

**4-H at
HOME**



4-H Pollinator

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POLLINATORS ISSUE

The Ant



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THE ANTS GO MARCHING...



OVER 22,000 SPECIES

Get this: There are 1.5 million ants for every person on earth! Ants have been around since before the dinosaurs, and today they have colonized every continent in the world except Antarctica (it's too cold). Ants are successful because of their ability to adapt to their existing conditions and diverse habitats. There are about 22,000 species of ants worldwide (the ant family of species is called Formicidae), many of which are found in the earth's tropical rain forests!

ANTS ARE SCAVENGERS

Ants are omnivores, which means they eat both plants and animals. An ant's diet also includes meats, seeds, plants, and fungus. Really, they love to eat almost anything, but especially fruit, nectar and sugary items, including the flowers on fruits and vegetables. That's how they pollinate plants, going from one sweet flower to another. They also drink the dew that gathers on plants.

And ants are very social, working together to forage for food. It often takes many of them to bring back large pieces of plants, animals, and insects to eat and share. They leave a pheromone (smell) trail, to help them and other ants in their colony retrace their route back to the nectar or other food sources.

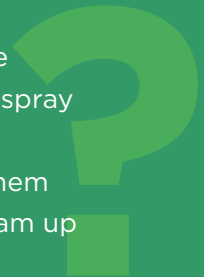
ARE ANTS GOOD POLLINATORS?

Unlike most pollinators, ants can't fly from plant to plant, since they lack wings (at least, most of them). That makes them more likely to take nectar without effectively cross-pollinating flowers.

They typically forage only short distances, making them inefficient at carrying pollen over long distances between plants and their nests. But some plants do need ants to pollinate them – particularly plants in harsh, dry lands, which seem to rely on ants because these are places where there may be few other pollinators available. These busy insects are often observed visiting inconspicuous, low-hanging flowers to collect the energy-rich nectar they crave by crawling into each flower to reach their reward.

DID YOU KNOW?

Black ants and wood ants have no sting, but they can squirt a spray of formic acid when they feel threatened. This can protect them from larger predators. Ants team up and work together to fend off intruders to their colony to protect the queen and babies. Some birds put ants in their feathers and under their wings, using the formic acid the ants produce to eliminate parasites.





TYPES OF ANTS

WHAT COMES IN A COLONY OF ANTS?

- 🍷 **Soldier ants** (females) for protection.
- 🍷 **Working forage ants** (females) to gather food. **Did you know?** A foraging group is called a RAID
- 🍷 **Nursery ants** (females) to care for the babies
- 🍷 **One sizable queen** per colony produces eggs day and night.
- 🍷 **Drones** (males), whose job it is to mate on the queen

Both the queen and the male drones rarely leave the nest area. When a queen ant dies, she isn't replaced and her colony generally dies out in a matter of months. Most varieties of ants do not have wings. When they do, only queens and males have wings. Ants are hostile to other ants, and colonies wage wars and take over other colonies - the losing colony become ants that work for and protect the winning colony.



Queen



Male



Normal-sized worker

Soldier

PARTS OF AN ANT

THE ABDOMEN:


Within the ant's abdomen are two stomachs. One stomach is used for personal energy/fuel storage, while the other one is used to carry food back to the anthill to share with other ants. The abdomen is located at the back end of the ant, and a blood tube and a nerve cord run from the ant's head all the way to the abdomen, in the rear.


THE THORAX:


This is where the ant's six legs attach. There are no lungs in the thorax, because ants don't have lungs - they breathe through tiny holes all over their bodies.

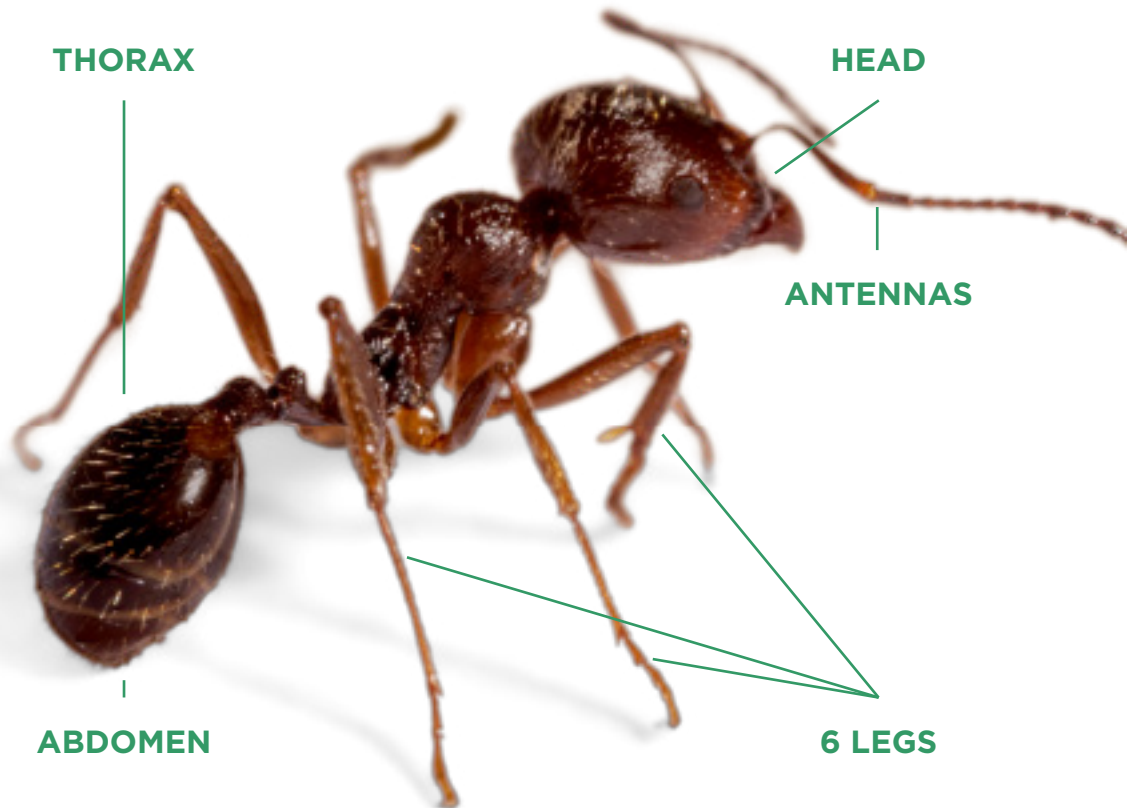
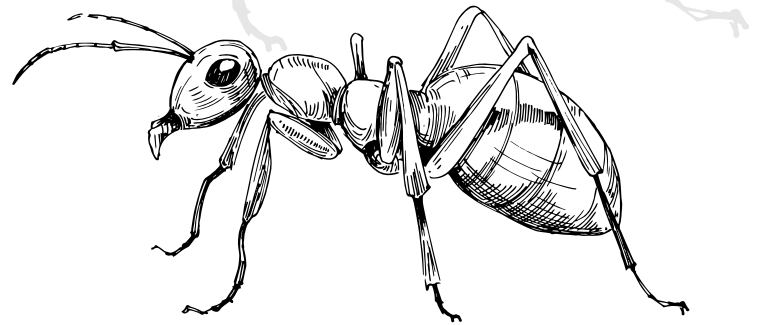
THE HEAD:

The head has three key elements that help ants thrive in any environment.

 **The mandibles:** A pair of strong jaws used to crush food and bite, that open and close almost like scissors

 **Their eyes:** Ant eyes have many lenses, which enables them to see very well.

 **Two antennae:** These are used to smell, touch, taste, and hear. This is how ants communicate, by touching each other with their antennae (antennae is the plural of antenna).



FUN FACTS

THE LIFE CYCLE

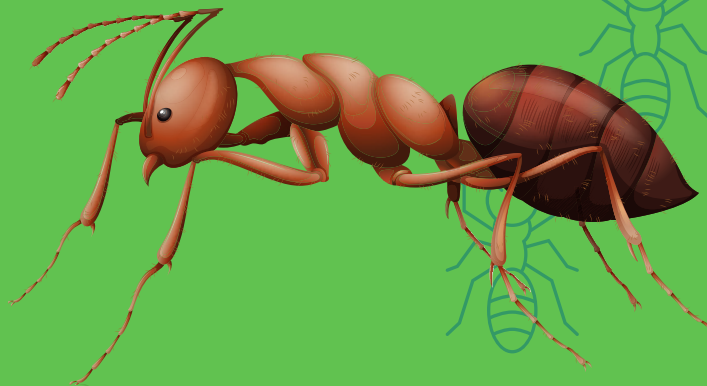
When the queen lays a fertilized egg, the life cycle starts. The egg will turn into larva, then it spins silk to create a cocoon, or pupa, which eventually turns into a white, transparent-looking ant at birth. Ants live about 60 days, except for the queen ant, who can live up to 20 years!

