

**Genre** Informational Text

**Essential Questions**

Why is the natural world important to our survival?  
Why is it important to protect nature? What could happen if it is not protected?

# WHAT'S

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# THE

# BUZZ?

KEEPING BEES IN FLIGHT



Early one summer morning a few years ago, I loaded my first beehive into the back of my car near where I live in Victoria, British Columbia. John, the beekeeper who sold it to me, had plugged the entrance, but a few bees that had already left the hive were now coming back with pollen and nectar and trying to get into their home. I got the giggles as I drove home with a car full of honey bees—several thousand of them safely inside the hive, but quite a few that were flying around in the car!

John and I carried the hive to a sunny spot in the garden and opened up the entrance. He gave me a beekeeper's veil to protect my head, leather gloves for my hands, and a hive tool to use for moving things around in the hive. Then he took off the lid and gave me my first lesson in beekeeping. After that, I was on my own.

Many mistakes and only a few stings later, I now have six hives. And I have learned so much—not just about honey bees, but also about all the wild bees that live with us and how much we depend on them. I've also learned how human activities have harmed them, and how badly they now need our help to survive.

This selection will take you into the busy world of bees. You don't need a veil or gloves to be amazed—just come with me!

## ALL ABUZZ

When I was growing up in Ontario, we always had clover honey in early summer. It was pale and clear, with a mild flavor, and sometimes we got it right in the wax honeycomb, to chew like candy. In the fall, we had buckwheat honey, almost black and very strong tasting, and especially good on pumpkin pie at Thanksgiving! Later, when I started traveling, I noticed that honey from different places looked and tasted different. That's because the color and taste of the honey depend on the flowers that the bees have visited, and every place has different kinds of plants.



*These jars of honey taste as different as they look.*



*Most plants need pollinators like bees to carry pollen from one flower to another so they can create seeds and fruit.*

## **Bees at Work**

### **POLLINATION POWER**

Bees have a very important job in both nature and agriculture: pollinating plants. Most plants, including many of the plants that we humans use for food, need to have their pollen moved from plant to plant in order to reproduce.

Flowering plants have both male and female parts. The male part of a flower (the *stamen*) produces *pollen*, a fine powder that contains the plant's genetic information, or DNA. When the pollen is moved from the stamen on one plant to the female part of a flower (the *pistil*) on another plant of the same kind, that plant will make seeds and fruit. This is called *pollination*. Since plants are rooted to the spot, they need some way to move the pollen from plant to plant.

Some plants, like many grasses and *conifers* (trees with needles and cones), count on the wind to move their pollen. But most rely on animals to carry the pollen from flower to flower. Flies, beetles, butterflies, moths, hummingbirds, bats and even lemurs move pollen, but bees do it best.

Animals that pollinate plants are called *pollinators*. But pollinators don't pollinate plants on purpose. They visit plants for other reasons.

Often they are looking for food, both for themselves and their offspring. Pollen provides protein and other important nutrients for bees. Plants also produce *nectar*, a sweet liquid that attracts pollinators, who use it for energy.

Some pollinators visit flowers to find a mate, while others visit to gather oils from the flower to make perfume that will help them attract a mate.

Whatever their reason for visiting the flowers, bees get grains of pollen stuck to their body. When they visit the next flower, some of the grains of pollen rub off—pollination accomplished!



### **BEE FACT:**

Some flowers need to be vibrated to release their pollen. Bumble bees and several other wild bees do this by holding on to the flower and vibrating their flight muscles without flapping their wings. Since the vibration makes a buzzing sound, this is called *buzz pollination*.



*If you see a really big bumble bee in early spring, it is probably a queen searching for food for herself and her young.*



### VERY HAIRY

What makes bees such good pollinators?

Apart from a few wasp species, it is only bees that deliberately gather pollen to take back to their nests and feed to their young. As well, bees will visit only one kind of plant on a foraging trip. A female bee may visit hundreds of flowers of the same type on a single trip, transferring pollen along the way. If you watch bees in a garden, you will never see them going from, say, a dandelion to a daisy.

### BEE FACT:



A worker honey bee's wings beat more than 400 times per second. This is what makes bees buzz, but it also allows them to fly fast—up to 30 kilometers per hour (19 miles per hour)—even when they are fully loaded with nectar or pollen.

And then there is the hair. As bees evolved from their smoother ancestors, the wasps, they developed special branched hairs just for holding pollen. Pollen grains are sticky or oily, and some even have little spikes on them, to help them stick to the feathery hairs on the bee.

