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# Discovery

*Scripture & Science for Kids*





# 20,000 BEES UNDER THE SUN

CALEB COLLEY

There are over 20,000 species of bees worldwide, and their differences have interested scientists for many years. All bees pollinate, but there are differences between bee species. Perhaps you have

noticed different kinds of bees in your own backyard. There are about 50 types of bumblebees, which are much larger than other kinds of bees, but very similar to honeybees. Colonies of bumblebees survive only during the warm season, and store less honey than honeybee colonies do. Honeybees

survive only as members of colonies, which live inside nests called "hives." Worker honeybees use nectar, pollen, water, and plant resins to construct these hives. A single hive can contain up to 80,000 bees.

Carpenter bees, on the other hand, are not social, and live for only one year. Carpenters nest in wood, and the males have no stingers. If a bee ever stung you,

the culprit probably was a honeybee or a sweat bee. Sweat bees usually nest in a tunnel in the ground, but some nest in wood. Leaf-cutting bees, however, use leaves to construct their

nests. Their nearly circular leaf cuttings are perfect for lining their nests underground or in wood.

Mason bees, smaller than honeybees, chew plant fiber and combine it with mud in

order to construct their nests. Like carpenter bees, masons are solitary. Each female bee builds her own nest without help, because there is no hive. It's pleasant to have mason bees around, because they sting only if stepped on or squeezed. (They make no honey, so they don't feel compelled to protect a "sweet stash.")

In 1956, Brazilian scientists accidentally introduced "killer" bees, or Africanized honeybees, in North and South America. If "AHBs" feel threatened, they can attack and pursue for a quarter of a mile. AHB venom is no more dangerous than that of common honeybees, but AHB may attack even if their nest is undisturbed, and respond in greater numbers than honeybees do.

Different kinds of bees are among the most important insects, because our mighty God gave them lots of fascinating abilities. As we study them, we are reminded of His creative power and control of the animal kingdom.



Blue Orchard Mason Bee



Bumblebee



Killer Bee



Carpenter Bee



Honey Bee



Leafcutting Bee



# The Amazing Bee Dance

KYLE BUTT

If we want to tell someone how to get to a place, we simply give them directions. We might say that the place is four miles to the south. But how would we give directions if we could not talk or if we could not write in a language with words?

God gave the honeybee a wonderful way to communicate without words. A worker bee that finds pollen and nectar brings them back to the bee hive and passes the food to the other bees. As the worker bee passes out the food, it performs a very special dance. If the food is far away (which it usually is), the bee does a "waggle" dance. During the dance it makes sounds with its wings.

The amazing thing about the dance is that it tells the other bees exactly where the food is. The bee uses the Sun as a reference point. If the bee dances in a straight line to the right, then the food is directly to the right of the Sun. If the bee dances straight up, then the food is straight toward the Sun. If the bee dances straight down the honeycomb, then the food is directly away from the Sun. Furthermore, the sounds that the bee makes as it "waggles" its body

from side to side help the other bees know how far away the food is and exactly where to find it.

As you may know, the Sun constantly changes its position in the sky. It moves one degree to the west every four minutes. It just so happens that the bees know that the Sun moves and they can change their dance to help the other bees find the food.

This remarkable "dance language" could not have evolved. Codes and languages such as this must have been programmed into bees by an intelligent Designer. Not only does the bee dance show other bees the way to food, but it shows humans that there is an awesome God who gave the bees an astonishing way to communicate.





# Let's All **Bee** Working Together

KYLE BUTT

Teamwork is when every person on a team does his job so that the team accomplishes its goal. Also, on a team, not everyone does the same job. Did you know there is a very special "team" in nature? That's right, a beehive happens to be one of the best examples in the world of teamwork.

Several different kinds of bees live in a hive. The queen bee lays all the eggs for a hive. Special worker bees take care of the eggs and help them hatch into bee larvae. Workers then feed the larvae and help them grow.

