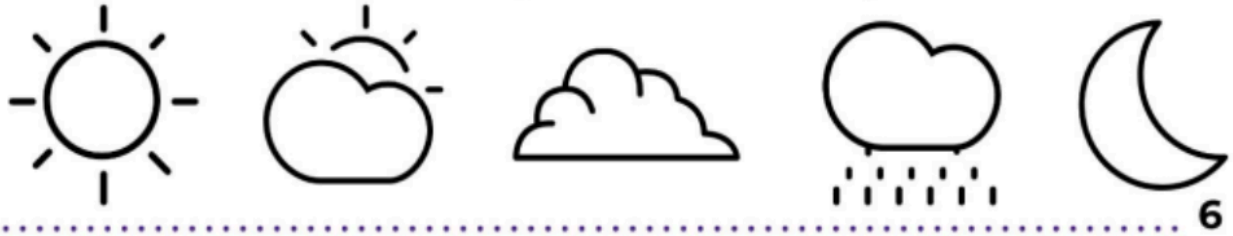
- ☐ Schoolyard
- ☐ Park
- ☐ Garden/Flower Pot
- ☐ Hiking Trail
- ☐ Front or Backyard
- ☐ Beside the sidewalk
- ☐ Other (please describe): _____

How windy is it? (Select the best fit):

- ☐ The leaves on the trees are not moving.
- ☐ The leaves on the trees are moving a little.
- ☐ The leaves on the trees are moving a lot and strongly.

Temperature: _____ (F°)

What is the weather like? (Select the best fit):

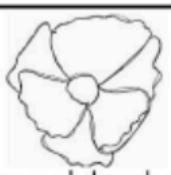


Instructions

Today, as a community scientist, you will be finding three different flowers, describing these flowers, and recording the types of pollinators that visit them. After that, you will have the option to post pictures of what you find to iNaturalist .

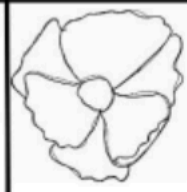
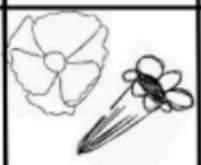
Step 1: Find & Describe 3 Flowers

Walk around your outdoor area and find three different flowers. Describe the color, shape, and smell of each flower below. Check out the pollinator guide on page 8 for an example of describing flowers.

Flowers	Color(s)	Shape	Smell
Example	White and green	 Large and bowl shaped	Strong & sweet smell, like my grandma's perfume
Flower 1			
Flower 2			
Flower 3			

Pollinator Guide

Different types of pollinators prefer different types of flowers for food. The table below describes common traits pollinators looks for in a flower. Some flowers may attract multiple pollinators.

	Type of Pollinator					
	Bat	Butterfly	Bird	Bee	Moth	Beetle
Flower Color	green purple white	red purple	red orange white	yellow blue white	pale pink pale purple white	green white
Flower Shape	 Large, bowl shaped	 Narrow, tube shaped with a landing pad	 Large, tube shaped	 Shallow with landing pad	 Either tube shaped or a wide landing pad	 Large, bowl shaped
Flower Smell	Strong, musty	Faint, but fresh or pleasant	none	Mild and fresh or pleasant	Strong and sweet	Mild, not too sweet or foul

Step 2: Make Predictions

Using your flower descriptions and the pollinator guide above, predict the type of pollinator(s) that will visit each of your three flowers the most often. Explain your predictions.

1. I predict that _____ will visit flower 1 the most because_____.

2. I predict that _____ will visit flower 2 the most because_____.

3. I predict that _____ will visit flower 3 the most because_____.

Step 3: Observation & Data Collection

Go to Flower 1. Start a timer for 5 minutes. Tally all the pollinators that visit flower 1 in the space below. Be sure to record the type of pollinator and how many times each type of pollinator visits. Stop tallying when the 5 minute timer goes off. Repeat this process for flowers 2 and 3.

Number of Pollinator Visits							
Flower	Bat	Butterfly	Bird	Bee	Moth	Beetle	Other/ Unknown
Example		|||	||				|||
Flower 1							
Flower 2							
Flower 3							

Use your data to describe how your observations from Step 3 compare to your predictions from Step 2.

1. My data shows that my prediction for flower 1 was (circle one) **correct / incorrect** because _____
_____.

2. My data shows that my prediction for flower 2 was (circle one) **correct / incorrect** because _____
_____.

3. My data shows that my prediction for flower 3 was (circle one) **correct / incorrect** because _____
_____.

Sometimes, pollinators will not show up. This is totally normal!

If you did not see any pollinators during your data collection today, what do you think kept the pollinators from visiting your flowers?

Questions

1. What type of pollinator(s) visited your flowers the most?
   Flower 1:
   Flower 2:
   Flower 3:

2. Why do you think these pollinators visited your flowers?

3. What is your favorite type of pollinator and why? (Ex. Bats, birds, bees, etc.)

4. Describe what you could do to attract your favorite pollinator to your yard or patio.

5. The pictures below show two pollinators that live in Texas.

Monarch Butterfly

Lo Moth

Both animals have specific structures for eating and preferences for flower traits when looking for food sources.

Which sentence best describes what these two pollinators have in common?

A. Both pollinators are attracted to flowers that bloom at night.
B. Both pollinators prefer white and strong smelling flowers.
C. Both pollinators use a straw-like proboscis to drink nectar from tube shaped flowers.
D. Both pollinators are attracted to bright flowers such as marigolds and flowers with a faint and fresh smell.

