

- Objective:**
1. To create awareness about rock bees
  2. Understand their invaluable contribution to the food chain
  3. Learn peaceful coexistence

**Total Duration:** 60 minutes

**Session Plan Type:** Information – based, suitable for lecture\*

*\*This entire lesson plan can be converted into activity based learning by developing a script with characters like the Queen bee, worker bees, drone and flowers. The dance that bees use to communicate can also be enacted. The message of “Letting the Bees Be” can be emphasized. A small contribution can be collected from the audience and the proceeds can go towards nature conservation projects in your locality. Students can offer seeds/flowering plants that encourage bees as visitors.*

**Introduction: What are rock bees? What is the social pattern that is seen in a beehive?**

Source: <https://www.apnikheti.com/en/pn/livestock/bee/the-rock-bee>

The species is *Apis dorsata*. It is also known as Himalayan honey bee. It is bigger in size and is the largest honey bee among described breeds. The breed is approximately 17-20mm long. Rock bee is found in sub-mountainous regions up to an altitude of 2700m of all over India. They built giant single comb which is about 6 feet long and 3 feet deep. They shift from one place to another often in colonies. Because of its aggressive nature, they are difficult to rear. It gives an average yield of 50-80kg/colony/year of honey which is the highest amount of honey produced among Indian species.

Source: <https://www.perfectbee.com/learn-about-bees/the-science-of-bees/why-bees-rock>

One of the most dramatic events in nature occurs when bees swarm. In a nutshell, swarming is the process through which a colony resolves issues of limited space. By having a significant portion of the inhabitants of the colony relocate – along with a queen – we see reproduction occur at the colony level.

From one colony, springs two.

A swarm is generally a sign of a healthy, expanding colony.

The decision of relocation is challenging. A location too small for the storage of sufficient resources to see the colony through the winter is a death wish. Similarly, a location too exposed to the ravages of wind or with a chance of flooding is risky. To start the process of finding a suitable locating away from the existing hive, the departing bees will move to a temporary location, not far from the original location. And then something extraordinary happens. They choose collectively.

Hundreds of scout bees leave the temporary location in search of an acceptable final location, sometimes travelling several miles. They then report back and “dance” a message to their fellow scouts. After this extraordinary process has concluded, the entire swarm will fly to the chosen location. In this way, bees leverage the numerical and collaborative advantages that nature has bestowed upon them, to collectively decide on a prime location. The process is extremely effective. Bees choose their homes very well and very carefully!

This may all seem unbelievable but it is backed up by decades of research.

Source: <https://www.orkin.com/stinging-pests/bees/honey-bee-behavior>

Honey bees are social creatures and live within colonies with a queen, thousands of workers and a few male drones. Workers make these nests from wax, which they secrete from their abdominal glands. Within each cell, young workers place pollen and nectar as food for developing larvae. Male drones are ejected from the nest to die during autumn, after they have completed their only task in life: to mate with queens. The age of honey bees also plays an important role in determining which individuals perform various daily activities.

Honey bees are very adaptable. While honey bees forage for food in groups, a colony can survive without foraging for several years by living on food reserves and huddling in large, compacted masses during winter seasons. Honey bees behave similarly in Africa, Asia, Europe and other parts of the world, though certain species are known to be more aggressive than others.

Like some insects, honey bees behave defensively when intruders are near, guarding the entrance to their nests. However, honey bees are able to sting only once. Because stingers contain barbs and are attached to the worker's intestines, they detach from the stinging bee's body after attacking a victim. While a honey bee will die soon after transferring its venom, pheromones secreted during the attack will alarm and stimulate other worker bees to attack, as well.

### Why do bees make honey?

Source: <https://www.buzzaboutbees.net/why-do-bees-make-honey.html>

In short, honey bees make honey as a way of storing food to eat over the cooler winter period, when they are unable to forage and there are fewer flowers from which to gather food.

Honey is ideal for bees - it is full of nutrients and is a great energy food, because it is high in sugars.

### How do bees make honey?

Source: <https://www.perfectbee.com/learn-about-bees/the-science-of-bees/why-bees-rock>

Many gardeners choose and plant flowers to bloom across the seasons. This can help our bees, since the staggered access to blooming flowers through the spring, summer and fall extends the periods during which they can collect nectar and pollen.

**The time when bees have access to abundant sources of nearby nectar and can therefore produce the greatest volume of honey is called the *honey flow*.** It is something beekeepers consider carefully as they plan their gardens.

The honey flow is about the ability of bees to complete the creation of honey, so it also about the weather being sufficiently accommodating to allow them to visit nearby flowers and collect nectar.

Bees collaborate in amazing ways for this purpose. **Each individual worker bee has the “capacity” to produce a whopping 1/12th tablespoon of honey, during her entire life!** In isolation, that wouldn't cover half our toast! But when this level of production scales to 60,000 or more bees in a single hive, the volume of honey can be a sight to behold.