Different worker bees clean up the area close to the queen where she lays her eggs. Worker bees have other jobs as well. As they get older, they begin to forage for food. They also guard the hive, ready to sting any attackers (like hungry bears trying to steal their honey). There are also a few male bees called drones that mate with the queen so that she can continue to lay eggs.

Most of the worker bees in a hive are females that cannot lay eggs. But sometimes a hive needs a new queen. When this happens, a special baby bee is chosen and fed a diet of "royal jelly." This royal jelly somehow helps the tiny bee to grow into a queen that can lay eggs.

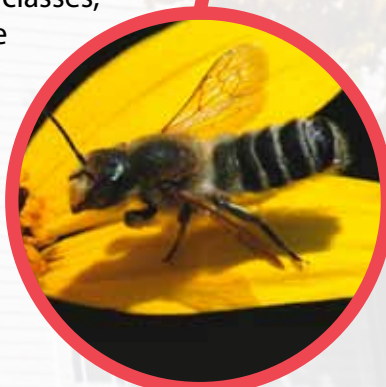
Bees know their jobs and do them perfectly. Because of this, thousands of bees in a hive can live, make honey, and work in a very organized way. Like bees, we can also work together in the Christian "hive" known as the church. The apostle Paul said that the church is one body that is made up of many different members who have different jobs (1 Corinthians 12:12-31). Some men preach, others are elders, some ladies teach children's Bible classes, and other members visit the sick, and take food to the hungry. Not all Christians do the same jobs, but each job is important and helps the church to operate in a productive, organized way, just like a bee hive.



Arrow pointing to queen bee



Bees taking care of larvae



Worker bee getting food



# Sweet Sym-bee-o-sis

ERIC LYONS

On a football team, a quarterback benefits from having good receivers, who can catch difficult passes. Likewise, receivers benefit by having a good quarterback to throw them catchable balls at the right time. The relationship between a quarterback and his receivers is a symbiotic (sim-bee-AH-tic) relationship. A symbiotic relationship is one that is mutually helpful or dependent. A quarterback is helped by having good receivers, and receivers are helped by having a good quarterback. They depend on each other to succeed.



Honeybees, however, also benefit from plants. Honeybees use pollen from plants as a source of protein, especially for their young. Honeybees also use the nectar from flowers to make honey. So, honeybees help plants, and plants benefit honeybees—a perfect example of symbiosis.

Have you ever thought about how bees, plants, and symbiosis point to a Creator? If bees need plant life to survive,

and many kinds of plant life need insects (especially honeybees) to reproduce, then both vegetation and insects would need to have been created at virtually the same time. The Bible indicates that God made all plant and animal life within three days of each other. On the other hand, evolution says that everything evolved gradually over millions of years. Yet, how could flowers that needed help being pollinated and bees that needed pollen and nectar from flowers, have been separated by millions of years and still survived? They couldn't. In truth, the sweet symbiotic relationship between honeybees and vegetation is just another proof **for** Creation and **against** evolution.

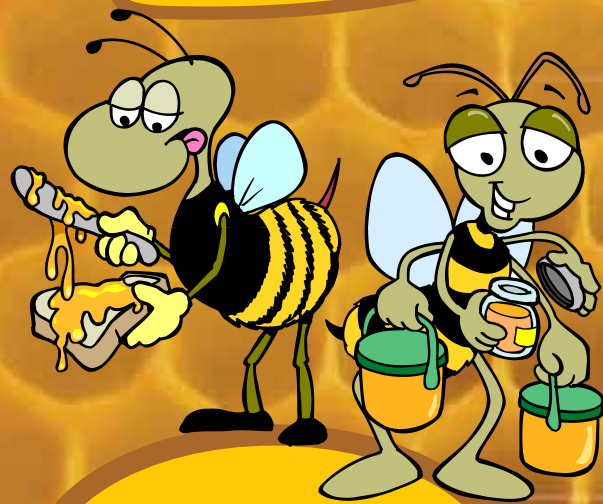
One of the most important symbiotic relationships on Earth is between honeybees and various forms of vegetation. God made many kinds of fruit trees and plants that need to be pollinated in order for them to bear fruit. How could pollen get transferred from plant to plant, thus fertilizing vegetation and making the growth of fruit, vegetables, and flowers possible? God made flying insects.

