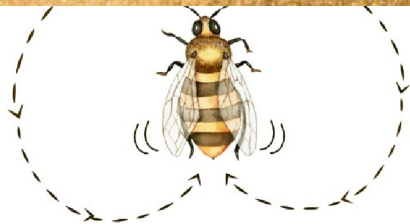
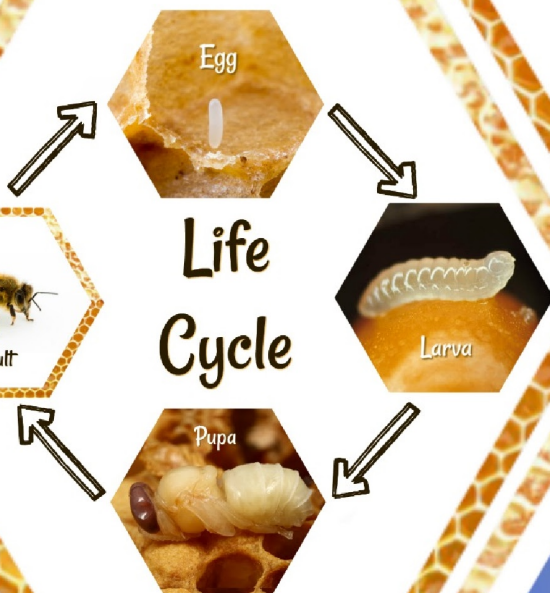


HONEY BEE UNIT



Honey Bee Dance

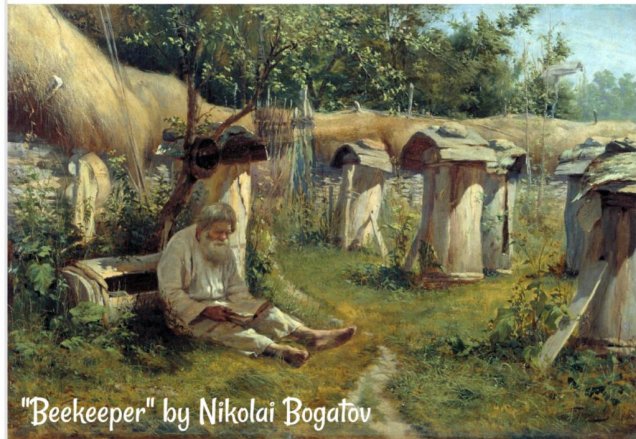
Honey Bee
Box





Bees are insects, so they have six legs, a head, thorax, abdomen, antennae, compound eyes, and in this case, wings. Some of the unique features of the bee are their glands that allow them to produce wax, their stinger that they use for protection, and their separate stomach they use for honey production.

Anatomy



"Beekeeper" by Nikolai Bogatov

Flight of the Bumblebee by 
 🎵 Rimsky-Korsakov

As you listen to this music can you just imagine bees flying from flower to flower busily collecting nectar or frantically flying away from a predator? Do you see how fast they need to play their instruments to get that sound?

Bee Art



Sun Dance

Bees navigate by the sun and landmarks. When they find flowers with good nectar they will come back to the hive and share the location with other bees through a "dance" where they move in half circles if it is close or in circular directions wiggling their tail if it is further away. The number of times she wiggles indicates how far the flowers are (More times means it's closer) and the direction she faces tells the bees if the flowers are to the right or left of the sun.

Communication

1. People have always hunted bees using smoke to calm and disorient the bee so they could take their honey, but ancient Egyptians are believed to be the first people to keep them.
2. Ancient Greeks made paint from dyed bees wax and believed that bees were the messengers of the gods.
3. It was said that the Roman god Jupiter gave the bee her stinger to protect her honey and that his wife Juno insisted that if the bee use it, she dies as payment for that weapon.
4. 1852 Lorenzo Langstroth invented the moveable frame beehive and bee keeping boomed!
5. 1858 Utah is nicknamed the "Beehive State" 10 other states later choose honey bees as their state insect for the symbolism of hard work and industry.
6. In 1973 Karl Von Frisch won a Nobel prize for discovering that bees dance to communicate.
7. 2006 the term Colony Collapse Disorder is used to describe the disappearance of bees.



Honey History

Honey Comb is built...

Bees have special glands on their abdomen that produce wax. They use that wax to make the hexagon shaped honey comb and to cap the honey and brood.

Bees fly from flower to flower collecting pollen on their legs and sucking up nectar into their honey sac (a special stomach they have that breaks down the sugar without them digesting it) When they arrive back at the hive they brush off the pollen to be stored for food and pass the honey to a house bee who then deposits it into a honey cell.

Collecting Pollen & Nectar

Storing & Harvesting Honey

The next few days bees fan the cell to evaporate the water, then when it is full, they cap it and let it age to become honey. Bees eat a mixture of pollen and honey called "bee bread". We harvest some of their food but leave enough for them to get through the winter.