The characteristics of that honey – its color, viscosity and taste – depend on many factors, but a primary influence is the flowers visited by our bees. The number of flowers necessary to produce honey is also difficult to believe. To produce a pound of honey requires in the order of 2 million visits to flowers! Just think about that for a second – **two million trips to flowers, by many thousands of bees, to make that single jar of honey you enjoy over the breakfast table.**

A single colony can create 100 lbs (45 kg) or more of honey in a single year. And the cumulative distance covered by bees for that single pound of honey? **It's an incredible 55,000 miles!**

### Why are bees important in the ecosystem? Why do bees build hives in apartment complexes?

Bees have million hairs on the body. This makes pollination quick. Bees pollinate 80% of the flowers and thus very third morsel of food we eat is because of these pollinators.

The ledges outside a window are sturdy, with no moisture and minimal human disturbance and so bees build their hives. If the structure is shaky or if it is likely to get wet, bees will not build hives.

### How do bees build the hive?

Source: <https://www.orkin.com/stinging-pests/bees/how-do-honeybees-make-hives>

Worker honey bees make hives to store honey and feed themselves throughout winter when they cannot go outdoors to forage for food. Honey bee hives are made of six-sided tubes, which are the shapes for optimal honey production because they require less wax and can hold more honey.

Wild honey bees make hives in rock crevices, hollow trees and other areas that scout bees believe are appropriate for their colony. Similar to the habits of domesticated honey bees, they construct hives by chewing wax until it becomes soft, then bonding large quantities of wax into the cells of a honeycomb. When worker bees crowd together within a hive, the hive remains at around 30 to 35 degrees Celsius, the temperature necessary to control the texture of the wax.

Although worker bees only live for approximately six weeks, they spend their lives performing tasks that benefit the survival of their colony. Around the time a worker bee turns 10 days old, she develops a unique wax-producing gland inside her abdomen. Workers forage for food and gather nectar from different flowering plants. When they carry nectar within their pollen pouch, it mixes with a specialized enzyme. After returning to the hive, the worker bee transfers the nectar from her tongue to another worker's tongue, where the liquid from the nectar evaporates and becomes honey.

The glands of worker bees convert the sugar contents of honey into wax, which oozes through the bee's small pores to produce tiny flakes of wax on their abdomens. Workers chew these pieces of wax until they become soft and moldable, and then add the chewed wax to the honeycomb construction.

The hexagonal cells of the honeycomb are used to house larvae and other brood, as well as to store honey, nectar and pollen. When beekeepers extract honey from hives, the comb is easily left intact, though beekeepers sell honey comb as well.

### How to peacefully coexist with bees?

- If bees are about to build, spray some garlic juice. The pungent smell acts as a repellent.
- If there's a hive, draw the blinds and let there be no bright lights as artificial lights confuse the bees.

### What to do if a bee stings?

Remove the stinger as soon as you can.

Wash the affected area with soap and water.

Apply a cold compress.

Take an over-the-counter pain reliever as needed. ...

If the sting is on an arm or leg, elevate it.

Apply hydrocortisone cream or calamine lotion to ease redness, itching or swelling.

Source: <https://www.healthline.com/health/outdoor-health/home-remedies-for-bee-stings>

### Other products from bees

Source: <https://www.worldbeeday.org/en/did-you-know/92-honey-and-other-bee-products.html>

Bees and their pollination services contribute to maintaining biological balance in nature and enable various animal and plant species, including humans, to thrive. They also provide bee products that are an entirely natural food source. People have used them since time immemorial, and they are a particularly suitable source of food in today's increasingly faster pace of life.

Alongside honey, which is certainly the most widespread bee product, bees also provide us with pollen, royal jelly and wax. Beeswax is used extensively in the cosmetics industry.

### Why should we let the bees be?

After all the hard work that the bees do, it seems like humans are stealing from the bees. Few beekeepers set aside honey for the bees to use and take a moderate amount for consumption. They are careful not to kill bees. But this is not the case everywhere. So find out the source of honey, and if you must take honey or any other product obtained from bees, ensure that the practices are ethical.

Source: <http://mentalfloss.com/article/556769/amsterdam-helping-bee-populations-with-insect-hotels>

### Country that is attracting more bees – Amsterdam

**Plants that attract bees:** Eucalyptus, Ixora, Lavender

There is no scientific data in India to record the number of hives seen a decade ago and now. But a marked decline has been noted as many residents burn the hive, killing all the bees.

Read more at: <https://scroll.in/article/839067/bees-are-disappearing-in-india-and-we-are-slowly-learning-why>

Activities at: <https://www.kidssoup.com/activity/bees-crafts-activities-lessons-games-and-printables>

***For conducting awareness sessions on bees, contact: [thehivetrust@gmail.com](mailto:thehivetrust@gmail.com)***

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