ANT HILLS

What you see as ant hills, the mounds of dirt rising a few inches out of the ground, are the front doors of ant colonies filled with thousands to millions of other ants. These communities go deep into the ground. The ant hill serves as the opening to a maze of tunnels beneath the surface and is the only part of the colony that shows above ground.

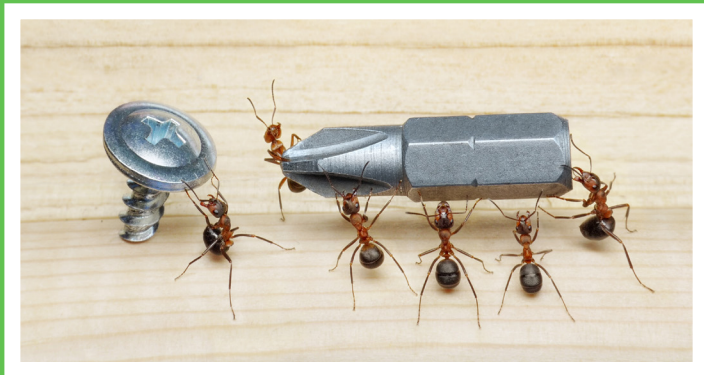
ANTS HAVE DUTIES

Ants never sleep! They spend all of their time caring for their home, newborns and their queen. They build tunnels and gardens of fungus, for food. Ant culture requires that they work together to accomplish their work.



SUPERHEROES

Ants are the superheroes insect world, because their strong muscles and bodies allow them to lift objects that are 20 to 100 times their own body weight. That's like a person lifting a car up over their head. Pretty impressive!



MAKE YOUR OWN

Clothespin Ant



ABOUT THE ACTIVITY

Using pipe cleaners, glue and a clothespin, you'll make a fun craft ant and learn about the role they play in pollination.

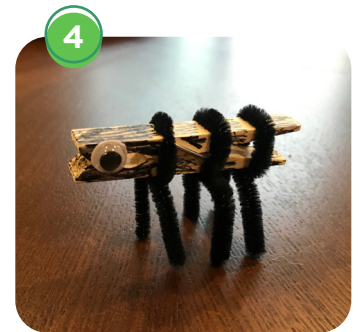
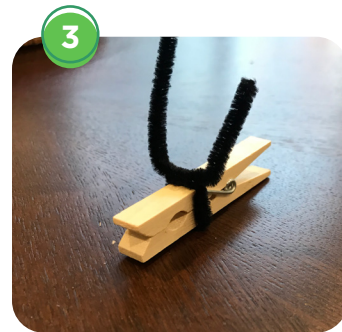
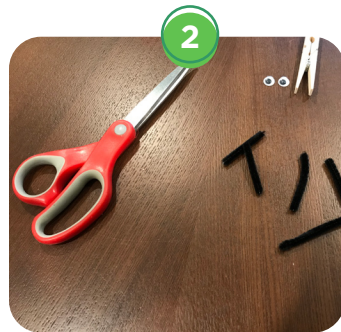
Follow these simple steps to create your ant.

Before you start the activity, think about this amazing fact: Ants have been around longer than the dinosaurs. There are lots of different kinds of ants: 22,000 different species, with many living in the rain forests.

Like butterflies, ants go through three life cycles: larva, cocoon or pupa, and then they become an ant.

MATERIALS

- Mini clothespin
- Pipe cleaner of the same color cut into six equal pieces, 2 inches each
- 2 googly eyes
- Glue
- Black marker
- Disposable table covering



STEP 1:

Glue all six legs onto the clothespin (three on each side), starting around the hinge and going to the rear. Leave room at the front for the ant's head.

Did You Know?

Ants aren't as good of pollinators as butterflies and bees because they can't fly from flower to flower (though some types of ants have wings). But they still love nectar.

- Ants have five main body parts: abdomen, thorax, head, antennae, and legs, of which they have six.
- The thorax is where the ant's six legs attach.
- The ant's abdomen is at its back end.

Did you know an ant has two stomachs in its abdomen? One for energy and fuel for itself, and one to store food for other ants.

- Ants have two antennae. The antennae help them smell, touch, taste and hear. To communicate with each other, ants touch their antennae together.

STEP 2:

Allow to dry. Then glue the googly eyes on the front sides.

Did You Know?

In addition to nectar, ants eat plants and animals, too, meaning that they are omnivores. Like you, ants drink water, seeds and meats. But they also eat fungus. Eww!

STEP 3:

If the legs won't stick by gluing them, cut 3 four-inch strips of the pipe cleaners, and wrap them around the clothespin, twisting them underneath, then bending the legs downward. And if your clothespin isn't a dark color, like an ant, use a marker to color it - you can use black or red, if you want a red ant!

STEP 4:

Enjoy your Ant!

Did You Know?

Ants can lift 20 times to 100 times their own bodyweight. That would be like you lifting a car!

Brought to you by Corteva, Colorado State University and University of Illinois



FIRE ANTS

FIRE ANTS ON WATER

When heavy rain comes or they encounter a large puddle, fire ants can create floating rafts by linking their legs together. So when their home is flooded they are able not just to survive, but to continue to move around and work!

FIRE ANTS

Many people stay far back when they see fire ants – and for good reason. Red ants, or fire ants, are known for being aggressive and having quite a bite. Their bite can be itchy and painful, though otherwise these ants are mostly harmless to humans. That’s not the case for fellow insects – those same bites can be deadly to prey, as they sting them with a toxic venom called Solenopsin. There are over 200 species of these red ants, living all around the world.



Sources: <http://antsandtheplanet.blogspot.com/2012/03/>, <https://www.pestwiki.com/ants-facts/>

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POLLINATORS ISSUE

The Bat



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BATS, BATS AND MORE BATS



OVER 1,300 SPECIES

Bats are shy, gentle creatures, and are the only mammals that can fly. As mammals, they are warm-blooded, and generally have one baby, or pup, per year. The newborn pup is remarkably large at birth – almost a third the size of its mother. Imagine if human babies were born a third the size of their moms! The pup clings to its mother's fur, and nurses milk for a couple months, tucked near the mother's armpit for warmth and safety.

BATS AS POLLINATORS

Bats are nocturnal, which means they are awake and active during the night. They feed on bugs, fruit, frogs, fish and nectar from flowers. Nectar-feeding bats fly to a flower and use their long snouts and tongues to dip in and out of the flowers, while their powerful wings keep them hovering in mid-air. There are tiny hairs on their tongues that serve as miniature spoons to scoop and drag up the delicious sap. While they eat this tasty nectar, some pollen gets on their fur and transfers to other flowers as they make their feeding rounds. That transfer of pollen from one flower to another helps flowers reproduce, and is what makes bats such important pollinators. This is what's called a symbiotic relationship, which is when both organisms benefit.

DID YOU KNOW?

There are three kinds of vampire bats. As their name suggests, these are bats that drink animal blood. They live in Central and South America, as well as in the Amazon Rainforest. One species only feeds on birds, while the others drink blood from sleeping or wounded animals such as wildlife, cattle or horses. They seldom suck it out, but instead they use their tongues to lap it up. They rarely drink human blood, and this has only been reported to occur in the Amazon. In fact, bats generally fear humans and avoid them as much as possible.



