



Honey Bee 101

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**Why do we invest in
pollinator education?**

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Why do we invest in pollinator education?

Whole Kids and Whole Cities are on a mission to nourish children and communities by improving access to fresh, healthy fruits and vegetables.

80% of food crops are pollinated by honey bees, the world's most important species.

In partnership with The Bee Cause Project, Whole Kids' Bee Grant program allows for schools and nonprofit organizations to receive support for educational beehives, so students can observe bees up close and learn about the vital role these pollinators play in our food system.

Discover More
Honey Bee
Education &
Grant Program
Info Here



About Honey Bees

- At the peak of the Spring, when all the flowers are blooming, there can be 50,000 bees in one colony.
- All the bees that forage for nectar and pollen are female worker bees.
- There is one drone (male bee) per 100 female worker bees. They have only one job - to mate with queens from other colonies.
- Humans have been keeping bees for 9,000 years.

Honey Bee Teamwork

- Every bee in a colony has a specific job that is determined by their age.
- Some jobs include: the *queen's court* - feeding and caring for the queen bee; *undertaker* - removing dead bees from the colony; *nurse bees* - feeding larvae; *guard bees* - keeping unwanted guests out of the hive; *scouts* - bees that look for good nectar sources or a new home and produce wax.
- During the Spring when worker bees are busy gathering food their life span is about 40 days.

Hard at Work

- Bees can fly up to 3 miles in search of good forage (food).
- Bees need water in addition to nectar and pollen. You can create a water station on your patio or in your backyard. Use a shallow dish with a few rocks in it for the bees to land on. Bees don't mind dirty water.
- One bee will produce about 1 teaspoon of honey in her lifetime.

Can you find the queen on the frame of bees on the front?



wholekidsfoundation.org/bees





All About the Queen

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What is Pollination?

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About the Queen

- There is typically one queen bee per hive. Her job is to lay up to 2000 eggs each day.
- Queens have a long abdomen and a big black dot behind their eyes (the thorax).
- Queen bees will only leave the hive to mate. Once they have mated with multiple drones, they return and spend the rest of their lives laying eggs.
- A queen bee can live 2-4 years.
- If a queen bee is unwell or unable to lay an adequate number of eggs to sustain the colony, the colony will replace her.

How Does a Bee Become Queen?

- When a colony needs a new queen, they select an egg that is just a day or two old.
- They feed the egg/larvae extra royal jelly which enables the reproductive organs to develop.
- The workers build a large peanut shaped cell around the larvae because it will be larger than a standard honeycomb cell.
- Usually a hive will create multiple queen cells. The first queen to emerge will sting the others cells to kill their rival.

Finding the Queen Bee...

- Spotting the queen in a hive of 50,000 bees can be a challenge.
- Look for the elongated abdomen and black dot.
- Look for a circle of worker bees (her court).
- Her movements will usually be skittish as she moves from cell to cell laying eggs.
- Some beekeepers mark their queen to make it easier to find her. Each year is assigned a color and they use a bee-safe paint marker.



About Pollination & Nectar

- Pollen is the powdery substance produced by flowers that contains the male cells they need to reproduce.
- Nectar is a sweet liquid produced by flowers to attract pollinators.
- When the honey bee lands on the next flower, a bit of pollen falls off fertilizing that flower allowing it to become a fruit (or vegetable)—many of which we eat!
- Honey bees take pollen back to their colony where it is their protein. Pollen is mixed with nectar to make “bee bread” that is fed to larvae to aid their development.

Pollen Pants

- When a honey bee lands on a flower to collect nectar (which they turn into honey) the static hairs on their legs pick up pollen.
- The technical name for pollen on a bees legs is a corbicula. Pollen baskets or pollen pants are more common names.
- Some beekeepers harvest pollen. People put it in smoothies or on salads as an added protein source.



Native Pollinators

A close-up photograph of a bumblebee with black and yellow stripes, perched on a cluster of vibrant purple flowers. The background is a soft-focus field of similar flowers.

