

TaHome Nature Education: Pollinators

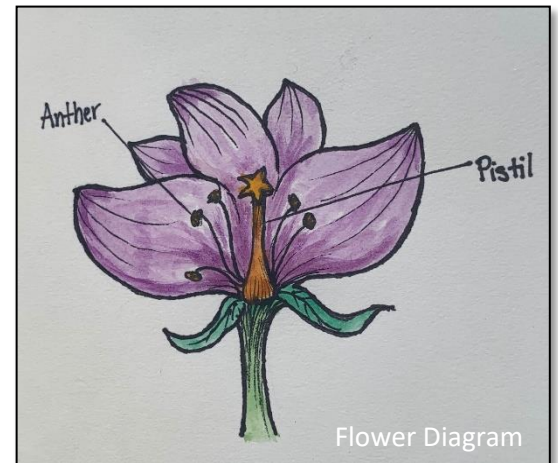
Grades 3-5



Reading: Bees, Butterflies, and Birds

What is a Pollinator?

Spring brings color to Tahoe in the form of flowering plants. As plants become more abundant, so do the animals that have important relationships with those plants. **Pollinators** are animals that visit plants to eat the flower's nectar and pollen. **Nectar** is the sweet liquid produced by a flower, and **pollen** is the flower's nutrient rich powder that plants use to reproduce. Pollinators include many insects such as bees, wasps, beetles, flies, and moths, but also birds, spiders, bats, and other animals. As they visit each flower, dusty pollen from the **anther**, or male part of a flower, attaches to their bodies. On that same flower and other flowers that the pollinator visits, the pollen on their bodies spreads to the **pistil**, or female part of the flower. The transfer of pollen helps plants to create seeds and fruits resulting in more flowers.



Pollinators are very important to a healthy ecosystem. There are over 100,000 different animal species who are known pollinators. Without pollinators, many flowers would not be able to produce fruit or seeds, and there would be far less food in the world for all animals, including people. If pollinators disappeared, so would foods like tomatoes, apples, almonds, blueberries, avocados, chocolate, and sugarcane. Honeybees in the United States alone help create \$10 billion worth of crops every year.

Some plants rely on processes other than animal pollinators to help them pollinate and grow their seeds. Many plants that such as wheat, rice, pecans, corn, and oats are pollinated by the wind. These plants release enormous amounts of pollen (much more than plants pollinated by animals) into the air to hopefully be carried to other plants. But this is inefficient and most of the pollen simply drifts away. Tahoe's pine trees do this and in early summer, you can see the pollen form clouds or a thin layer on the surface of the water, including Lake Tahoe itself.

Plants growing in the water, like seaweed and pond weeds, are pollinated by the water around them. These plants release pollen that is carried by the water around to other plants, much like the wind carries pollen.

How does a pollinator choose what flower to land on?

There is a reason flowers stand out with their often bright, colorful petals, sweet scents, and interesting shapes; because certain pollinators are attracted to different flower characteristics!



Butterflies and birds are attracted to red and yellow colors, like those found in the flowers of dandelions, buttercups, paintbrushes, bitterbrush, and rabbitbrush. Tahoe's hummingbirds are especially attracted to the color red. One bright red Tahoe plant popping up in the spring is Snowplant. This unique plant clusters in Tahoe forests and is a food source for hummingbirds, who enjoy its nectar and find it earlier in the year than other food sources.



Bees see different colors than people. They can't see red well, and are instead attracted to blues and purples. Bees see different than humans and have the ability to see ultraviolet colors that people can't see without a special tool. For this reason, they are attracted to blue and purple flowers, like lupines, larkspurs, and violets. Moths and bats who feed at night are attracted to white or pale colored flowers that can be seen against the dark of night, including flowers like evening primrose that may only open in the nighttime.

Some pollinators, like flies, beetles, or ants, may not have great vision, but are attracted to a flower's scent. Plants can produce chemicals that diffuse through the air, leading pollinators to them. Some plants have evolved to produce odors that wouldn't smell good

to people. Flies are attracted to the aroma of rotting meat and other unpleasant smells, so some flowers, like carrion flowers and skunk cabbage create a similar scent that attracts flies.