ANATOMY OF A BAT

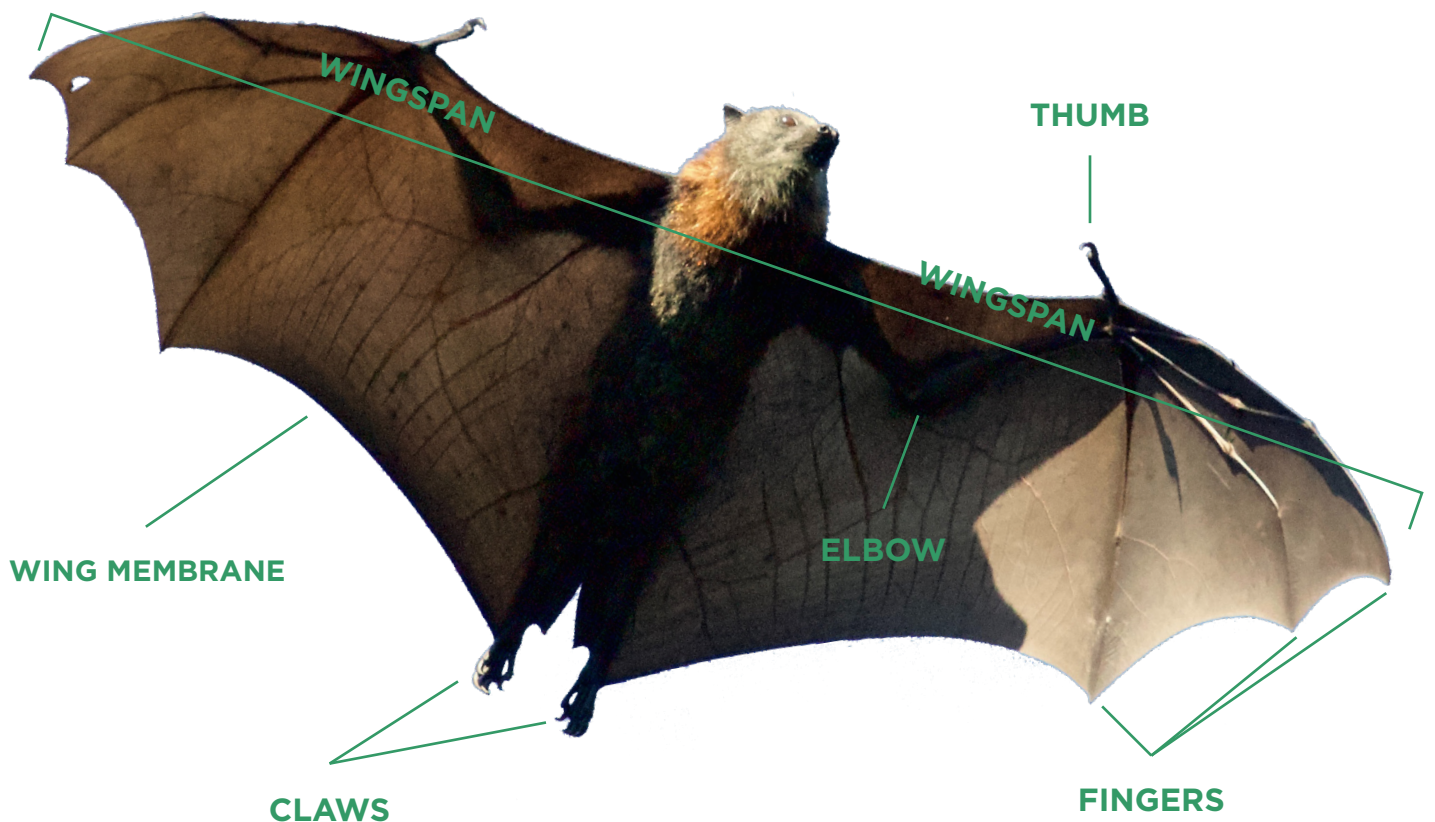


PARTS OF THE BAT

A bat's wings are like its hands, with four long fingers and a thumb. The wing membrane, a thin layer of skin, spreads between each finger. Bats produce high-pitched sounds from their larynx, and some also from their nostrils. These high-frequency sounds bounce off objects in their vicinity, and the bats listen for the

returning echoes. This is a process known as echolocation, and it allows bats to understand their surroundings so that they can hunt food, avoid predators, and, of course, keep from flying into trees or buildings. These sounds are so high-pitched that humans can't hear them. Bats also communicate with each other by clicking their tongues.

SPREAD YOUR WINGS TO FLY!



BAT FACTS



BIGGEST AND SMALLEST

Fruit bats and flying foxes can grow as large as 4 pounds. These are the largest bats in the world, with a wingspan of approximately 6 feet. Bumble bee bats are the smallest in the world, weighing about 2 grams, and they're about the size of your pinkie finger.



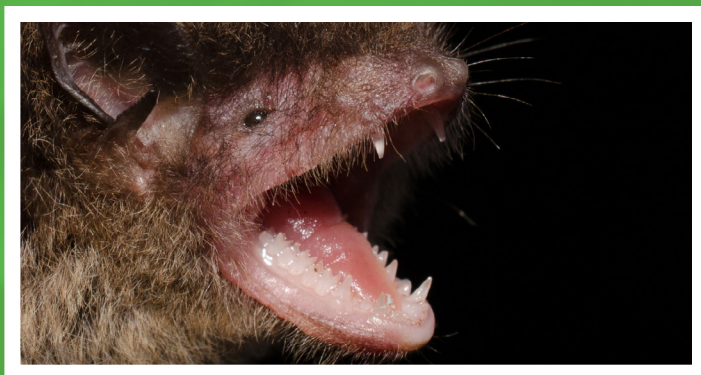
A COLONY OF BATS

Bats usually become active and leave their home, called a roost, to hunt in the evenings. Most bats live in large groups called colonies, or camps, that are in warm places like caves, hollowed trees, barn rafters, or abandoned buildings. These are places that are safe and where bats can avoid humans and predators.



A NURSERY OF BATS

Maternity season for bats – when babies are born – in North America is from April to June, when it is warm and there is an abundance of insects to eat. The female positions herself upward so gravity will help when she gives birth. A newborn bonds with its mother as she licks it clean. As the pups get older, females will leave them huddled upside down in groups with a babysitter in the nursery at night while they go out to feed.



SHARP TEETH

Bats have sharp teeth so they can cut through fruit skin and grind through its pulp. These sharp teeth are also useful for breaking the hard shells of insects. Most bats can eat 50 to 150 percent of their body weight in insects in one night!





MAKE YOUR OWN Bat Mask

ABOUT THE ACTIVITY

Use the template to create a bat mask with any combination of colors you can think of.

MATERIALS

- Bat mask template (Provided)
- Crayons or markers
- Pipe cleaners
- Scissors



STEP 1:

Color your bat mask.



STEP 2:

Cut out your mask.



STEP 3:

Cut out the eyes, and poke small holes under the ears and next to the eyes using a pen.



STEP 4:

Thread a pipe cleaner through one cheek hole; twist one end of the pipe cleaner around the cheek, then fold the other end to fit like eyeglasses over the mask-wearer's ear. Do this on both sides.

STEP 5:

