

Why We Need Pollinators



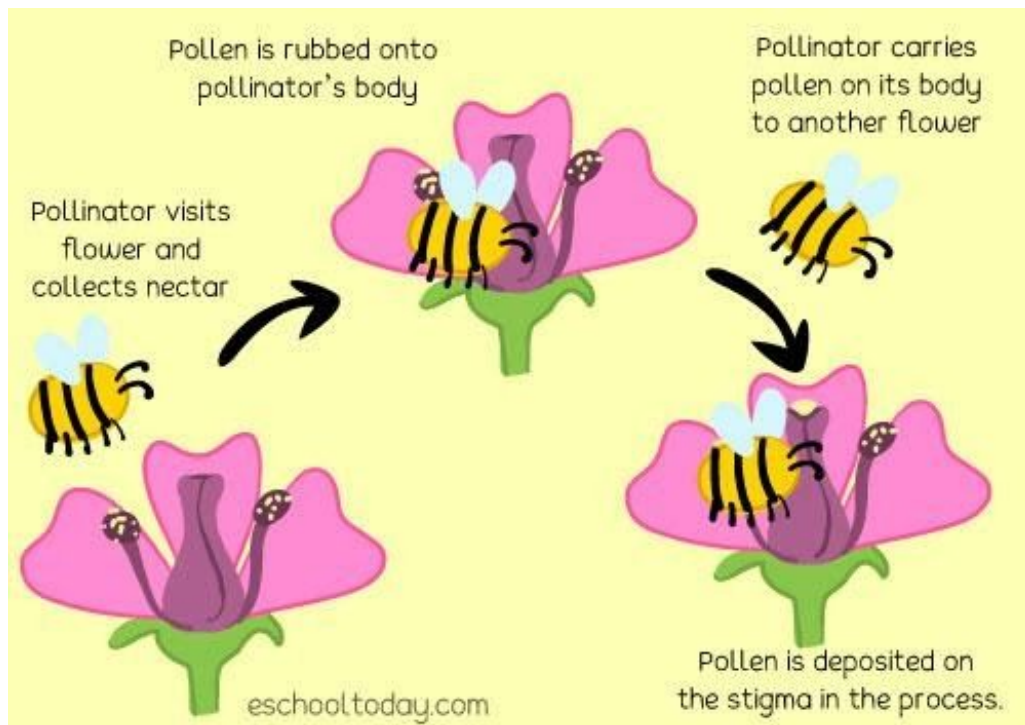
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WHAT IS POLLINATION?



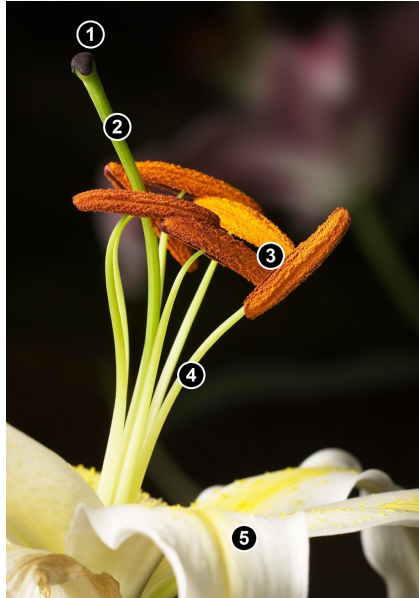
In order for most plants to reproduce and make new plants, they need pollen grains from the male anther in the flower to be carried over to the female stigma also found in the blossoms.

IS THERE MORE THAN ONE KIND OF POLLINATION?

Yes! There are two different types of pollination.

SELF-POLLINATION

Self-pollination occurs in the same flower or plant.



The pollen grains are transferred from the **male anther** to the **female stigma** in the same flower or the same plant.

Number 1 is the **female stigma** which receives the pollen.

Number 2 is the **male anther** which contains the pollen.

Winds play important roles in self-pollination. Apricots, bananas, barley, beets, chard, coconuts, corn, millet, oats, pecans, pistachios, potatoes, rice, rye, spinach tomatoes, walnuts, and wheat do not need pollinators like bees, as they are mostly pollinated by the wind.

CROSS-POLLINATION

In cross pollination, the pollen grains are transferred from the **female anther** of one plant to the **male stigma** of other plants. Cross pollination is very important as most of our flowering plants and most of our food crops need animals to pollinate the flowers.

WHO ARE THE POLLINATING AGENTS?



Animals, birds, insects and wind that transfer the pollen grain from flower to flower are called **pollinating agents**.

Most pollinators are tiny.
But their importance is mighty!

