

Name \_\_\_\_\_ Date \_\_\_\_\_

## THE BUZZ ABOUT HONEYBEES

Honey is sticky, sweet, gooey, and tastes great! You can buy honey at the market and in grocery stores, but do you know where honey comes from? Honey is made by the honeybee. All bees make honey, but there is one bee that makes more than all the rest. The European honeybee, *Apis mellifera*, makes so much honey that bee farmers are able to harvest honey from their hives! Hives are where honeybees live. They are very social insects, and many bees live together in one hive. All bees aren't equal however, and in a hive there is always one queen, several drones, and many workers.



**Queen**



**Drone**



**Worker**

The queen is the largest bee in the colony. The queen can live for about two years, and on average she lays 1500 eggs a day!

All the drone bees are male. There are usually about two hundred drones in a colony, but in new colonies the number is lower. Drones don't have a stinger, and can't protect the hive. Drones don't clean out the hive or collect nectar either. The only job a drone has is to mate with a queen from a different hive.

The smallest bee in the colony is the worker bee. Depending on the size of the hive there can be between 20,000 and 200,000 bees in one colony! Worker bees are always female, and they're all sisters. During the summers they only live for twenty to forty days. If they hatch and are reared during the fall, they can live through the winter for about 140 days. Worker bees are responsible for everything that happens in the hive. They make the comb where the honey is stored and eggs are laid. They take care of the larvae (newly hatched bees) and the queen, gather nectar and pollen, evaporate the nectar to make honey, clean the hive, defend the hive and lay drone eggs. Workers are very busy bees!

Why do bees make honey? Bees make honey so that the colony will have food during the winter. They make the honey from flower nectar collected during the spring and summer. Bees have two different stomachs: a normal stomach and a honey stomach. They use their tongues to suck the nectar out of the flower, and then they store the nectar in their honey stomachs.

When the collecting bee has a full honey stomach, it will fly back to the hive and give the nectar to a house bee. A house bee is a young worker bee that hasn't started collecting nectar yet. After receiving the nectar, the house bee spends some time "chewing" it. Bees don't have teeth, so it doesn't chew the nectar in the same way that you chew food. Instead, the bee mixes the nectar with *enzymes*. Enzymes are chemicals that help to break apart the sugars in the nectar, making it easier for the bees to digest later on.

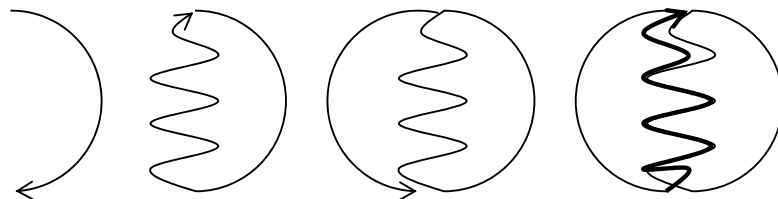
The house bee then spreads the nectar into cells in the comb, so that water can evaporate from it. When enough water has evaporated, and the nectar is gooey and sticky, it is called honey. A worker bee then puts a wax cap on the cell, and the honey is stored as food for the bees. An average colony of bees can eat between 120 and 200 pounds of honey a year!

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**THE BUZZ ABOUT HONEYBEES, continued**

When a bee returns with a full honey stomach, and wants to tell the other worker bees where to go, what does she do? Bees can't talk, and they can't draw maps, so instead, they dance! Different dances show the other bees the distance, direction, quality and quantity of nectar. There are two main dances that bees use to tell the other workers where to find nectar. If the source of the nectar is close to the hive, the worker bee will dance the *round dance*. In the round dance, the bee will circle first in one direction and then in another. The bee doesn't give the direction of the flower, however the other bees will be able to get the scent of the flower from the dancing bee. If the source of the nectar is further away from the hive, the worker bee will dance the *waggle dance*. The waggle dance is a little more complicated than the round dance, as the bee also lets the other bees know the direction in which the flower is. Bees don't use road signs to let them know which way to go, instead they use the sun. Imagine that the sun is directly in front of the bee as it flies from the hive to the flower. The bee remembers the position of the sun, and tells the other bees through the dance.

But it's dark in the hive, and the bee only has the honeycomb to dance on. On the comb, "up" is the direction of the sun. The waggle dance is a combination of the round dance, with a little straight waggle in the middle. The bee will walk around in half a circle, the walk straight swinging from side to side (wagging) in the imaginary direction of the sun. If the sun was directly in front of the bee, then the bee will walk up on the honeycomb. The bee will then continue in a half circle in the opposite direction, and do another waggle line up. It will repeat the half circles and waggle lines over and over. The finished dance looks like a figure eight.



If the bee flew from the hive to the flower so that the sun was always on its left side, it would then dance on the honeycomb, with the waggle line going from left to right, so that "up" would be on the bee's left side. If the source of the nectar is fairly close to the hive, the waggle line would be fast and energetic. But if the source of the nectar were very far away, the waggle line would be very slow.

Both the round dance and the waggle dance show the location of the nectar source, but it is the smell of the flower that helps the worker bees find the exact spot. After the dance is finished, other worker bees can go out and collect nectar from the same flower or group of flowers. When another worker bee returns from a different source of nectar another dance happens.

Bees sure are busy! That's why we use the expression "busy as a bee." They spend their entire lives working, from the time the sun comes up in the morning, to the time it sets in the evening. Best of all, they give us the wonderfully gooey, sweet and sticky food called honey!

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**Answer the following questions about bees.**

1. What is the common name of *Apis mellifera*?
  
2. What is the largest bee in a colony?
  
3. What are the male bees called?
  
4. List three of the jobs of a worker bee:  
a) \_\_\_\_\_  
b) \_\_\_\_\_  
c) \_\_\_\_\_
  
5. Why do bees make honey?
  
6. Why do house bees “chew” the nectar?
  
7. What happens to the nectar to make it turn into honey?
  
8. What are the two dances bees use to communicate?  
a) \_\_\_\_\_  
b) \_\_\_\_\_
  
9. Why would a bee use one dance instead of the other?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
  
10. Describe the shape of the waggle dance. What does the waggle mean?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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**Answers to “Honeybees”:**

1. European honeybee (or just “honeybee”)
2. The queen is the largest bee in the colony.
3. The male bees are called drones.
4. Three of the following:
  - make the comb where the honey is stored and eggs are laid
  - take care of the larvae (newly hatched bees)
  - take care of the queen
  - gather nectar and pollen,
  - evaporate the nectar to make honey
  - clean the hive
  - defend the hive
  - lay drone eggs
5. Bees make honey so that the colony will have something to eat during the winter.
6. House bees ‘chew’ the nectar so that they can mix enzymes into it. Enzymes break down the sugars in the nectar, making it easier for the bees to digest.
7. Water evaporates from the nectar, leaving behind honey.
8. a) Round dance  
b) Waggle dance
9. The distance of the nectar source to the hive dictates what dance is used.
10. The waggle dance is a half circle, followed by a straight-line where the bee waggles, followed by another half circle (drawing is acceptable). The waggle shows the other bees the direction and the distance of the nectar source.