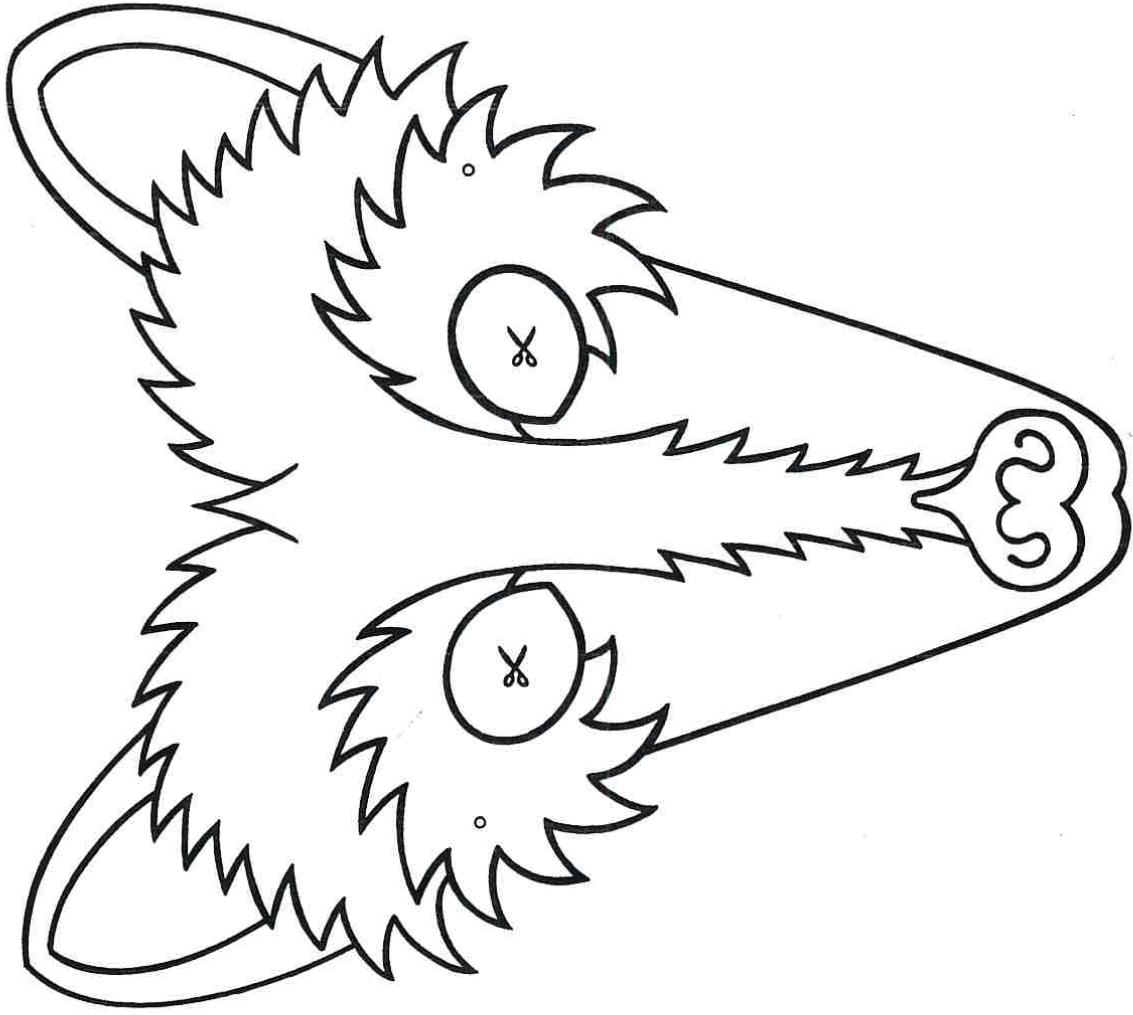
Thread the pipe cleaners through the holes and make a knot at the end, on the colored side.

DID YOU KNOW?

Bats are typically brown or black in color, but may have grey, red, white or orange fur.

Enjoy your mask!



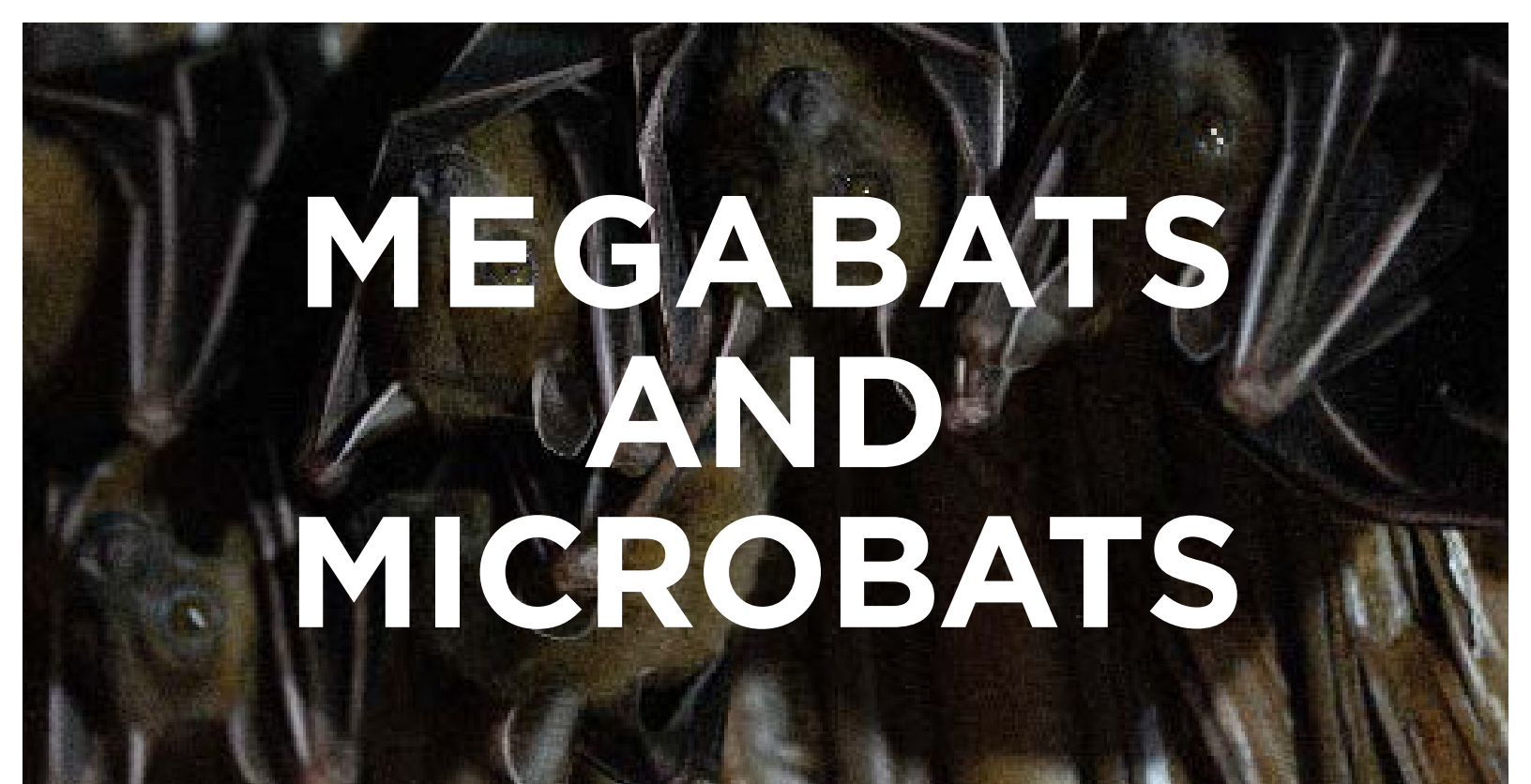


Grey-headed flying-fox
Pteropus poliocephalus

Fun Fact

This megabat is native to Australia and likes to eat fruit. This bat only uses its eyes to find its food - it does not echolocate!

www.batcon.org



MEGABATS AND MICROBATS

CHIROPTERA

The scientific name for all bats is Chiroptera, which means “hand wing.” Bats have small bodies, lightweight bones and big wings. A bat can move its wing by adjusting its fingers and thumb in different ways (similar to how we flex our fingers) enabling a flying bat to quickly change its wing shape, which in turn changes its speed its speed and direction. At night, a bat can put in four hours of airtime flying an average speed of 50 MPH. Bats swoop low through the sky – flying among trees and even close to the ground – to catch flying insects out at night.

DIFFERENT BAT GROUPS

There are two bat groups: megabats (big bats) and microbats (little bats). The major difference between the groups is how they find their food and what they eat. Megabats eat pollen, nectar or fruit. They rely on sight and smell to locate their food. Microbats catch insects and animal prey. They use their hearing and echolocation to find food. Big or little,

all bats have a head, body, two legs, and two wings. They use their clawed feet to hang upside down and sleep during the day.

WHY HANG UPSIDE DOWN?

Bats roost, or perch, upside down because, unlike birds, bats cannot launch their bodies into the air from the ground. That’s because their wings don’t produce enough lift to take off. Plus, hanging upside down in groups is a great way for bats to hide from predators and danger; providing safety in groups.

TEMPERATURE AND WEATHER PROTECTION

Their wings can help them cool off when open, and some bats swim to cool down. Their blood cools while they are flying, but flapping their wings helps to heat them back up. A bat wraps its wings around its body to stay warm when hanging upside down at rest or sleeping during the day. Their wings also make a great raincoat!