Believe it or not, the pollen grains also have a slight electric charge (negative), and bees develop the opposite charge (positive) while they are flying. The positive and negative charges attract, like magnets, and help the pollen stick to the bees as they fly.

The next time you see a bee on a flower, look closely. You will probably see yellow dust on it: that is the pollen, and you'll know that the bee is doing her important work.

## WE NEED BEES

Many of the foods we eat come from plants that are pollinated by bees, including fruits, vegetables, nuts and seeds. Without bees, for example, we would have no apples, squash, almonds or sunflower seeds. In Canada and the United States, farmers grow more than 100 crop plants that rely on pollinators. Around the world, that number grows to more than 400. In fact, about every third bite of the food we eat and drink every day is from plants that need a pollinator. Can you imagine what would happen if the bees didn't do their work?

It wasn't until the twentieth century that people began to understand the role of pollinators in agriculture and find ways to put them to work. Until quite recently, the only pollinators that could be "managed" by people and kept in moveable hives were honey bees and some of the stingless bees. As many small family farms became bigger farms, and big farms began to give way to even larger "industrial" agriculture operations, farmers began to pay beekeepers to bring their honey bee hives to the farm so the bees could pollinate their crops.

Today, millions of honey bee hives are loaded onto large trucks and moved from crop to crop, sometimes thousands of kilometers (or miles) across North America. They pollinate the blossoms on apple trees, almond trees, blueberry bushes and many other important crops worth billions of dollars per year.

*A beekeeper examines the frame of a honeycomb while surrounded by hundreds of buzzing bees.*



## Native Bees

But honey bees are having problems. The unhealthy lifestyle that *industrial agriculture* creates for them, along with *pesticides* (poisons used to kill insects and weeds) and some nasty pests and diseases, are killing honey bees at a worrying rate.

Fortunately, honey bees aren't the only bees that can be used for pollinating food crops. In fact, other bees can often do the job better than honey bees can. Of the 100 or so crops pollinated by bees in North America, only about fifteen are pollinated only by honey bees. The rest are pollinated by wild bees and other animals. Farmers around the world are finding new ways to use bees other than honey bees to pollinate their crops.

### BEE FACT



Many bees are called *generalists*, because they can easily collect pollen and nectar from lots of different kinds of plants. But some bees are *specialists*, because they can only get their food from specific types of flowers.

### ALL ABUZZ



*Doesn't this pollen look like candy?*

One of the things I love about looking inside a hive is seeing all the colors of pollen that the bees have brought home. A lot of pollen is yellow or orange, but some plants have other colors. My friend Shirley, who helps me with my bees, studied the pollen to find out which colors come from which plants. So now when I see dark red pollen in spring, I know it's from the flowers on the chestnut trees down the hill. Emerald green is from tulips. And the almost-black pollen that the bees bring later in the summer is from fireweed.

The first time this was done was in 1885. There were no native bees in New Zealand that would pollinate clover, a plant that is used to feed cattle and sheep. So four bumble bee species were introduced from England. The experiment was a success: today New Zealand has a lot of cows and sheep, all happily eating clover, thanks to the bumble bees!

Sometimes native bees can be used where they are, without creating artificial homes to move them around in. For example, because squash and pumpkins are native to the Americas, there are native bees that pollinate them. You guessed it: they're called squash bees! Most of the squash and pumpkins that people grow in their own gardens are pollinated by these native bees. And even farmers who grow large amounts of these crops may not need any help from honey bees.

Other kinds of bees will nest in artificial homes that people set up where the bees are needed. For example, an important native bee that is being used in agriculture in different parts of the world is the mason bee. Lots of gardeners where I live are using the blue orchard mason bee for pollination. They provide homes for the bees made from paper tubes or drilled wood or plastic, and store them safely over the winter in a wooden box in a cool, dry place.

North American farmers are using the blue orchard mason bee to pollinate almonds, apples, cherries, pears and plums. In Japan, farmers have been using the native horn-faced mason bee for apple pollination for more than fifty years, and it is now being used in China, Korea and the United States.

Scientists are working hard to learn more about other bees that can be used for pollination, as the honey bee and even many wild bees struggle to survive.



*New Zealand has 3 million people and 60 million sheep—all because of some bumble bees brought from England to pollinate clover.*



*Can you believe this giant pumpkin grew from one small flower that was pollinated by one very small squash bee?*





## Animals Need Bees, Too

Humans aren't the only creatures who depend on bees for the food we eat. All flowering plants, not just food crops, need to be pollinated. That means that plants in nature rely on bees in order to continue to exist—as do the birds and mammals that rely on those plants for food.