Honey: From Hive to Harvest

A close-up photograph of a honeycomb frame, showing the intricate hexagonal pattern of the bees' cells. The honey is a golden color, and the frame is made of light-colored wood.

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Honey Bees & Other Species

- Honey bees are not native to North America. They were imported from Europe.
- There are over 20,000 species of bees and 4,000 are native to North America.
- Butterflies, beetles, flies and wasps are a few other types of pollinators. In some climates bats also pollinate.
- The buzz made by some pollinators can dislodge pollen from the flower.
- Some pollinators specialize in only one type of flower.
- Honey bees are the only insect that make food humans eat. Other bee species do not make honey.
- Many species like to nest underground, in dead branches or even burrow into wood.

Protecting Pollinators

- Buy and grow organic. Pesticides (neonicotinoids, in particular) are some of the most significant threats to pollinator populations. By buying organic food you are reducing pesticide use in the environment. When you garden, use natural methods and avoid pesticides. When you purchase plants, look to be sure they haven't been treated with a neonic.
- Allow your weeds to bloom. Dandelions are some of Spring's first food for pollinators. Allow them to flower and pick just before the seed pods burst.



About Honey

- Honey is the bees' food first - it's what provides them the energy to thrive as a colony.
- Nectar, once passed from bee to bee, is stored in cells and is dried to 18% moisture – that is when it is capped and is honey.
- Responsible beekeepers are careful to leave enough honey in a hive to sustain the colony.
- Humans are able to enjoy honey from managed hives because in nature, bees overproduce due to predators. When we harvest honey, we are acting as the predator, but as a beekeeper, we are also making sure that a hive does not become honey bound. That means the bees fill all space with honey leaving the queen no place to lay eggs.
- To extract honey from the frames, first the wax cappings are removed and then the frames are spun to remove the honey.

Tasting Honey

- To taste honey, put a drop in the center of your tongue - that is the umami center. That will allow you to taste all of the unique flavors in the honey. The tip of your tongue contains "sweet" tastebuds. If you taste honey there, you will only taste sweet.
- Honey never goes bad. Some honey will crystallize (become solid). To return honey to liquid, simply put the jar (glass preferable) in a pan of water on the lowest heat on your smallest stove burner for 15 minutes.

Health Benefits

- Honey is antibacterial - which is why it is so long lasting. It can also be used to treat minor skin wounds.
- Honey has a low glycemic index (as opposed to refined sugar) which means you get an even energy and avoid a sugar crash.
- Honey is anti-inflammatory and can help reduce swelling in the body.



Where Does Beeswax Come From?



The Importance of Pollinators



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About Beeswax

- Beeswax comes from bees, of course! Bees use 8 ounces of nectar to make 1 ounce of beeswax.
- Bees have wax glands on their abdomen.
- Young worker bees' wax glands are the most active from 12 days to 18 days old.

Is it Edible?

- Honey in its comb is considered a delicacy. And because beeswax is so resource intense for bees, it is often far more expensive than a jar of honey.
- May people like to eat honeycomb or chew it like gum. It is not harmful and does contain some protein.

Other Uses for Beeswax

- Beekeepers are careful to save any wax that results from honey harvest or general care of hives.
- Wax can be “rendered” or cleaned by melting it and straining it through a fine mesh or cloth.
- Beeswax is a common ingredient in many body care products like hand salve and lip balm.



In partnership with Whole Foods Market, we snapped a photo of the produce department set with everything you'd expect to find there. Then we removed all of the things that require pollinators. You can see that our choices would be much more limited without these important species.

What Else Requires Pollination?

- Almonds are one of the crops that require the services of honey bees. Many orchards hire beekeepers to bring in hundreds of hives when their trees are in bloom to ensure a hearty crop.
- Some beekeepers move their hives across the country with the seasons.
- Visit wholekidsfoundation.org/bees to learn more about pollination.