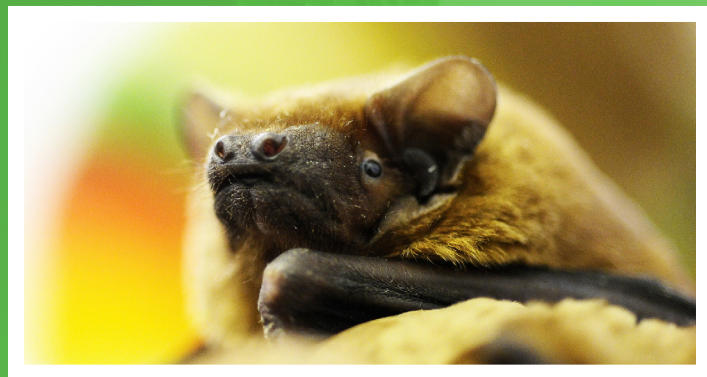
BATS AS POLLINATORS



Bats play a key role in ecosystems around the world. For one, they help to pollinate plants and flowers across the globe, as hundreds of plant species – from the rainforests to the deserts – depend on bats for pollination. They also help humans, especially farmers, by eating insects that can be harmful to produce or livestock.



Bats are essential to keeping our ecosystem healthy, and farmers and ranchers appreciate the work of bats when they eat pesky insects like crop-damaging moths and mosquitoes. It saves them thousands of dollars on pesticides, which aren't healthy to spray on produce, anyway.



Fruit bats eat fruit and quickly digest it, scattering seeds in their guano – aka, bat poop. Scattering those seeds is essential to the growth of not just plants, but of entire forests. Many people fear bats, but they are handy to have around. Just don't touch them – or any wildlife, for that matter. Respect their desire to be left alone, and they will do the same.



Source: www.batcon.org; www.pollinator.org; www.lubee.org; <https://www.youtube.com/watch?v=gr9r6JHNFtM>; <https://www.youtube.com/watch?v=b3w9ZbRQlek>, Water for Wildlife, Daniel A.R. Taylor & Merlin D. Tuttle/Bat Conservation International

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POLLINATORS ISSUE

The Honey Bee



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TO BEE OR NOT TO BEE... YOU WILL BE A BEEKEEPER



That's right folks! You are going to dive deep into the world of bees, and after you do a few fun activities, you'll have the knowledge you need to become a junior beekeeper. Along the way, you will learn so many cool things about bees! Even if you do not own bees (not many of you probably do) you will learn a lot about things about wax, honey, and the biology of bees. There have been many people throughout the ages who have kept bees, including Thomas Jefferson, Leo Tolstoy, actor Henry Fonda, and even Benjamin Franklin (and the fictional character of Sherlock Holmes).

LET'S START

The first thing we need as a beekeeper is to have a honey bee name. You can be creative and write it on a strip of paper that you tape to your shirt like a name tag. Here are some example names: Buzzing Brandon, The Bee Whisperer, Stinging Steve - you get the idea.

“

A SPOONFUL OF HONEY WILL CATCH MORE FLIES THAN A GALLON OF VINEGAR.”

- BENJAMIN FRANKLIN

DID YOU KNOW?

The art of beekeeping has been around for thousands of years. Even the ancient Egyptians had jars of honey. And because honey never gets rotten and bacteria never grows on it, honey is still good even after a very long time. In fact, they found jars of honey from the ancient Egyptians that were still good to eat! Yum.

TOP REASONS TO BE A BEEKEEPER

- Beekeeping means you get to be close to nature.
- Studying bees is studying science.
- Bees are a really vital part of ecosystems around the world.
- Taking care of bees teaches you responsibility.



HONEY BEES ARE IMPORTANT FOR OUR FOOD



THANKS TO BEES, WE HAVE FOOD!

Next time you go to the grocery store, look around. So much food! And all of it was made possible by pollination, which is when pollen is transferred from one flower to another to help the plant grow seeds for reproduction. In fact, honey bees are responsible for a third of the food that we eat. Imagine that! If you divided your food into three equal parts, one of those is thanks to the bees.

BEE KEEPERS ARE IMPORTANT FOR GROWING FOOD

As a beekeeper your role is very important. Beekeepers transport bees for pollination to many different places in the US. They go to California in February for the almond trees, then to Washington in April for the apple orchards, and to Maine in May for the blueberries, and so on.



HONEY BEE BIOLOGY



BEES ARE VERY HAIRY

Being hairy helps bees inadvertently capture pollen from the flowers they land on. Pollen sticks to their hairs, in part because bee hairs have little branches in them – similar to the barbules on bird feathers – and those branches help to snag the pollen.



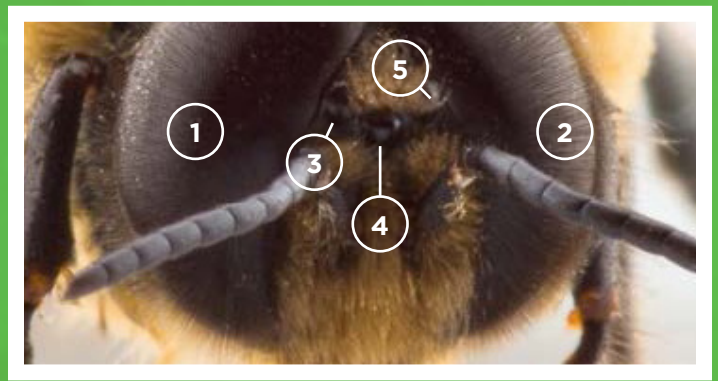
HAIR ON THE EYES

Bees even have hair on their eyeballs. These tiny hairs help them to know the wind direction and how fast they are flying. **Super cool!**



BEES HAVE FIVE EYES

They have two main compound eyes located on the sides of their head made up of thousands of smaller tubes; these eyes are called ommatidia. And they also have three smaller eyes, called ocelli, located on their foreheads.



PROBOSCIS

The proboscis is the tongue of the bee, used like a straw to suck up fluids such as nectar, honey, or water.



MAKE YOUR OWN

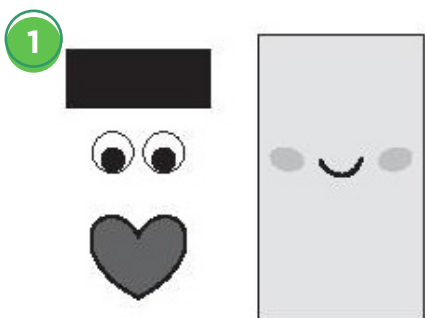
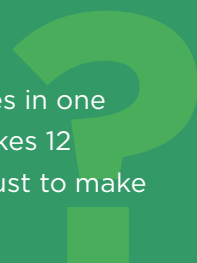
Craft Honey Bee

ABOUT THE ACTIVITY

You will be creating a honey bee using things you can find around your house, including a toilet paper roll, construction paper, pipe cleaners, glue, scissors, markers, and googly eyes, if you have them.

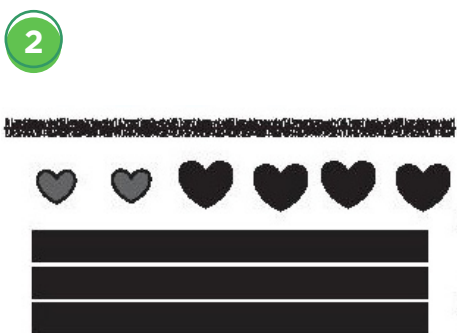
DID YOU KNOW?

There can be over 60,000 bees in one hive? That's a lot of Bees! It takes 12 Honey bees their whole lives just to make 1 teaspoon of honey.



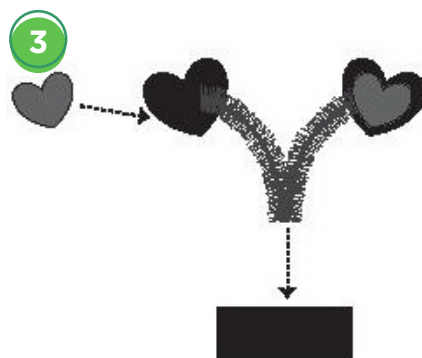
STEP 1:

Tape or glue a strip of yellow construction paper around your toilet paper roll. If you don't have yellow construction paper, you can simply color your roll with a yellow marker. construction paper, use markers to color your paper.



