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Date _____

Ag in 10 Minutes a Day!

The Buzz About Bees

If you've ever been stung by a bee, chances are you are not a big fan. But do you know that bees are one of the most important parts of our ecosystem? And most of the time, if we're calm around them and leave them alone, they'll do the same for us!

There are more than 20,000 species of bees on Earth. They can be found pretty much anywhere flowering plants are found. Bees have the essential job of **pollinating** countless species of plants by taking pollen from one flower to the next, dropping some at each new flower. Pollination allows new plants to grow and ensures we have many different types of flowering plants. In fact, about 1/3 of the food that we eat comes either directly or indirectly from plants pollinated by bees!



Image from [Honey Bees and Tansy | Berkshire Beekeeping](#)

The History of Bees

Bees are insects and are most closely related to ants and wasps. Over millions of years, they have evolved into the social, productive insects we know today. Bees have six legs and 5 eyes. Two of their eyes are compound or made up of many small lenses, and the other three are simple, like human eyes. This adaptation allows bees to have extraordinary vision! Their 2 sets of wings flap 200 times per second, and they can fly at 20 miles per hour! Fossil evidence shows that bees have been on our planet for at least 40 million years, but possibly as long as flowers, or up to 140 million years! Human artifacts show that bees and their honey have been used by people since ancient times.

Busy as a Bee



A day in the life of a bee is quite busy! Bees have specific roles within their hives. There are three different types of bees; a queen, drones, and workers. The queen's job is to keep the hive population at the right level by mating and laying eggs. There can only be one queen in the hive. If another develops, they will fight to the death. The queen is the only bee in the hive that can lay eggs, and she can choose whether they will be drones or workers! When a queen can no longer do her job, she is replaced. She is larger than other bees. Can you spot her?

Male bees are called **drones**. The only job they have is to mate with queens. Because they don't have any other responsibility, there are usually only about 50 or 100 of them in a hive, and they are often forced out of the hive and die once the warm weather mating season is over.

The remaining members of the hive are the **worker** bees. There are, on average, 50,000 workers in a hive, and they are all female. Bees only live between 40 - 45 days and their age determines their role in the hive. The youngest are responsible for cleaning up the hive. Next,

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they become nurse bees and take care of the babies in the **larval** and **pupa** stages, before they can fly. They produce a substance called **royal jelly** that is like milk that they feed to the larva and the queen. Older larva and the others, except the queen, are fed **bee bread**, which is a mixture of pollen and nectar.



Eventually, they start to produce wax from a gland on their abdomen, and they are **builders**, responsible for creating the thousands of **hexagonal** cells to hold the larva and store honey. They need to keep the wax cool enough so it doesn't melt, so they collect water and put it over the wax cells and on their backs and flap their wings to help the water evaporate to cool the hive. At this age, these bees are also undertakers, carrying out dead or dying bees from the hive.

In the next stage, worker bees become **guards**. Only bees belonging to their hive are allowed in, and the guards can identify the **pheromones**, or special smells, of their hive members. The oldest workers become the **foragers**. They fly around from flower to flower collecting nectar and pollen.



How do they know where to find the good flowers? Bees can communicate with each other by dancing! When a bee finds a good patch of flowers, she does a special "waggle" dance to point the others in the right direction, using the sun as a guide. You can see the blurry bee to the right doing her dance. These girls are remarkably busy and super smart!

How do Bees Make Honey?

Who doesn't love honey drizzled over a warm biscuit, or stirred into a cup of tea? The process that bees use to make it is quite interesting. Bees have many adaptations that allow them to make honey efficiently.

When a forager bee lands on a flower, she uses her long, straw-like **proboscis** to sip the nectar from the flower. Bees have 2 different stomachs. The nectar that the bee doesn't use for her own energy is stored in her honey stomach. While she sips up the nectar, she also collects grains of pollen in specialized pollen sacks called **corbiculae** on her back legs. You could say that corbiculae are "The Bees Knees!" Can you find the pollen in this picture?