Post Activity Questions:

1. What part of this activity did you enjoy the most?

2. What part made you feel the most like a scientist?

3. What part was the most helpful to you in learning about pollinators?

4. What was the most important thing you learned?

Post-Activity Survey

Read each sentence and then check the box that best describes how you feel about that sentence:

	Strongly Agree	Somewhat Agree	Neither agree nor disagree	Somewhat Disagree	Strongly Disagree
It is fun looking for things in nature					
I like to learn about nature.					
I enjoy spending time outside in nature.					
I think about nature when I am outside.					
I do things without paying attention.					
I rush through activities when outside.					
I understand how my actions impact nature.					
Nature has value even when not used by humans.					
I do not think I am a part of nature.					
I pick up trash I find outside.					
I try to not disturb animals outside.					
It is not my job to take care of nature.					

Cultural Connection

The start of November marks the beginning of Dia de los Muertos (Day of the Dead), a cultural holiday celebrated throughout North and Central America. This holiday honors family members and friends who have passed away. People decorate their homes and streets with their family's favorite meals and music. They also put out bright orange marigold flowers. The scent and color of these flowers are believed to guide the spirits of family members home for the holiday! Monarch Butterflies migrate to Mexico every year at the same time as Dia de los Muertos. Monarchs love marigolds and flock to these flowers during their migration. Because of this, many people believe that Monarchs are the souls of their ancestors coming home. During festivals and parades celebrating Dia de los Muertos, dancers often wear traditional outfits that use the beautiful colors of Monarch Butterflies.

Working with Pollinators

"When we improve biodiversity, we improve the health of our planet." - Dr. Shalene Jha

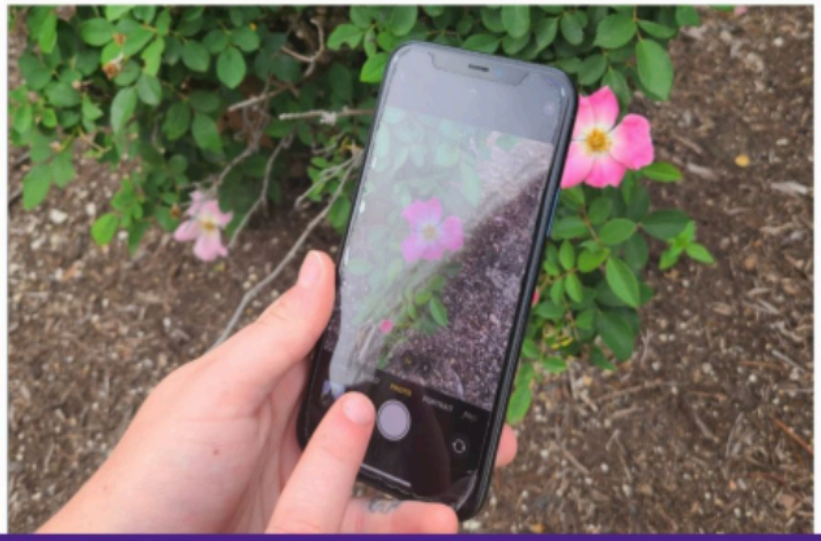
Local scientist, **Dr. Shalene Jha**, studies pollinators at the University of Texas at Austin. She works with other scientists to explore questions like:

- How are pollinators affected when cities are built?
- What happens to pollinators if we add wildflowers to cities?
- How do farmers and gardeners affect pollinators?
- What can we do to help improve pollinator biodiversity?

Dr. Jha is currently working on restoring prairie habitat in Texas and Oklahoma for pollinators. Her favorite part of the job is getting to work with students, community members, farmers, gardeners, and other scientists to come up with ideas that help both pollinators and humans.

Step 4 (Optional): Post to iNaturalist

Optional: Take clear pictures of flowers 1, 2, and 3, and any pollinators that you see! You can take as many pictures of each flower and pollinator as you want.



1. Visit the website at iNaturalist.org or download the app. If you already have an account, log in. If you don't have an account, you can create one:
    a. Click 'Sign Up'
    b. Create an account

2. Once you have created an account, log in on the app or website to post your pictures.
    a. App: Click 'observe'
    b. Website: Click '+ add observations'

3. Select or upload your pictures of flower 1. You can click 'What did you see?' on the app to find out the name of your flower. Suggestions automatically pop up on the website.

4. Add notes about the picture (optional) and click 'Share' or 'Submit observation' to post your observations.

5. Repeat steps 2-4 for flowers 2 and 3 and any pollinators you take pictures of!

Extra Activities & Information

Texas Pollinator Guides

Eastern Tiger Swallowtail [9]
Papilio glaucus

Two-tailed Swallowtail [10]
Papilio multicaudata

Bees, wasps, and flies:
https://txmn.org/llano/files/2021/02/Texas-Bee-ID-Guide.pdf
Butterflies and Moths:
https://www.inaturalist.org/guides/3225

Video about Texas Pollinators

https://www.youtube.com/watch?v=btDJodzetNk

How can you help pollinators?

https://austintexas.gov/blog/10-ways-love-our-pollinators

Plants for Pollinators

https://www.wildflower.org/collections/

Build a pollinator house

https://www.thespruce.com/build-a-diy-bee-house-5112611

Learn more about Dr. Jha's lab

https://w3.biosci.utexas.edu/jha/people

Please return your completed booklet to your teacher.