It is estimated that nearly one-third of the American diet comes from fruit trees and plants pollinated by insects. Amazingly, about 80% of this vegetation is pollinated specifically by honeybees. Needless to say, bees are important to many kinds of vegetation (and to us, as well, since we eat fruits and vegetables).





# ACTIVITY PAGES



## FILL IN THE BLANKS

1. Like bees, Christians can work together in the Christian "hive" known as the \_\_\_\_\_.
2. The symbiotic relationship between honeybees and vegetation is just another proof for \_\_\_\_\_ and against \_\_\_\_\_.
3. The psalmist wrote of God: "How sweet are Your \_\_\_\_\_ to my taste, \_\_\_\_\_ than honey to my mouth!" (Psalm 119:103).
4. \_\_\_\_\_ bees nest in wood, and the males have no stingers.
5. Leafcutting bees, on the other hand, use \_\_\_\_\_ to construct their nests.



1. \_\_\_\_\_ Lays all the eggs for a bee hive
2. \_\_\_\_\_ Take care of the bee eggs and help them hatch into bee larvae
3. \_\_\_\_\_ Mate with the queen bee so that she can continue to lay eggs
4. \_\_\_\_\_ What is fed to a special baby bee that is chosen to become the next queen
5. \_\_\_\_\_ A relationship that is mutually helpful or dependent
6. \_\_\_\_\_ Sweeter than table sugar
7. \_\_\_\_\_ This man once was asked, "What is sweeter than honey?"
8. \_\_\_\_\_ Gave the honey bee its "waggle" dance

## MATCHING



- |            |                  |
|------------|------------------|
| A. Samson  | E. Queen         |
| B. Workers | F. "Royal Jelly" |
| C. Honey   | G. Symbiotic     |
| D. God     | H. Drones        |

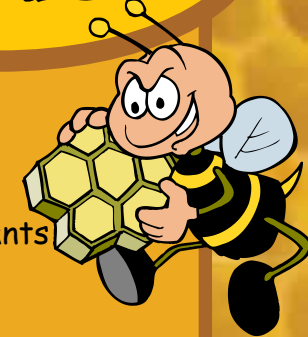


Illustration by  
Shelby Murray Neosho, MO

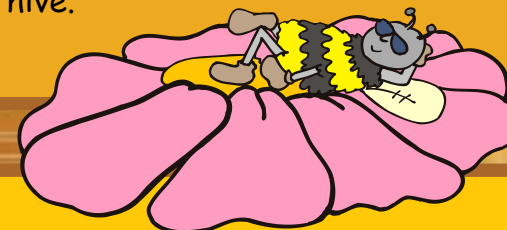
Hey kids, send your questions about the Bible and/or science to Digger Doug! Also, Digger Doug loves to receive your poems and artwork (lots of your work is featured in *Discovery*). Digger Doug can't return everything he receives, so keep a copy for yourself.

Digger Doug  
230 Landmark Drive  
Montgomery, AL 36117

## TRUE OR FALSE



1. \_\_\_\_\_ One of the most important symbiotic relationships on Earth is between honeybees and various forms of vegetation.
2. \_\_\_\_\_ Several different kinds of bees live in hives.
3. \_\_\_\_\_ The Bible indicates that God made all plant and animal life within three days of each other.
4. \_\_\_\_\_ Most of the worker bees in a hive are males.
5. \_\_\_\_\_ About one-third of the American diet comes from fruit trees and plants pollinated by insects.
6. \_\_\_\_\_ There is only one kind of honey in the United States.
7. \_\_\_\_\_ Honey can be made from many different flowers, including Orange Blossoms and Blueberry flowers.
8. \_\_\_\_\_ There are over 20,000 species of bees worldwide.
9. \_\_\_\_\_ The largest bee hives can only hold about 500 bees.
10. \_\_\_\_\_ A worker bee can inform other bees that it has found food by performing a "waggle" dance in the hive.