Flower shape affects which pollinators can access their pollen and nectar. For example, butterflies pollinate flowers with flat surfaces that are large enough for them to land on. Other pollinators, like hummingbirds, never land on flowers, but hover near them while they drink nectar instead. The flowers they feed on usually hang down and have long tube-like shapes. Flowers pollinated by beetles need to be sturdy and have an easy entrance, as beetles are clumsy in their flight.



Yarrow makes a flat landing pad for this California Sister butterfly.

One important Tahoe pollinator is the White-lined Sphinx Moth, which is migrating back into Tahoe from southwestern deserts right now. This is a hovering pollinator that uses its long tongue, called a proboscis, to reach into flowers and eat the nectar. You can find these large moths flying around through the summer, beating their wings very quickly (they can fly up 30 miles per hour) and looking just like a small hummingbird.

Although fruit eating bats are important pollinators in other parts of the world, like Asia and Central America, the sixteen bat species that live in Tahoe are all insect eaters, and are not pollinators.



Many red flowers favored by hummingbirds are shaped to deposit pollen on the birds' heads.



Two different Longhorned Beetles
Visit a Corn Lily



Activities for Grades 3-5

Color Walk

1. Go for a walk around your neighborhood on a warm, sunny day to search for flowers, whether they are in gardens or are wildflowers.
2. Bring a pencil and notebook to write down the colors of all the flowers you see. Walk until you have recorded the color of at least 20 different flowers.
3. Stop at one flower to look closer. Sit still, stay quiet, and watch this flower for at least 10 minutes. Write the color of the flower you are observing and all the pollinators that visit this flower. Can you see any pollen on any of the pollinators?



Next discuss these questions with a family member:

1. What color of flower did you see the most of?
2. Did you see mostly planted or wild flowers?
3. What pollinators did you see? What color of flowers were they pollinating?
4. Where did you find the flowers growing?

If you want to learn more, repeat this activity at dusk to see if you notice different pollinators or flowers.

Butterfly Bath

Butterflies and other pollinators need water and other minerals just like you do. To help them out on their busy pollinating days you will need a small bowl or dish that you can leave outside, a few rocks, a little sandy dirt, and some water. Follow these instructions:

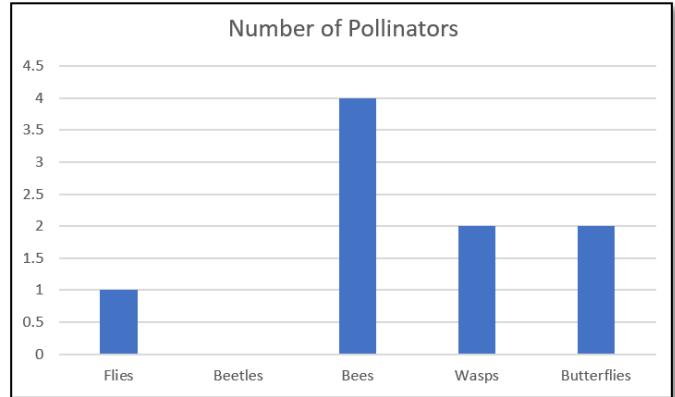
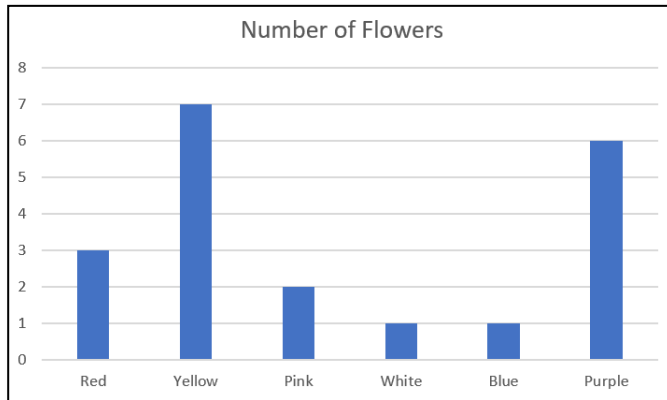
1. Fill your dish or bowl with just an inch or two of water. It should be pretty shallow.
2. Place the rocks in the butterfly bath. Place dirt in one corner of the bath. Make sure some of the rocks stick up above the water, so that pollinators have somewhere to land while they take a drink.
3. If you can, place your butterfly bath somewhere near flowers, or in a garden.