Their job is to pollinate over 450, 000 species of plants!
Do you love to eat sunflower seeds, apples, oranges, bananas, mangos, strawberries, almonds, and chocolate?

M-m-m-m chocolates are my favourite.

Did you know that chocolate is a vegetable?

So next time your mom tells you to eat more veggies, tell her "Give me more chocolate, please!".

Guess what?

Without pollinators there are dozens and dozens of your favourite fruits and veggies that you would never, ever be able to enjoy again.

For dessert, do you like vanilla ice cream topped with sweet strawberries and beautiful blueberries dripping with maple syrup?

My mouth is watering for a bowl right now! Yum! Yum!

I hate to break the news to you, but ... if our pollinators disappear you will no longer be able to eat your favourite dessert.

Cacao plants give us chocolate - my favourite.

Would you believe there is only one pollinator in all the 195 countries of the world that is able to pollinate cacao plants?

The flowers on cacao plants are very tiny.

A very tiny fly called a **midge** is the only insect small enough to climb inside the small white flowers of cacao plants.

So you can see, even the tiniest insect plays a very important role in the web of life.

TYPES OF POLLINATORS

1. INSECTS

Honey Bees

Most of the flowers (90%) in the world are pollinated by insects such as bees, beetles, moths and flies.

Honey bees fly from flower to flower collecting nectar which they turn into honey.

The pollen grains from the flowers attach themselves to the honey bees' hind legs. This is called a "pollen basket".

Do you like apples?

People from over 100 countries love apples!

People report they absolutely love the sweet taste of juicy apples.

You can make applesauce, apple pie, apple tarts, apple strudels, apple jam, and much more from apples.

There would be no apples grown anywhere in the world if our pollinators disappeared!

Honey bees pollinate most apple orchards.

The owners of the apple orchards pay beekeepers to rent their hives.

After thousands of bees pollinate the apple blossoms, they turn into sweet, juicy apples.



Squash Bee

Did you know that if a tiny unimportant-looking bee called a squash bee disappeared, so will all the pumpkins in the whole world?

Squash bees are the only insects that will visit the flowers of pumpkins!

So thank the tiny squash bee next time you have fun carving a Jack O' Lantern!

Bumble Bees



Why do blueberries need pollinators?

Blueberry blossoms are bell shaped with deep throats.

Bumblebees are master pollinators!

Their tongues are nice and long.

Bumblebees have no problems reaching the nectar at the base of a blueberry blossom.

Their bodies are fat and furry!

Pollen easily gets stuck on their furry bodies.

Do you know what else makes them the best pollinators?

Honey bees stay put in their hives if it's cloudy and rainy.

Bumble bees make honey bees look wimpy!

They will venture out in search of sweet nectar even on rainy days.

There is more!

When a bumble bee sits on a flower sucking up sweet nectar, it will vibrate its wings very quickly.

Well, the vibrating wings of bumble bees help to spread the pollen on tomato plants and others.

Bumble bees eat pollen and sweet nectar - sounds delicious right?

However, the first meal they ever eat does not sound delicious.

Can you guess why? Along with sweet nectar and pollen, they also eat the poop of other bumblebees! The poop actually protects them from getting harmful parasites.

Scientists carrying out research on bumble bees just about fell off their chairs! Why?

They discovered (2020) that bumble bees make tiny incisions in the leaves of flowering plants.

Believe it or not, those tiny incisions force the flower to bloom earlier.

Bees need flowers to bloom so they can eat.

Early blooming is really important to bumble bees so they have pollen readily available when they need it.

So bumble bees can actually do something important that scientists have never been able to accomplish.

Mosquitoes

When you think of a mosquito you probably think of a pesky insect that will bite you and suck your blood! Right!?



Actually the only mosquito that will suck your blood is a female mosquito.

And she only wants blood when she is ready to lay eggs.

Mosquitoes' favourite food is actually not your blood, but it's insanely sweet nectar.

Mosquitoes flock to orchids growing out of the branches of trees in tropical countries.

Do you like vanilla ice cream?

Guess what?

Vanilla comes from orchids.

So next time you enjoy vanilla ice cream , thank a pesky mosquito!

Beetles

Unlike bees, when beetles are found on flowers they are not in search of nectar, but they are looking for pollen.

Some beetles that are good at pollination are called soldier, jewel, blister, and sap beetles.

Beetles pollinate flowers quite differently from other pollinators.

It is kind of gross! Are you ready? Here it goes...

First, they eat parts of the flower.

Then they poop inside the flower.

Finally, they roll around in the poopy pollen.