### Dear Digger Doug,

Are germs considered "living animals," and do they have brains?  
—Ashley, Newport, OH

### Dear Digger Doug,

Did God tell people about germs before scientists learned about germs?  
—Justus, TX



Dear Ashley and Justus,

Thanks for sending excellent questions about germs. I always love getting thoughtful questions from *Discovery* readers. Germs are microscopic, living things that can sometimes make our bodies sick, but are too small to have brains. Of course, we do some things to prevent the spread of germs, such as washing our hands and covering our mouths when we cough. However, certain germs are helpful, such as bacteria that make our digestive systems work properly. Other germs help scientists develop medicines and vaccines.

The children of Israel knew nothing about germs, but God knows everything (Psalm 139:1-4), and so He commanded the Israelites to do certain things to protect themselves against deadly germs. For example, God commanded the Israelites to avoid touching dead bodies (Leviticus 11:31-33) and to stay away from sick people (Leviticus 13). God even prescribed a recipe for ancient "soap" (Numbers 19). Hundreds of years before modern scientists learned about germs, God knew all about them, and protected His people. It is wonderful to serve the all-knowing Creator.





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# HELPFUL HONEY

DAVE MILLER

Honey—the sweet, golden liquid that has delighted young and old alike since the beginning of time (Genesis 43:11; Mark 1:6). Honey is much sweeter than table sugar, so most microorganisms cannot grow in it because of its low water content. But where does this amazing food come from and how is it made?

It all begins when bees buzz forth from their hive, traveling as much as 55,000 miles and visiting more than two million flowers, to gather nectar from blossoms. Then they return to one of the world's most efficient factories—the beehive. There they use their specially designed stomachs to ingest, modify, and process (regurgitate) the nectar several times. After the final regurgitation, the honey is stored in honeycomb—a type of wax that certain worker bees secrete. Nectar is high in both water content and natural yeasts, which would cause the sugars in the nectar to ferment. To stop this from happening, bees

fan their wings, creating a strong draft across the honeycomb to cause much of the water from the nectar to evaporate. Then the honeycomb is sealed.



Now the honey may be used by the bees for energy, or it may be harvested by people to eat. The color and flavor of honey differs depending on what types of flower blossoms provided the nectar. In fact, there are more than 300 unique kinds of honey in the United States. Honey can be made from many different flowers, including Clover, Eucalyptus, Orange Blossoms, Avocado, Alfalfa, and even Blueberry flowers.

There's no question that God designed the honeybee and the honey that bees produce (Genesis 1:30). God told the Israelites that He would bring them out of Egypt and take them to "a land flowing with milk and honey" (Exodus 3:17), meaning that the land would be bountiful and blessed. The Philistines asked Samson, "What is sweeter than honey?" (Judges 14:18). As sweet as honey is, always remember that the psalmist said God's words are sweeter and more desirable than honey and the honeycomb (Psalm 19:10). He exclaimed: "How sweet are Your words to my taste, sweeter than honey to my mouth!" (Psalm 119:103).



## ANSWERS

MATCHING: 1. E (Queen); 2. B (Workers); 3. H (Drones); 4. F ("Royal Jelly"); 5. G (Symptom); 6. C (Honey); 7. A (Samson); 8. D (God). FILL IN THE BLANKS: 1. church; 2. creation, evolution; 3. words, sweeter; 4. Carpenter; 5. leaves, TRUE OR FALSE 1. T; 2. T; 3. T; 4. F; 5. T; 6. F; 7. T; 8. T; 9. F; 10. T.

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