Watch your butterfly bath for a few days to see if any pollinators use it. If you don't see many, try moving it to another spot. Send a picture of your butterfly bath to a family member far away and tell them about the pollinators you have seen using it. Teach them how to make their own butterfly bath.



Graphs

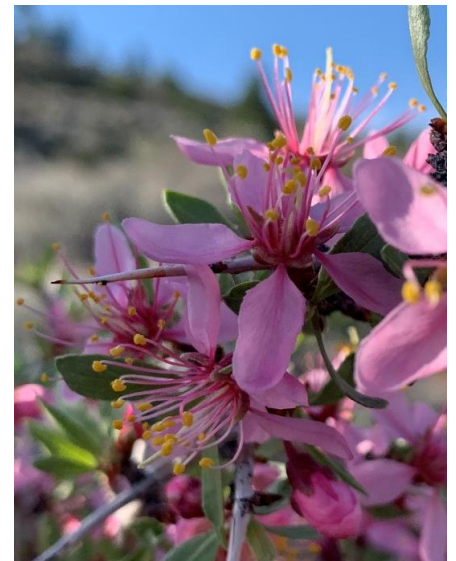
Using your data from the Color Walk, create two bar graphs. Create one bar graph of the colors of flowers you saw. Create a second bar graph of the number of pollinators you saw on your flower. Look to the examples on the left for help. If you need more help with how to make a bar graph, check out [this video](#).



Flower Dissection

Find or collect three different flowers. Only take a flower if you see 20 others just like it within two feet. Make sure to take only one. Leave the rest for the pollinators to eat and to make new seeds. Carefully pull apart the flowers you collected into their smallest parts. Can you find the anther and the pistil? Can you find the pollen? Feel all the parts of the flower. If you have a magnifying glass, use it to look closely at the parts of the flower. You can also [make your own magnifying glass](#) from a recycled clear bottle.

Use what art supplies you have to paint, sculpt, draw, or build one or all of the flowers you collected. Make sure to include all of the parts of the flower that you find in your art. TINS wants to see your art! Have your parent post a photo of your art project to Facebook and tag [Tahoe Institute for Natural Science](#). You could also email the photo to us at education@tinsweb.org.



“Bee” a Pollinator

Try being a pollinator yourself using two methods of pollination. Find at least two items from your house that are light and small, such as brown sugar, rice, or oats. These are going to be your “pollen”. Take these items outside and bring something large and white, like a piece of paper or white sheet. Put your white surface on the ground. Take a handful of your first “pollen”. Be the wind and blow your pollen toward the white surface. After, check your white surface to see how much of your pollen has spread. Keep trying, until most of the pollen is off of your hand. Now repeat with at least one other kind of “pollen”.

Now try pollinating by touch. Put some “pollen” on a plate. Take it outside and press your hand into the pollen. Now touch your white surface in a few different spots. Check your white surface to see how much of your pollen has spread. Now repeat with at least one other kind of “pollen”.

Discuss these questions with a family member:

1. Which pollen that you tested by blowing like the wind spread the most?
2. Which pollen that you tested by touching like a pollinator spread the most?
3. Which method of spreading pollen worked best for each type of pollen?



Words to Know

Pollinator: An animal that moves pollen from the male part of flowers to the female part of flowers.

Nectar: A sugary water with other vitamin and minerals that flowers produce.

Pollen: Tiny grains produced by flowers that have starch, oil, and other nutrients.

Anther: The male part of a flower that produces pollen.

Pistil: The female part of a flower that moves pollen to the eggs to produce seeds.



Many species of flower-pollinating beetles mimic wasps.

Palabras para conocer

Polinizadora: Algo que hace el proceso mediante el cual el polen llega al estigma de una flor.

Néctar: Sustancia líquida dulce que se encuentra en el interior de algunas flores y sirve de alimento a los insectos.

Polen: Polvo fino y fecundante contenido en la antera de los estambres de las flores.

Antera: Parte superior del estambre de la flor que contiene el polen.

Pistilo: Órgano de reproducción femenino de la mayoría de flores que tiene forma de botella y suele estar situado en su centro

Further Learning

[Download](#) a TINS activity book for more pollination fun.

[Build](#) a hummingbird feeder from recycled items around your house.

[Learn](#) more parts of a flower.

[Watch](#) this video on pollination.

[Play](#) a pollination game.