Image from [Are you the Bee's Knees? | I DREAMED A WORLD](#)

By the time she returns to the hive, her body is carrying its own weight in nectar and pollen. She empties the pollen and then the honey making begins. She gathers a group of worker bees together, and then she vomits (yuck!) the contents of her honey stomach into the mouth of another bee, who does the same to another bee and so on. Inside the honey stomach are special **enzymes** that help to process the nectar into honey. After the nectar has been swapped between several bees, it is ready to be placed into one of the wax cells. The bees flap their wings to help some of the liquid evaporate, and then the cell is covered with wax to store the honey until it is needed. Yes, bees are pretty incredible!

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The Buzz About Bees

Directions: Read each question and fill in the best answer.

1. How many species of bees are there?

- A. 200
- B. 20
- C. 20,000
- D. 200,000

2. How fast do bees fly?

- A. 200 miles/hour
- B. 200 miles/second
- C. 20 miles/second
- D. 20 miles/hour

3a. What form of communication do bees use?

- A. dancing
- B. singing
- C. wing flapping
- D. sign language

3b. Where in the article did you find the answer to 3a?

- A. Introduction
- B. History
- C. Busy as a Bee
- D. Honey

5. As worker bees get older, what are some of the jobs they have? Mark ALL that apply.

- A. nurse
- B. queen
- C. guards
- D. foragers

6. Which body part is most like a proboscis?

- A. a leg
- B. a wing
- C. a tongue
- D. an eye

Extended Response

Explain how bees are beneficial to other forms of life on Earth. Make sure to include examples from the article and your own background knowledge or other research to support your answer.

Did you know...

Queen B herself, Beyoncé, is a beekeeper? She keeps 2 hives at her home. The 80,000 bees produce hundreds of jars of honey, which Beyoncé uses to help control allergies in her children. Honey is used for many health benefits; it has antibacterial and antioxidant properties that make it a true superfood!



Image from <https://www.billboard.com>

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TRY THIS AT HOME! HONEY SLIME

(ASK AN ADULT FIRST!)



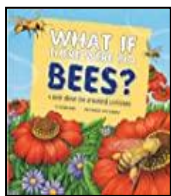
Materials:

- ¼ cup honey
- ¾ cup cornstarch
- 1-2 Tbsp. oil

Warm the honey in a microwave or a bowl of hot water until it is thin and liquid. Add cornstarch a few spoons full at a time until it is evenly mixed. Knead the mixture with your hands, adding oil a few drops at a time until the slime is stretchy and the consistency you like. You may need to coat your hands with cornstarch if it is too sticky, or oil if it is too dry. Store your slime in an airtight container or a zip lock bag.



CHECK OUT THESE BOOKS:

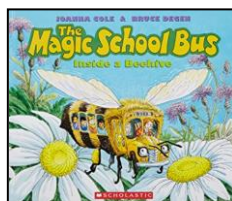


WHAT IF THERE WERE NO BEES

BY SUZANNE BUCKINGHAM SLADE

Grassland ecosystems can be found on nearly every continent.

Countless animals and plants live in them. So what difference could the loss of one animal species make? Follow the chain reaction, and discover how important honey bees are.



THE MAGIC SCHOOL BUS: INSIDE A BEEHIVE

BY JOANNA COLE & BRUCE DEGEN

Join Miss Frizzle and her class to travel inside a hive and see what a bee's life is like! Ms. Frizzle's class learns firsthand about how workers, drones, and the queen bees live together.



EXTRA CHEESE, PLEASE!

BY BETHANY BARTON

Not sure whether to high-five bees or run away from them?

Give Bees a Chance is for anyone who doesn't yet appreciate how extra special and important bees are to the world, and even to humankind!



THE BEE BOOK

BY CHARLOTTE MILNER

The perfect introduction to bee conservation for little ones. Learn all about the beautiful world of bees and their adventure from flower to flower.