Some flowers that are pollinated by beetles are called goldenrod, magnolias and pond lilies.

2. BIRDS

Hummingbirds

Hummingbirds are not only dazzling, but they are a very special kind of pollinator!

Due to their long beaks they are able to pollinate blossoms that no other pollinator can!

Why? Some flowers have very deep throats.

The throats are so deep that bees and other pollinating insects simply cannot reach the nectar.

How do hummingbirds actually transfer pollen?

The tiny pollen grains stick to their long sword-like beaks or their tiny foreheads.

Have you ever seen a hummingbird walk?

Their feet are too tiny for walking.

That is good news for flowers!

Hummingbirds cause no damage to flowers, as they just hover like a helicopter, while they gently slip their beaks into deep-throated flowers.

Hummingbirds are multi-talented.

If they could participate in the Olympics, they would be awarded gold for their acrobatic-flying skills.

They cannot only fly forwards, but they can also fly backwards, sideways, and straight up in the air.

Pretty astounding, right?

But, wait there is more.



As they dart from flower to flower searching for nectar and insects, they can actually do backwards somersaults! So, even hummingbirds like to have fun.

If that is not enough expertise for one bird, they possess even more record breaking skills!

These tiny “flying jewels” can fly up to 95 kilometres per hour!

That would be speeding on many highways!

They can flap their wings up to 200 flaps per second!

How many times can you wave your hands in one second?

The ruby-throated hummingbird will fly all by its lonesome, over 4,000 kilometres from Ontario to Costa Rica, without stopping for a rest or to eat!

How far can you walk without resting and eating?

What makes this journey ever more incredible is the fact that hummingbirds do not fly over land, but instead fly over 4,000 km for about 20 hours non-stop over a body of water called the Gulf of Mexico!

Just because hummingbirds are the tiniest of all bird species, do not believe for a single second that they are weak and helpless.

Believe it or not, if another bird invades hummingbird territory, these tiny “flying jewels” will readily attack blue jays, crows, and even sharp-beaked hawks.

What do you call a flock of hummingbirds?

A shimmer! What a beautiful word!

3. VERTEBRATES

Some flowering plants are pollinated by kinkajous, monkeys, lemurs, possums, lizards and even rodents like rats.

The honey possum is a tiny marsupial who feeds on the nectar of all kinds of flowering plants in Australia.



honey possum

When the ruffed lemurs of Madagascar reach into the flowers of the traveler's palm tree, they get pollen all over their snouts.



ruffed lemur

Rats like the nectar of flowers and as they go from flower to flower they help with pollination.

While the daytime pollinators sleep, nocturnal pollinators will pollinate flowers all night long.

Who are the night-time pollinators you might ask?

Fruit bats pollinate plants that flower at night time. Would you believe that there are over 300 different food producing plants that need fruit bats to pollinate them?



fruit bat

Do you like bananas, mangos, dates and cashew nuts?

They all need fruit bats to pollinate them!

Moths also pollinate flowers at night.

Night moths will pollinate moonflowers, evening primrose, nicotiana and morning glories.

4. HUMANS

Even humans can actually help pollinate flowers.

If you shake a tomato plant, you can help with self-pollination.

Or you can get a cotton swab to collect pollen and move it to another flower.



ACTIVITY PAGES



True or False

1. Even a tiger can help pollinate flowers. **T or F**
2. Pollinating agents transfer pollen grains from flower to flower. **T or F**
3. A midge is the only insect that will pollinate the flowers of orange trees. **T or F**
4. If there were no fruit bats you would not be able to eat bananas. **T or F**
5. Some honey bees are nighttime pollinators. **T or F**
6. Hummingbirds are really great at pollinating deep- throated flowers. **T or F**
7. If tiny midges disappear, we would not be able to eat real chocolate. **T or F**
8. Humans can actually pollinate flowers. **T or F**
9. Even rats can be pollinating agents. **T or F**
10. The best pollinating agents are dogs. **T or F**

Draw 3 of your favourite pollinators and label each one.



Draw your favourite pollinator. Colour it. Label it.

Find and circle the names of 2 pollinators in each line.



