

# Some Interesting Facts About Bees

Honey bees live in a highly organised colony where they work collectively for the survival of the hive.

When the hive is growing strongly in spring there will be:

- 1 queen within a colony
- 50,000 busy workers who usually live for 3-5 weeks
- 300 male drones
- 9000 hungry larvae needing to be fed 1300 times day
- 20,000 older larvae and pupae needing to be kept warm at around 35 degrees Celsius (which is close to our body temperature)
- 6000 eggs from which new larvae will hatch. Each egg looks like half a grain of rice



The queen is the true ruler of the hive who also serves through laying the eggs. She is the mother of all the bees in the hive. Her scent spreads throughout the hive and guides the behaviour of all the other bees.

The queen can lay 1000 to 2000 eggs a day in early spring when the hive is growing strongly. This is more than her body weight in eggs a day.

For this task she is cleaned, stroked, warmed or cooled and nourished with royal jelly by her court of workers.

After 3 days the eggs hatch into larvae and are fed for the next 3 days with royal jelly produced from glands in the worker bees' heads. They are then fed with a mixture of honey and bee bread made from pollen. Brood nurses feed the larvae approximately 10,000 times during their development. The larvae grow tremendously fast from a 0.1 mg egg to 150 mg in 6 days.

**Can you think of other animals that feed their young special food created from their bodies?**





When the larva becomes pupae, it spins a silk cocoon around itself and metamorphoses into an adult bee, similar to the transformation of a caterpillar into a butterfly.

As soon as she emerges from the cocoon the new worker's first task is keeping the hive clean and polishing the wax cells for the queen to lay eggs in and for food storage.

After 3 days she becomes a nurse bee to nurture the brood and to feed the drones of the queen.

At around 10 days of age, she develops a unique wax-producing gland in her abdomen, which produces tiny flakes of wax.

**Can you think of other animals that create a specialised building material out of their bodies?**

The bees work together to chew these pieces of wax until they become soft and pliable, and then add the chewed wax to the honeycomb to create the hives structure. The hexagon structure is the strongest and lightest possible structure and uses the least amount of wax for the highest internal volume. The 35 degrees Celsius temperature in the hive is also ideal for manipulating the beeswax: too hot and it would not keep its form, and too cold and it becomes brittle and breaks.

Many of the bees in the colony help maintain a stable temperature within the hive by fanning their wings at the entrance. Some bees become heater bees in the winter and water bearing bees collect water to cool the hive during the summer.

**Can you think of any other insects that create heat in their bodies like humans do?**



At 14 days the sting develops and they become guard bees to stop strangers or aged bees from entering the hive. If worker bees sting, they will die. When its barbed sting is pulled out, some of its internal organs are torn out.

At 21 days, they become foragers for pollen and nectar. They literally work themselves to death collecting enough food to support the hive.

Honey bees do a 'waggle dance' to tell other bees in the hive, precisely where to find the best flowers. Through a figure of 8 pattern, the bee describes the direction of the flowers in relation to the sun's angle and the flower's distance from the hive.



The more energetic and longer the dance, the better the source of food; and this is all performed in the darkness of the hive on the comb!

**Could you communicate where the canteen is by doing a dance the direction and distance of the canteen?**

Honey bees have pollen baskets on their hind legs to hold and transport pollen. After visiting a flower they groom themselves and brush the pollen stuck to their bodies into the pollen basket. This is taken back to the hive to make bee bread.

They also have a second stomach called a 'honey stomach' where they store nectar gathered from flowers. Bees deposit the nectar from their honey stomach into the honeycomb, where other bees buzz their wings over it to evaporate the water in the nectar until it thickens and becomes honey.

It would take 1100 bees to make 1kg of honey and they would have to visit 4 million flowers. They generally visit 50–100 flowers, often of the same species, on one collection trip. One bee's lifetime of foraging yields about 1/12 of a teaspoon of honey! Bees are the only insects that create a food that humans eat.





Drones are the male bees, and they aren't responsible for any work besides mating with the queen. They gather in a special drone congregation area high in the sky where queens come to mate. After mating, they die, giving their lives for the continuation of the hive.

If the hive is completely full of honey, bees breed and brood in late spring, the workers may create queen cells and begin the process of swarming. This happens when the old queen leaves with half the workers and honey to create a new hive, and the remaining bees await the new queen to emerge from the brood cell.

Bees have amazing sense organs which are much more sensitive than ours! They have 5 eyes in total. The 2 large compound eyes consist of approximately 7000 hexagonal lenses. These can act independently to sense light conditions, a range of colours (not red) and the sun's position. They are highly sensitive to ultraviolet (UV) light, which flowers use to guide the bee to the nectar (we can't see UV light). At the junctions of the lenses are tiny hairs, which tell the bee about wind direction and speed.

The 3 eyes on top of the head, the ocelli, register light intensity and wavelength so they can find their way back to the hive in the evening and fly the right way up! The antennae on top of the bees' heads have 170 smell receptors, which act independently and are highly attuned to useful aromas. They smell in stereo!

When a bee visits a flower to collect nectar and pollen, some of the pollen attaches to the bee's body and is transferred to the next flower they visit. This is called pollination, and is a very important part of plant reproduction. If a carrot wasn't pollinated, it could grow another carrot from the carrot top, but it wouldn't produce seeds.

Bees pollinate up to 60% of our most nutritious food crops. Without bees we wouldn't have apples, almonds, avocados, cherries, blueberries, citrus, melons, plums, peanuts, beans, broccoli, cucumbers, pumpkins and much more; nor would we have livestock feed like clover and lucerne. Conservative figures show that bees pollinate between 1-2 of every 3 mouthfuls that we eat.