About a quarter of all birds eat the fruits and seeds of plants that are pollinated by bees and other animals. In late summer, even a grizzly bear's diet may consist of almost two-thirds fruit!

All of the living things that depend on each other in some way—from tiny bacteria in soil and water to huge grizzly bears—form an intricate web called an *ecosystem*. Sometimes an entire ecosystem can depend on bees. For example, some plants help to prevent stream and river banks from eroding, keeping the water clean for fish and other things that live there. And those plants depend on pollinators.

If a type of plant can't grow anymore, perhaps because something in the environment has changed, scientists need to understand and take care of the plant's pollinators as well in order to find ways to save the plant.



*Even grizzly bears depend on bees, which pollinate the fruits and berries that make up much of its late-summer diet.*

### ALL ABUZZ

One fall day after my first year of beekeeping, a man came to our door. He was carrying a paper bag full of beautiful apples, which he handed to me. He explained that he lived nearby and had heard that I was keeping honey bees. His neighbor's apple tree had produced a large crop of apples for the first time. They were sure it was because the honey bees had pollinated the apple blossoms in the spring, so they wanted to thank me. I'm sure they were the best apples I've ever tasted!



*Bees pollinating apple blossoms in the spring mean lovely apples in the fall*

You will answer the comprehension questions on these pages as a class.

### Did You Know?

The color of honey depends on the floral nectars that go into it. For the most part, darker honeys are stronger in flavor and higher in healthy antioxidants than lighter honeys.

## Text Connections

1. What does John the beekeeper give to the narrator as protection from bees?
2. What part of a plant produces pollen? What role do bees play in plant reproduction?
3. "Why Is the World Green?" explained how top predators keep ecosystems healthy and balanced. Track the bees' role in the food web, and use it to describe the benefit bees grant to top predators.
4. Describe how humans use bees for their own purposes. Based on "Midnight Forests," how do you think Gifford Pinchot might feel about the use of bees as a resource?
5. Think of foods you eat. Which grow because of bees? How might your life be interrupted if you could no longer eat those foods?



## Write

Write about what people can do to encourage pollination and protect bees. For example, what can we plant in our yards or gardens? What kinds of pesticides and lawn care products can we use?

## Look Closer

### Keys to Comprehension

1. What human activities threaten bees? What can we do to help bee populations thrive? Quote details from the text to support your answer.
2. One main idea in “What’s the Buzz?” is that bees make good pollinators. Identify the key details in the text that support this idea.

### Writer’s Craft

3. Read the following sentence from the selection: “A female bee may visit hundreds of flowers of the same type on a single trip, transferring pollen along the way.” Based on what you know about bees and pollination, what does *transferring* mean?

### Concept Development

4. Make an inference about the author’s purpose for writing this selection. Identify reasons and evidence the author uses to support her purpose.





Read this Science Connection. You will answer the questions as a class.

## Text Feature

Parentheses give clarifying information about a topic that is not addressed in the body text.

## Save the Bees

Over the past seventy-five years, honeybee colonies have lost approximately half their numbers. Researchers have identified many reasons for this decrease, but they have yet to find a permanent solution to the problem.

Bees are negatively affected by many things, but often the decline of a hive is not completely understood. Colony Collapse Disorder (CCD) is the name given to a condition affecting hives. When a hive is affected by this disorder, the worker bees depart suddenly, leaving behind the queen bee and any immature offspring. Scientists have not identified a cause or causes for this collapse, but contributing factors to CCD are thought to be disease, parasites, and pesticide exposure.

So what can we do to help save the bees?

First, we can plant a variety of flowers. Different colors and shapes will attract different pollinators. We can also choose plants that bloom in different seasons so that bees have a source of nectar and pollen throughout the year.

Second, we can make sure that bees have access to a water source. Many types of bees rely on water for their survival. Honeybees drink water, like us, but they also use water to keep the hive cool during hot days. When a water supply is nearby, bees are more likely to stick around.

Third, we can refrain from using chemicals and pesticides to treat our lawns and gardens. Some pesticides meant to repel or kill other kinds of insects can poison bees.

We don't have to be beekeepers to save the bees. By using responsible agricultural practices and by taking care of the environment, all people can work together to keep pollinators thriving.



The physical characteristics of a bee provide an excellent surface on which pollen can cling.

1. The text says the honeybee population has declined. By how much has it declined?
2. According to the text, what are some examples of actions people can take to protect honeybees?
3. Think about other steps you can take at home or in your community to save the bees. What else could you do?



## Go Digital

Search for more information about bees. What do they do with the pollen and nectar after they take it back to the hive?