



# Honey Bees

## Goal

Students learn about communication by exploring honey bees and comparing them to other insects and animals.

## Curriculum Alignment

Find a list of which Common Core State Standards and NC Essential Standards this lesson plan aligns with on the lesson plan page at [www.growing-minds.org](http://www.growing-minds.org).

## Materials

- Animal cards
- 2" by -9" strips of colored construction paper (at least five per student)
- Rulers
- Pencils
- Tape

## Activities

### Communicate Like a Bee

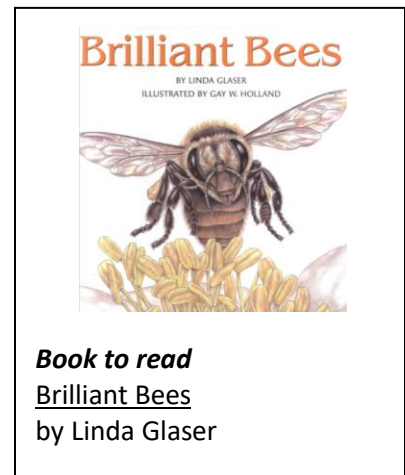
Explain that all animals have a means of exchanging information with one another. Some use visual signals, such as body movements or facial expressions, to convey meaning. For example, a gorilla beats its chest to intimidate others and to assert authority. Other animals rely on sounds to communicate. Birds sing, coyotes yip, and dolphins make sounds in the air-filled sacs connected to their blow holes. Hold up an animal card (included in the lesson plan materials) for the class to see. Ask students to brainstorm all of the ways they can think of that the animal communicates through sound or movement. Write the answers on a chart. For example, a dog barks and whines, but he also wags his tail, growls and show his teeth, and jumps to communicate. Animals also use chemical signals as important cues that can be detected by the sense of smell or taste. For example, dogs and cats mark their territories by urinating.

How do people communicate? Words, smiles, hugs, pat on the back, etc.

What about honey bees? How do they communicate to one another about the location of flowers far from the hive? Ask students to make guesses about how honey bees communicate.

### Read a Book

Read [Brilliant Bees](#), to learn more about honey bees. As the class reads the book, identify words you can use to make a honeybee word wall.





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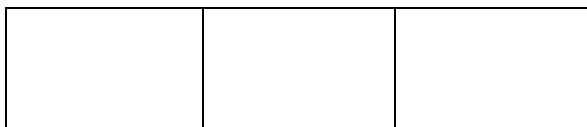
## Discussion

Return to the question of how honey bees communicate- What did students learn in the book? Typically, students assume that it is only the bees' buzzing that conveys the location of the nectar source to the other bees, so they are surprised to learn that honey bees also "dance" to communicate this information to their hive mates. Explain that in addition to dancing to communicate about the flowers, the bees bring back the flower's scent to the hive as another tool to help other bees find it, so they also use scent to communicate!

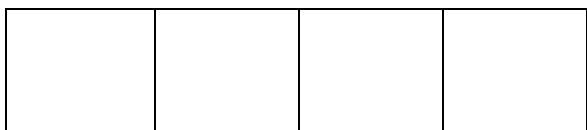
Explain that students, too, can master the honey bees' dance and communicate information. Review honey bee's methods of communicating the location of flowers and nectar which is food for the bees. When the flowers are at a distance greater than 300 feet from the hive, she performs a "wagging" or waggle dance in the pattern of a figure eight. These figure-eight movements are repeated for several minutes and are accompanied by a rapid "wagging" of the bee's abdomen (13-15 times per second). If flowers are close by, the bee simply circles around. Demonstrate (your version) of the honey bee dance to students and ask them to do each dance too.

## Math Link

Inquiry- Why do honey bees use hexagons to build their hives instead of triangles, squares, pentagons, or octagons? Explain that a hexagon is a type of polygon. What other shapes are polygons? Show your students pictures of different polygons. Ask them to look around and identify polygons they can see in the room. Next give your students strips of different colored construction paper measuring 2" x 9", rulers, and pencils. Refer to the diagrams below, and generate a discussion about the number of sides on each type of polygon and talk about the sides being equal in size. Then teach your students how to measure and divide the strip, depending on the number of sides on a particular polygon. So, if you want to use a pyramid shaped polygon (triangles), you would teach them to measure 2 sides, or 3" then draw a line on their paper strip. They would end up with a strip divided into three 3" x 2" rectangles.



Triangular polygon once folded and taped. (fold at 3")



Cube polygon once folded and taped. (fold at 2 1/4")



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Pentagon, once folded and taped. (fold at 1.8")



Hexagon, once folded and taped. (fold at 1 1/2")



Octagon, once folded and taped. (fold at 1.12")

Have them fold the strip to make a triangle, and tape the end to hold it together. Continue to demonstrate measuring, folding, and taping so that they make 5 polygons all together. Be sure to have plenty of extra paper strips on hand for mistakes. Once everyone has completed all the polygons, put students into groups of 4-5 to build structures of like polygons. Students can now tape the triangle-based shapes together, the square-based shapes together, the pentagons, hexagons, and octagons together. These are now "communities" of like-polygons. Have groups discuss the benefits/drawbacks of each structure in terms of how they fit together, strength of structure.

Can students conclude why bees build their hives using hexagons?