1. emnmidgescxzkbutterfliestraradbutreflysklpmig
2. hratsaneyboeplhoneybeesdshpyghaneyberats
3. mophijklsgmosquitoesmathsbvcdhpnomothespkj
4. Frulkhfruitbadsmhumanslghbadsgkhkzxfruitbatsdm
5. plkmnjhbridsmklpwebirdsmbnjhbumblebeesbnlkd

Cross out all the animals that are not pollinators.
There are ten.

cows	honey bees	<i>moths</i>	cats
<i>lizards</i>	flies		horses
moths	rats		spiders
snakes			lemurs
midges	dolphins	fruit bats	beetles
fish	frogs		turtles
dogs	hummingbirds		fruit bats
turkeys	monkeys		butterflies

Riddles



- ❖ I am a pollinator.
Without me you would not be able to eat chocolate.
-

- ❖ I am a pollinator.
I have a long beak.
I am a great flyer, but I cannot walk.
-

- ❖ I am a pollinator.
I am the only insect that can pollinate Brazil nuts.
-

- ❖ I am a pollinator.
I am the only mammal that can fly.
I pollinate bananas.
-

- ❖ I am a pollinator.
I pollinate more flowers than any other pollinator.
I collect nectar which I turn into honey.
-

- ❖ I am a pollinator.
I am an insect.
I pollinate flowers at night time.
-

Colour all the pollinators red. Colour the flowers yellow. Colour non-pollinators blue.



honey bees	cats	cacao flowers
dogs	moths	tigers
apple blossoms	squirrels	fruit bats
deer	orange blossom	foxes
hummingbirds	wolves	sunflowers

Choose the correct word.

- Hummingbirds are great pollinating agents for
(deep-throated) (colourful)
_____ flowers.
- Honey bees fly from flower to flower collecting
_____ (nectar) (pollen) which they turn into
honey.
- People from over (1000) (100) countries eat apples!
- (Bumble bees) (Honey bees)
_____ will venture outside even
when it's rainy!
- A very tiny fly called a (moth) (midge)
_____ is the only insect small enough to
climb inside the small white flowers of cacao plants.

Interview a Pollinator

Pretend you are a news reporter. List 5 questions you would ask a hummingbird or another one of your favourite pollinators.



1. _____

2. _____

3. _____

4. _____

5. _____

Now answer your favourite question.

Draw a hummingbird. Label its body parts.



A large empty rectangular box for drawing a hummingbird and labeling its body parts.

Pollinator Math

Figure out the math problem, then draw the correct answers.

20 - 10 midges 18 - 12 honey bees

16 - 13 moths 14 - 12 hummingbirds

A large empty rectangular box for drawing the correct answers to the math problems.

Write in the missing words. Use the word bank to help.

Hummingbirds are not only dazzling but they are a very special kind of _____.

They are able to pollinate blossoms that no other pollinators can!

Why? Some flowers have very deep_____.

The throats are so deep that bees and other pollinating insects simply cannot reach the _____.

How do hummingbirds actually transfer pollen?

The tiny pollen grains stick to their long sword-like beaks or their tiny and very adorable _____.

Hummingbirds never damage flowers like lemurs and possums might.

Have you ever seen a hummingbird walk?

Their feet are too tiny for _____.

That is good news for flowers!

They cause no damage to flowers as they just hover like a helicopter while they gently slip their beaks into deep-throated _____.

However, they have a special talent.

If they could participate in the Olympics, they would be awarded gold for their acrobatic flying skills.

They can not only fly forwards but they can also fly _____, sideways and straight up in the air.

throats	flowers	foreheads
backwards	pollen	walking

UnScramble the names of the pollinators. The first one was done for you.

btlfruye	<i>butterfly</i>	mhot	
rmelu		tar	
dribgnimumh		musosp	

Design a perfect pollinator. Give it a name. Label its body parts.





HOW CAN I HELP POLLINATORS IN MY NEIGHBOURHOOD?

- ☐ Ask your parents to create a 'Pollinator Patch' in your garden.

Check the chart below for some native plants that attract pollinators.

<input type="checkbox"/> bee balm	<input type="checkbox"/> black-eyed susan	<input type="checkbox"/> common milkweed
<input type="checkbox"/> coneflower	<input type="checkbox"/> wild bergamot	<input type="checkbox"/> butterfly weed
<input type="checkbox"/> turtlehead	<input type="checkbox"/> ironweed	<input type="checkbox"/> cup plant

- ☐ When you spy a moth, butterfly, bee or hummingbird flitting from flower to flower say, "Thank-you!"
- ☐ If you suddenly see a milkweed growing in your garden DO NOT PULL IT OUT! Why, you might ask? Monarch butterflies lay their eggs on milkweed leaves.

The Monarch caterpillars are only able to eat milkweed leaves – no more milkweed plants mean no more Monarch butterflies!

- Place a butterfly townhouse or cedar bee house in your backyard.



- Take part in a '*Bumble Bee Watch*' and record how many bumblebees you find.
- Ask your parents not to use pesticides on flowers as they will not only kill pests, but they also kill our precious pollinators.

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