Name: _____ Date: _____

How Do Bees Make Honey?

Reading level 11 (7th grade) · 1176 words

Linnea had eaten honey on her toast for as long as she could remember. She had never once wondered where it came from, not until the morning her uncle Soren handed her a veil, a hat with a net that keeps bees away from your face. His hives stood in a row at the edge of his apple orchard. The air in front of them was busy with bees coming and going. "How do bees make honey?" Linnea asked. "Watch one," said Soren. "It starts out there, in the blossoms."

Linnea picked out a single bee on an apple blossom. It pushed its face into the flower and drank through its proboscis, a long tube of a tongue. What it was drinking was nectar, the sugary juice that flowers make. Nectar is mostly water, and only a small part is sugar. It went into a special pouch called the honey stomach, or crop, which works like a backpack for carrying liquid home. Even a full load is only a tiny drop, well under a tenth of a gram.

The bee was already changing the nectar while she flew. As a forager swallows nectar, she adds an enzyme called invertase, a chemical helper that begins to break the flower's sugar into simpler sugars. Then she moved on, blossom after blossom. Bees can see patterns on petals in ultraviolet light, a color people cannot see, and the patterns help guide them. A single trip from the hive can take a bee to hundreds of flowers until her crop is full. On an ordinary day, a forager makes about ten round trips like this one.

Back at the hive, Soren lifted out a wooden frame covered in bees, and Linnea saw a forager pass her load to another bee, mouth to mouth. The forager was one of the oldest bees in the colony. A worker spends her first days inside, cleaning and feeding the young. Only after about her twentieth day does she leave the hive to gather food for the rest of her life. The bee taking the nectar was a younger house bee.

The house bee carried the nectar to a comb, a sheet of six-sided cells made of beeswax, and squeezed it into a cell. As she did so, she added a second enzyme, glucose oxidase. Wax is expensive for bees. To make a single pound of it, honey bees eat more than eight pounds of honey. Six-sided cells pack together with no gaps, and they hold a lot while using very little wax. Scientists have argued for a long time about how the bees end up with that shape, and one old idea compares the cells to soap bubbles pressing together.

Nectar in a cell is still far too runny to be honey. So the bees take the water out. They beat their wings fast, fanning air across the comb, and the water slowly drifts away into the warm air of the hive. Linnea held her hand near the frame and felt the hum. Nectar can be up to eighty percent water. By the time it becomes honey, most of that water is gone, and it pours as slowly as syrup.

When a cell of honey is ready, the bees seal it with a thin lid of wax. Soren tipped the frame toward the light, and Linnea saw rows of pale, capped cells. Honey keeps a very long time. It is so sugary and acidic that many germs cannot grow in it, and the glucose oxidase the bees added makes a little hydrogen peroxide, which also slows bacteria. Honey dug up by archaeologists has been found still fit to eat after thousands of years.

Why go to so much trouble? Honey is the colony's food for winter, when there are few flowers to visit. Soren keeps enough in each hive for the bees and takes only the extra. He gave Linnea a taste from the orchard hives and another from a jar he had bought from a beekeeper near a clover field. They looked different and tasted different. The color and flavor of honey depend on the flowers the bees visited. People have loved it for a very long time, too. Cave paintings in Spain show people gathering honey at least eight thousand years ago.

Making honey is only half of what Soren's bees do for him. As a bee works an apple blossom, yellow pollen catches in the branched hairs all over her body, and she packs some into baskets on her back legs to feed the young bees. Some of it brushes off on the next blossom. That is pollination, and without it the blossom cannot make seeds or grow an apple. In the United States, honey bees help pollinate more than a third of the fruits and vegetables people grow.

Linnea had pictured every bee as a honey bee in a hive, but most bees are nothing like that. There are more than twenty thousand known kinds of bee, and most of them live alone. Many dig a burrow straight down into bare ground and lay their eggs in little rooms off the tunnel. They make no honey at all. Honey bees are not even native to North America. Settlers shipped the first colonies across the ocean from England, more than four hundred years ago.

In Soren's vegetable patch, Linnea heard a louder buzz. A fat, fuzzy bumblebee was hanging upside down from a tomato flower, shaking. Soren explained that it was vibrating its flight muscles to shake pollen loose from the flower, which is called buzz pollination. Tomatoes, blueberries and cranberries all give up their pollen best this way. Honey bees cannot do it, so the bumblebee was doing a job that Soren's own bees could not. Some farmers who grow tomatoes in greenhouses keep whole colonies of bumblebees just for this.

Not every story at the hives was cheerful. One winter, Soren had lost several colonies. In 2025, scientists at the United States Department of Agriculture studied bees from collapsed colonies in California and other western states. They found high levels of viruses spread by a tiny parasite called the Varroa mite, and they called those viruses a likely cause of the deaths. Nearly all the mites they collected had become resistant to a common treatment. The scientists said this did not rule out other problems that honey bees have long faced, and other experts were still checking their study. Researchers are still working out how all the pieces fit.

Before Linnea went home, Soren gave her a small jar from the orchard hives. She decided to do two things. She would leave a sunny patch of bare ground in her own yard, in case a bee

that lives alone wanted to dig a nest there. Many of them prefer soil that is not thickly covered with plants. And the next time she saw a bumblebee on a tomato flower, she would stand back and listen for the buzz. What flowers do you think made the honey in your kitchen?

Questions

1. Where does a bee carry nectar home?

A. In her pollen baskets
B. In her honey stomach, or crop
C. In her wings

2. Why do bees fan their wings over the comb?

A. To dry the water out of the nectar
B. To cool the queen
C. To call other bees

3. In this book, what does "forager" mean?

A. A bee that guards the door
B. A bee that lays eggs
C. A bee that gathers food outside the hive

4. Why can the bumblebee do a job that Soren's honey bees cannot?

A. It is bigger than a honey bee
B. It can shake pollen loose by vibrating
C. It makes more honey

5. What did scientists report in 2025 about colony deaths?

A. Viruses spread by Varroa mites were a likely cause
B. They were caused by cold weather alone
C. Bees had flown away to new hives

6. Why does honey keep for so long?

A. Bees freeze it
B. It is sugary and acidic, so most germs cannot grow
C. It is kept in the dark

Words to know

proboscis: tube-like tongue
enzyme: chemical helper
forager: food-gathering bee
pollination: moving pollen
resistant: not harmed by

Answer key: How Do Bees Make Honey?

1. B. In her honey stomach, or crop
2. A. To dry the water out of the nectar
3. C. A bee that gathers food outside the hive
4. B. It can shake pollen loose by vibrating
5. A. Viruses spread by Varroa mites were a likely cause
6. B. It is sugary and acidic, so most germs cannot grow