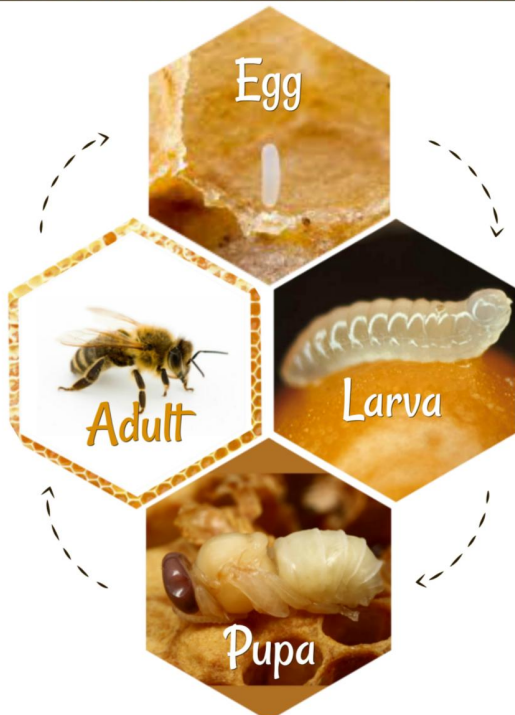
Honey bees are the most respected insects. They are known for their hard work, loyalty and industry. The worker bees are the ones who do the work that make them famous.

All worker bees are females who spend the first half of their life taking care of the queen, feeding the young, and maintaining the hive. They spend the 2nd half of their life gathering nectar to make into honey and pollen to store and eat.

They are the world's most common pollinators and are found on every continent except Antarctica. There are 10's of thousands of worker bees in a hive, each with a job to do that she knows instinctively.

Honey Production

Worker Bees



What happens when a bee stings?



When a bee stings you in self- or hive- defense it leaves their barbed stinger along with a venom sack that will continue to pump venom into the sting site

for up to 10 minutes or until removed. When they fly away without their stinger they leave part of the inside of their abdomen and will die shortly thereafter. They also release pheromones that encourage other near by bee's to join the attack.

Why do bees swarm?

Bees swarm when the hive gets too large and they split, forming 2 hives. About half of the bees will leave with the queen to make a new hive and the other half will stay and make a new queen.



Life Cycle

Sting & Swarm

Drones

Drones are the male bees. They develop slower than the Queen/Workers and their sole job is to mate with the queen. They are quite lazy and just hang out around the hive being fed by workers until the fall when they are kicked out (to preserve food for the hive) There are about 100 of them in a hive.



Queen

The Queen bee develops faster+ larger than the other bees because of the royal jelly fed to her as a larva. Her sole job is to lay eggs by the thousands every day. She can live up to 5 years before being replaced by a new queen where the other bees only live an average of 6 weeks in the summer or just over the winter.

Mystery of the Missing Honey Bee

For the last 10-20 Years bees have been disappearing without any sign of parasite or disease. Some have guessed it is a new form of pesticide. Since 2006 it has become an epidemic known as colony collapse disorder (CCD) where populations have declined by as much as 50% in some areas of the world.

What happens if all the bees disappear?

Bees are known as a keystone species because so MANY other species depend on them for survival. Bees are an important pollinator helping plants to reproduce every year. To make one pound of honey they need to visit about one million flowers! Without them, we would have significantly fewer plants which would affect the entire food chain.

For more information on what would happen if bees disappeared check out this video:



Queen and Drones

Keystone Species

Worker

Worker bees are female and start in the in the egg stage for 3 days, are in the larvae stage for 5 days, then are capped for 13 days as pupae before emerging on day 21 as an adult bee. They live the first 2-3 weeks of their 40 day life in the hive (unless they are the last brood of the summer then they will live through the winter)

Drone

Drone bees are male and start in the in the egg stage for 3 days, are in the larvae stage for 7 days, then are capped for 14 days as pupae before emerging on day 24 as an adult bee. They are fed after emerging for 6 days before leaving the hive and can live an 8 week life.

Queen

Queen bees are female and start in the in the egg stage for 3 days, are in the larvae stage for 5 days, then are capped for 7 days as a pupa before emerging on day 16 as an adult bee. They are fed and cared for their entire 3-5 year life.

Eggs

Larvae

Pupae

The Bee

by Emily Dickinson

Like trains of cars on tracks of plush
I hear the level bee:
A jar across the flowers goes,
Their velvet masonry
Withstands until the sweet assault
Their chivalry consumes,
While he, victorious, tilts away
To vanquish other blooms.
His feet are shod with gauze,
His helmet is of gold;
His breast, a single onyx
With chrysoprase, inlaid.
His labor is a chant,
His idleness a tune;
Oh, for a bee's experience
Of clovers and of noon!



"The Keeping of Bees is like the direction of sunbeams."
- Henry David Thoreau

*These are average life stage/ life span times.
**Larvae is the plural for Larva and Pupae is the plural for Pupa

Life Cycle

Bee Poetry

Observe a Bee on a flower



Where does it put the pollen?

Where does it put the nectar?

Are Bees hairy or smooth? Why?

What do you think nectar tastes like?

Bees are busy. Can you think of a time you worked as hard as a bee?