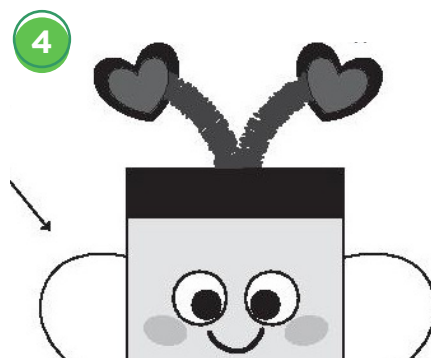
STEP 2:

Using the picture as a guide, trace and then cut out wings, black strips and red hearts (and also slightly larger black hearts); if you don't have black or red construction paper, use markers to color your paper.



STEP 3:

Fold the pipe cleaner in half and glue the black hearts on the ends.



STEP 4:

Using the picture above as your guide, glue on the black strips, eyes, hearts and wings.

Source: <https://www.thoughtco.com/fascinating-facts-about-butterflies-1968171>

THE HONEY TASTE TEST

Honey is one of the foods that the honey bee produces. They store honey in combs for later use. Honey has different flavors depending on the types of flowers that the bees visit. Humans can also add flavors to the honey as well. If possible, the next time you or your parents go to the store, buy small containers of each of the four kinds of honey listed below - orange, buckwheat, wildflower, and clover blossom. Then get ready to taste! As a beekeeper your job is to taste the honey for flavor and quality. For Round 1 you will choose between the first two flavors then choose between the next two and write your favorite in the yellow for Round 2. Then decide your favorite flavor and post in the pink block.



ROUND 1

ROUND 2

FINAL

ORANGE

- VS -

BUCKWHEAT

WILDFLOWER

- VS -

CLOVER BLOSSOM

.....

.....

.....



HONEY BEE FACTS



HONEYCOMB

Honeycomb are hexagonally shaped cells that hold honey and bee larvae. The hexagon is the strongest known shape, so the honeycomb is a very secure place!



WAX GLANDS

The honey bee's abdomen has special glands that secrete wax, which bees use to help them build and repair their comb. This all happens when the bee is in the "house bee" stage.



BEES CAP CELLS

Honey bees also use wax to seal the cells filled with larva or honey. When they are covered they are called capped. Capped cells tells the beekeeper that the honey is ready.



HONEY FROM THE COMB

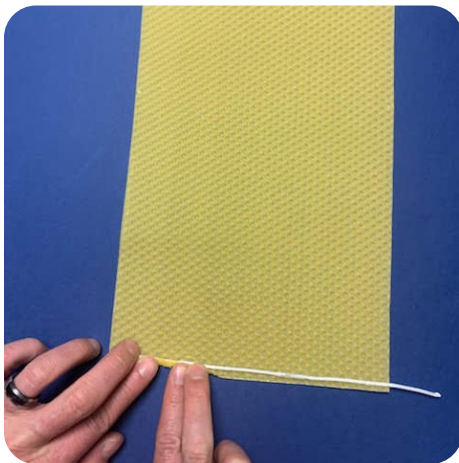
Often beekeepers will sell honey with the wax comb. People will chew on the comb and swallow the honey. **Yum!**

MAKING A

WAX CANDLE

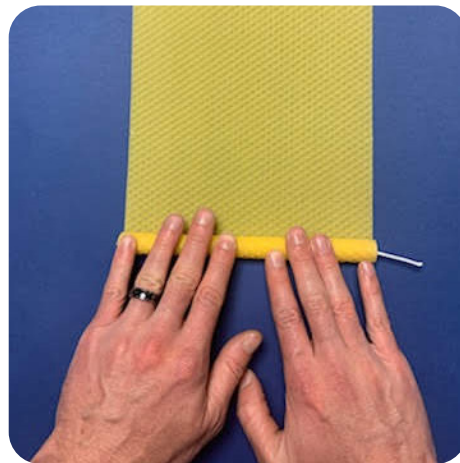
ABOUT THE ACTIVITY

Now that you have learned about how honey bees make wax, now you get to make your own rolled wax candle! You'll need wax sheets and wicks - things that you can usually buy at a grocery store, a craft store, or online. Then, follow these simple steps:



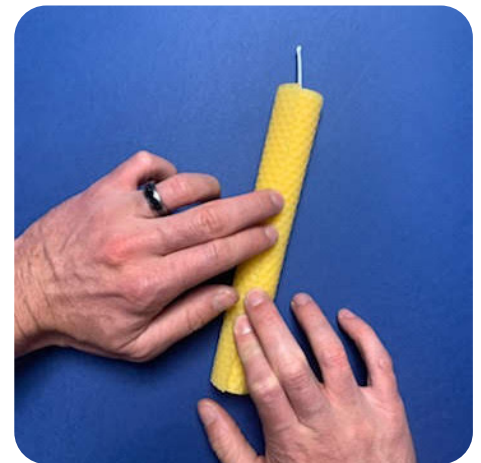
STEP 1:

place the wick along the short edge of the wax sheet. Allow the wick to stick out a few inches. This will be the top of the candle. Then fold the wax over the wick tightly.



STEP 2:

Start rolling the candle tightly so that there is no space between each roll.



STEP 3:

Once it is all rolled, press firmly on the edge of the wax so that it sticks to the rest of the candle.

Source: [The Honey Files A Teaching guide](#), National Honey Board 1, 1409 Business Park Circle, Suite 210 Firestone, CO 80504
www.honey.com, Penn State Extension Beekeeping 101

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POLLINATORS ISSUE

The Butterfly



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BUTTERFLIES ARE IMPORTANT POLLINATORS



Butterflies are fascinating creatures, and are vital to the world's ecology. They're also elusive! Butterflies fly quickly, and constantly change their direction. That's why butterfly catchers use nets to try to capture butterflies, so they can observe them. But even if you can't catch a butterfly, don't worry. Watching one fly in the wild and pollinate a flower is even more exciting.

POLLINATORS

Butterflies, just like honeybees, help pollinate flowers. They have long legs, so less pollen gets on their body than on the stubby-legged bees, but butterflies are still very effective pollinators. In fact, butterflies can travel farther distances than the honey bee, which means that they can pollinate a greater area. Butterflies pollinate during the day while flowers are open. Some pollen gets on the butterfly's legs and some on their bodies.

As they go to another flower of the same species, that pollen gets transferred onto that flower.

“

**A BUTTERFLY LIGHTS BESIDE US, LIKE A
SUNBEAM...”**

– AUTHOR UNKNOWN

DID YOU KNOW?

Butterflies have better color perception than the honey bee and humans. They are able to see the color red, which the honey bee cannot. They also are able to see ultraviolet light which helps them see special markings, called nectar guides, that are located on some types of flowers. Butterflies see very well 10 to 12 feet in front of them, and after that their vision becomes blurry.



A NEW BUTTERFLY EMERGES



GETTING READY TO FLY!

During the pupal phase – the phase after a caterpillar encloses itself in a protective sack – the developing butterfly is inside the chrysalis and undergoes some incredible changes to become a butterfly. The body, legs and wings are being formed during that transformation. When the butterfly comes out into the world, its wings are collapsed and shriveled around its body. The next part is really amazing: The butterfly pumps body fluid through its wing veins which allows them to get bigger. After this, the butterfly will rest for a couple hours to allow everything to dry and harden. Then the butterfly is ready for flight.

TIME TO CONNECT THE MOUTH

What would you think if you had to build one of your body parts when you were first born? Strange? Butterflies have to assemble their mouth parts. When they come out of the chrysalis, their mouths are not fully formed. Using their palpi – two long appendages that are next to their proboscis, they begin to assemble the disconnected mouth pieces into a single tongue. You may see the new butterfly curling and uncurling their proboscis over and over to make sure it works.



BUTTERFLY FACTS



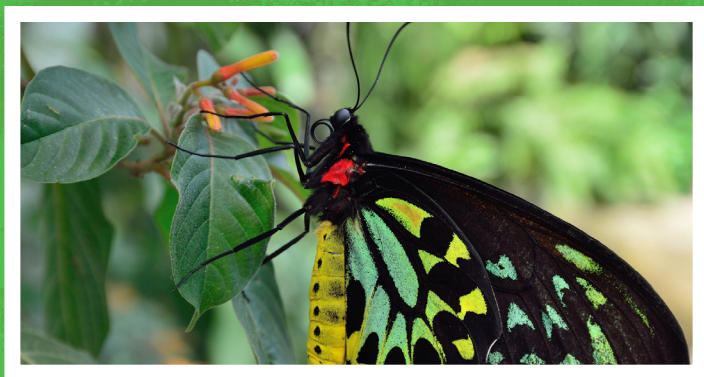
INSIDE A CHRYSALIS

The pupa stage of a moth is called a cocoon, and for the butterfly it is called a chrysalis. This is when the caterpillar stops eating and begins its transformation into a butterfly.