Are you afraid of bees? Do you think they are afraid of you?

How do you think bees find their way home?

Close your eyes and listen to them fly.

Can you imitate the sound? What if you were as small as a bee, how loud do you think that would be?

How many wings has a bee? Legs? What colors are bees?

If you were a bee which flowers would you go to first?

What do bees eat?



What parts of the flower attract bees?

How do bees survive the winter?

Honey

Try honey from different flowers. Can you taste the difference?

What makes honey sticky?



Home Remedies

Before modern medicine the only thing people could do when they were sick was to look to nature. They found a solution to many of their problems in honey. Many people still use honey for treating:

Nausea
Indigestion
Acne
Diabetes
Mild allergies
Weight loss
Dry skin
Inflammation
High cholesterol
Poor circulation
Skin wounds
Sore throats
Bee stings

Other uses

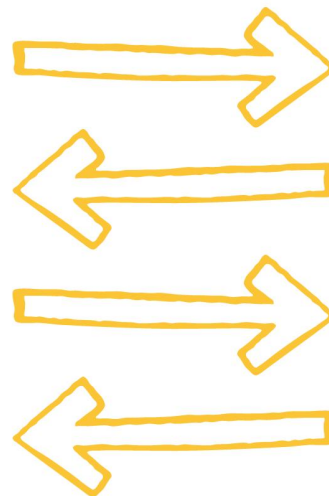
They found honey in Egyptian tombs that was thousands of years old and still good to eat! Honey won't go bad if kept sealed. It makes a great sweetener because it is easier for our bodies to digest than sugar. We also use the wax in candles, paint, to finish wood and use as chapstick.



It also is full of antioxidants, amino acids, and pre-biotics. Which means it helps prevent cancer, aids in digestion and gut health and has the building blocks our bodies need to keep our cells healthy.

Nature Journaling

Uses for Honey



Play Dough

Make a honey comb out of play dough using this hexagon to form the base shape of the cells. Then Build walls up on each side. Can you make little eggs or larvae for the comb?
Or fill it with "honey" then cap it off?

Dance

Honey bees communicate good sources of food by moving their bodies in a particular way once they arrive back at the hive. Facing the person you want to dance for, wiggle your bum as you walk towards them. Then turn left and circle back to your starting position. Repeat, turning right to circle back. Now face what you want them to see and wiggle your bum again.

Make a Bee

1. Take a peice of wire and bend a bump at either end.
2. Form a head, thorax, and abdomen after studying the anatomy of a bee or keep it simple and just form a head and rump for a round bee.
3. Push the clay sections on the wire, smoothing them out once in place.
4. Using a toothpick, make a hole in the thorax for the wings when it dries
Do not add the antennae or legs this time because they'd likely break off when you use it in the act it out activity.
5. After drying for 24-48 hours, paint it yellow and black, dry it, then use a toothpick to push tissue paper wings into the hole.

Act it out!

Act out some the jobs of a hive bee on your hive with your clay bee.

Act out the jobs of a field bee with the bee, flower, and yellow pom-poms for pollen.

Eat Like a Bee

Honey bees feed their young "bee bread" which is a mixture of honey and pollen. We also eat honey and some parts of flowers. Try some chamomile tea with honey and lemon to enjoy flowers and honey like a bee or pour some honey over buttered toast for your own "bee bread"

Hexagons

Bees have long known the secret of the hexagon. It is one of only three shapes that can form an unborken grid where every side and corner match. Triangles with equal sides, Squares and hexagons are the only shapes that can do that trick! Hexagons are special though because they can hold the most honey while requiring the least amount of wax to build them. Can you trace the small "Honey Comb template" into a honey comb pattern by matching up the sides and angles?
Save your "hive" when you are done for the act it out activity!

Life's Work of a Worker Bee



House Bee the First half

The first day she emerges she cleans her cell and the cells around it. Then she repairs the hive until day 3 when she makes "Bee Bread" a mixture of honey and pollen for older larvae and the drones. Day 6 she feeds young larvae milk which she makes from a gland in her head and special royal jelly if they are making a queen. Days 3-6 she may help remove the sick, dead, or drones (if it is autumn). Days 7-12 she may be in the royal court where she takes care of the queen. By Day 12 her wax glands are prime for building honeycomb, capping honey, and capping brood and will be until about day 35. When she is not shaping wax she may be receiving and depositing honey or pollen or fanning the entrance to the hive to help control temperature and humidity or release a scent to help guide field bees home. During her last days in the hive (Days 18-21) she will guard the hive from predators and intruders.

Field Bee the Second half

They save the dangerous work for the older bees. As a field bee she is exposed to all kinds of threats from predators + the elements, to insecticide. She leaves every day at sunrise to take 10 one-hour-long flights collecting mostly nectar in her honey sac and pollen on her leg sacks, but she may pick up water, or sap if needed to repair the hive. When she finds flowers full of nectar and pollen she first deposits her load with the house bees then dances to communicate where her find is to other field bees. She is a field bee until for the rest of her life.