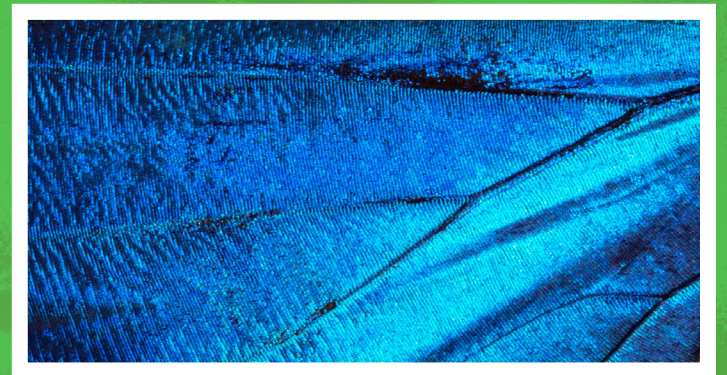
TASTE WITH THEIR FEET

You might think a butterfly would taste with its proboscis, but not so. Butterflies have their taste receptors on their feet! They land on food such as fermenting fruit, and these organs sense the dissolving fruit.



TRANSPARENT WINGS

Butterflies have lots of colors. This is because their wings have tiny scales that reflect light. Underneath these scales the wings are made out of an exoskeleton, called a chitin, which is transparent.



DRINKING NECTAR

The butterfly has a proboscis which slurps up nectar from flowers. As the butterfly drinks, some pollen gets stuck on its hairs. That's how the butterfly inadvertently transfers pollen from one flower to another.

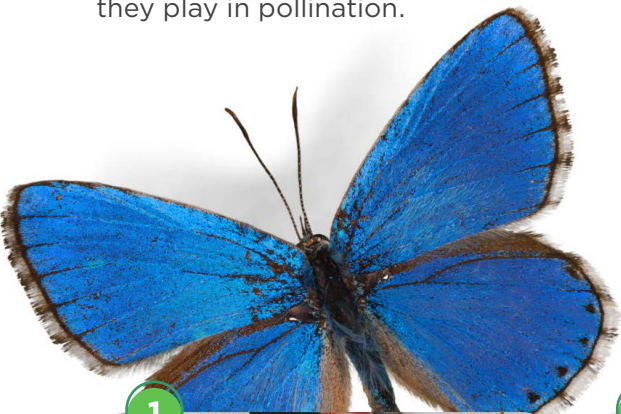


MAKE YOUR OWN

Chromatography Butterflies

ABOUT THE ACTIVITY

Using a coffee filter, food dye and a clothespin, you'll make a fun craft butterfly and learn about the role they play in pollination.



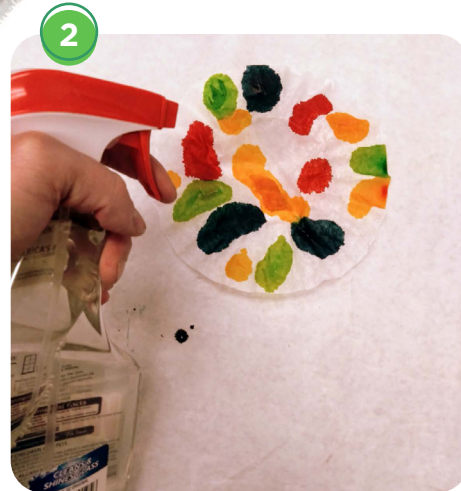
MATERIALS

- Coffee filter
- Food dye or water colored markers
- Spray bottle
- Small clothes pin
- Drop cloth or newspaper to place on the table under the project



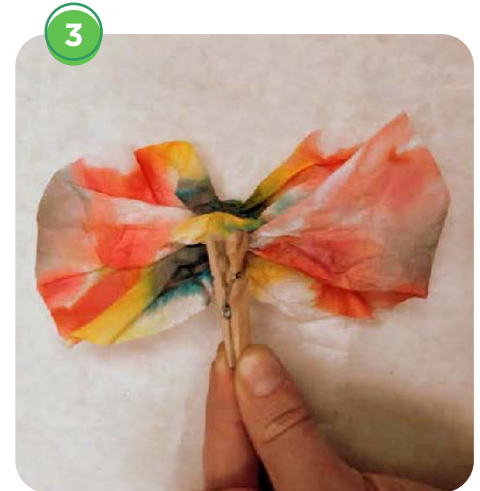
STEP 1:

Squeeze a few drops of each color onto the coffee filter. Keep them spaced out in order to let water bleed them.



STEP 2:

Spray the water using the spray bottle evenly over the filter and colors. Let it dry.



STEP 3:

Scrunch up the coffee filter down the middle and place clothes pin between the two wings of the butterfly.

Source: <https://www.thoughtco.com/fascinating-facts-about-butterflies-1968171>

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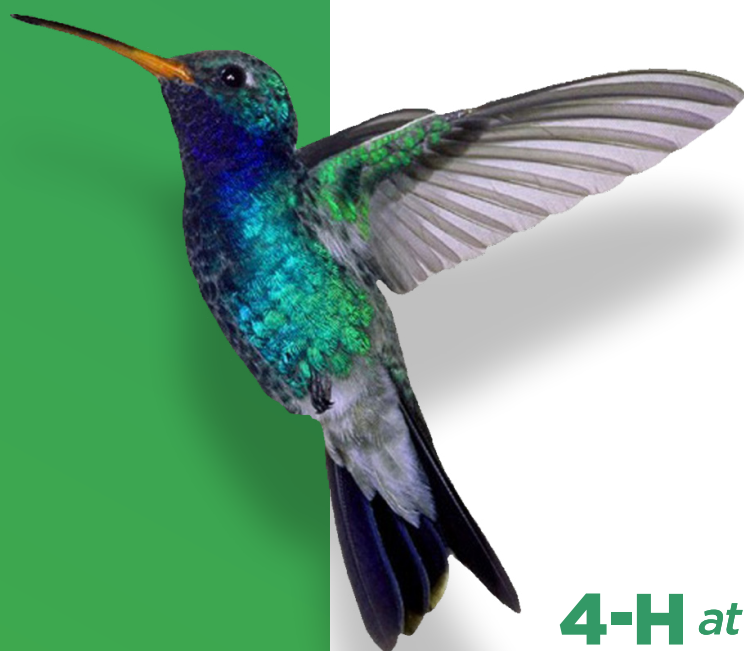
POLLINATORS ISSUE

The Hummingbird



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THESE FAST POLLINATING HUMMERS



FLYING HUMMINGBIRDS

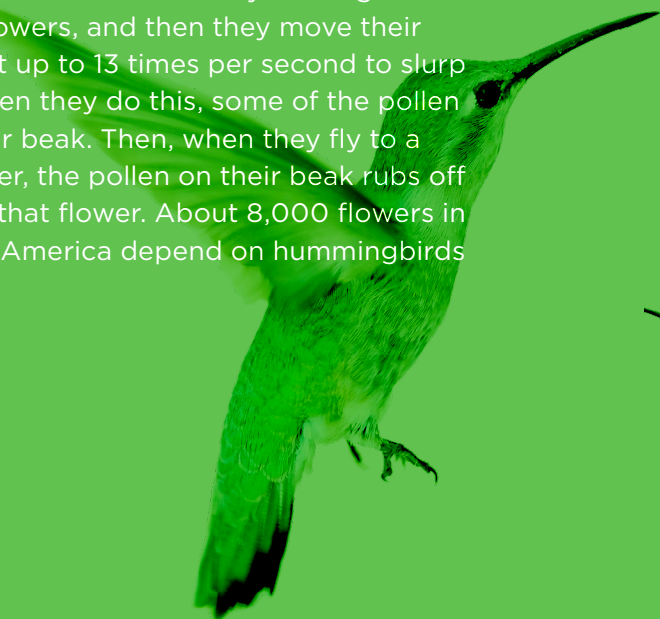
Have you ever heard a hummingbird fly by you? Their wings flap so quickly that they make a humming sound – and that’s where the name hummingbird comes from, and they’re also called hummers. They fly so fast that often all you see is a blur. Hummingbirds flap their wings at incredible speeds: On average, a hummingbird will flap its wings 50 times a second and can even flap as many as 200 times a second – **now that’s fast!** That fast flapping can let a hummingbird fly over 30 MPH.

POLLINATORS

Hummingbirds are pollinators. This means that they help plants reproduce by moving pollen from one flower to another. Hummingbirds love to drink the sweet nectar from the flowers by sticking their thin beaks into flowers, and then they move their tongue in and out up to 13 times per second to slurp up the liquid. When they do this, some of the pollen gets stuck to their beak. Then, when they fly to a neighboring flower, the pollen on their beak rubs off onto the pistil of that flower. About 8,000 flowers in North and South America depend on hummingbirds for pollinating.

DID YOU KNOW?

There are over 340 species of hummingbirds, and they are found only in the Americas. Hummingbirds are the only birds that can fly backward, as well as hover, fly forward – and even upside down! A flock of hummingbirds can be referred to as a bouquet, a glittering, a hover, a shimmer, or a tune.



MIGRATION



MIGRATORY PATTERNS

Here is the migratory path of the ruby-throated hummingbird. Hummingbirds are the smallest bird that migrates, but unlike other birds they don't migrate in flocks. Instead, they migrate by themselves, and they can travel up to 500 miles at a time. Before they migrate they will eat 25-40 percent more food than usual to gather enough energy to sustain themselves through their journey. They visit hundreds of flowers a day and eat as much as their own body weight in nectar. This sweet nectar that fuels the hummingbird's body comes from flowers such as perennials like bee balms, columbines, daylilies, and lupines; biennials such as foxgloves and hollyhocks; and many annuals, including cleomes, impatiens, and petunias.



HUMMINGBIRD FACTS



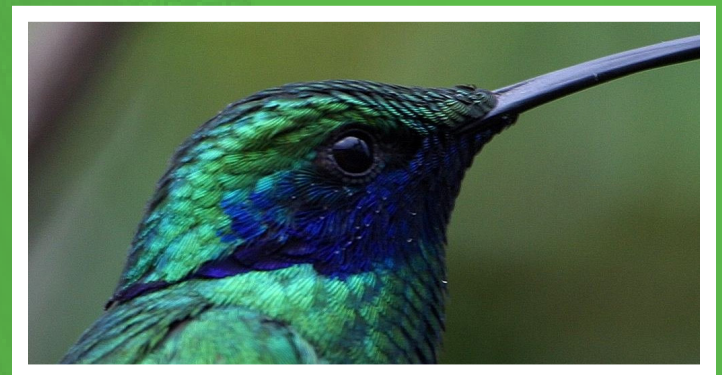
A SMALL NEST

A hummer's nest is smaller than a half-dollar coin. They make their nests out of plant down, spider silk and other natural resources. The female hummer lays an average of two jelly bean-sized eggs per clutch. The average adult hummingbird weighs less than a nickel.



THE BILL

A hummingbird's bill varies between species. Most have long, thin bills that let them reach deep into the flower's pistil to get out the nectar. They open their bill slightly to allow their tongue, which is twice the length of their bill, to lap up that sweet liquid.



CONSERVING ENERGY

A hummingbird uses a lot of energy to fly around. In order to conserve energy, they will perch most of the day on a tree branch and digest their food while observing their surroundings. At night they go into a hibernation-sleep state, called torpor, to save even more energy.



COLORS ATTRACT

While hummingbirds don't have a sense of smell, they do have great vision. They love the colors red, yellow, orange, pink, and other bright colors. They prefer tubular types of flowers where they can insert their long bill inside to get out the nectar.

MAKE YOUR OWN

Hummingbird Feeder



ABOUT THE ACTIVITY

In this activity you will use materials you can find around the house - or at a local hardware or craft store - to make your very own hummingbird feeder.

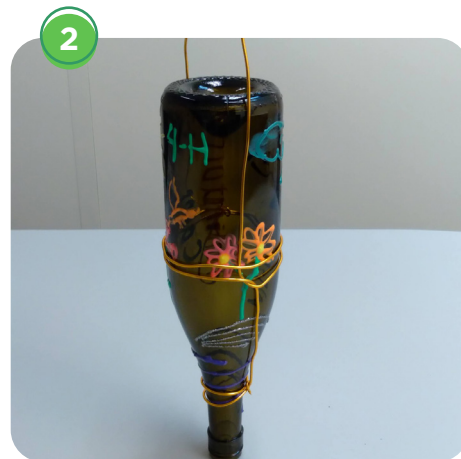
MATERIALS

- Recycled wine bottle—remove label
- Several bright-colored puffy paints
- Cork stopper-sipper
- Decorative wire—12 gauge
- Disposable table covering



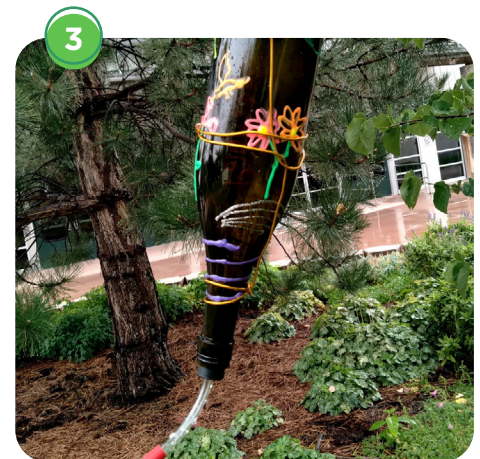
STEP 1:

Prepare a disposable table covering under your project. Stand the bottle nose down, and begin to paint any design you choose. Set aside to dry.



STEP 2:

Wrap the wire twice around the nose of the bottle. Then, move the wire up to the middle of the bottle and make two wraps. Then thread your end through the wraps and then make a loop at the top, then go back down the other side and back to the wraps and tie the wire off.



STEP 3:

Fill the bottle with homemade nectar (recipe on pg. 6). Close with the stopper and hang in a semi-shaded area near bright colored flowers.

Source: <https://www.thoughtco.com/fascinating-facts-about-butterflies-1968171>



HOW TO

Make Nectar

HOW TO ATTRACT HUMMERS

There are many ways to attract hummingbirds to your location. One of the ways is to plant native flowers and plants. Another way is to set up feeders with a sugary nectar to provide them a food source. Try to position your feeders away from potential predators such as snakes, raccoons, and even praying mantises. Position feeders at least 15 feet away from windows to keep hummingbirds from flying into them. Keep them away from the hot afternoon sun to keep the feeder contents from fermenting and getting spoiled. If you plan on having more than one feeder in your yard, keep them out of sight from each other since hummingbirds are territorial.

ACTIVITY STEPS

- Bring 1 cup of water to boil
- Add 1/4 cup of white granulated sugar
- Stir until dissolved
- Boil this mixture for 2 minutes (this will help keep the nectar from spoiling too quickly)
- Set aside to cool
- Pour into a clean hummingbird feeder.

*For larger recipes add 4 parts of water to 1 part of sugar.

i Nectar can be stored for up to two weeks in the fridge.

DO'S and DON'TS

Do not use honey, as this can cause an infection to the hummers and make them sick. Don't use artificial sweeteners, since they have no nutritional value. Avoid red dyes most are unhealthy. Clean your feeder once a week. Dispose of unused nectar.

WATER

Birds love moving water and need a year-round source of fresh water. The ideal depth is 1 to 3 inches for both drinking and bathing. A sloped, shallow water source with rocks and a rough surface to grip onto works best. Be sure to empty and refill this daily.





METABOLISM



METABOLISM

Hummingbirds can fly an average of 25-30 MPH. Besides insects, hummingbirds have the highest metabolism of all animals. This means hummingbirds need to eat a lot in order to maintain their weight.

Their heart rates range from 420 to 1,260 beats per minute! A human's resting heart rate is about 60 to 100 beats per minute. 30 percent of a hummer's weight is located in its flight muscles, while a hummingbird's brain accounts for just over 4 percent of its body weight. This is the largest brain-to-body weight proportion in the entire bird kingdom.



Source: Kaytee.com, The Spruce- Fun Facts About Hummingbirds UC Davis- Hummingbird information All About Birds-Guide www.everythingbirds.com