



# Busy, Busy Bees

## Studying Bee Behavior



### Summary/Purpose:

The following two activities allow younger students to understand why the honeycomb cells have six sides and how the bees find nectar and pollen.

**Grade Level:** 1<sup>st</sup> – 4<sup>th</sup> grade

**Time:** Two 30 minutes sessions (1 for each activity)

### Standards:

LS4 Biological Evolution: Unity and Diversity

### Materials:

- Circular object (such as a coin)
- Pencils, markers, and paper
- Lollipops or other treat

### Objectives:

Students will be able to explain why a honeycomb is built from hexagons  
Students will work in pair to explore the purpose of the ‘bee dance’

### Procedure for Activity 1: Honeycomb

<b>Introduction</b>	<ul style="list-style-type: none"><li>• Show students images of honeycomb built by bees.</li><li>• Distribute materials (coin, paper, markers or pencils) to students.</li></ul>
<b>Body</b>	<ul style="list-style-type: none"><li>• Using a coin or a larger round object, trace a circle in pencil in the middle of a piece of paper.</li><li>• Surround the circle with as many circles as possible with the edges touching (there should be six).</li><li>• Draw a point in the center of the empty triangular spaces between circles, and then connect the dots using markers and a straight edge.</li></ul>

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|  | <ul style="list-style-type: none"><li>• If the circles are erased, students can see that a pattern of hexagons is left. <i>This is the best space-saving design for a hive, The bees fit best through a circular shape, which must be connected to all others for efficient hive construction.</i></li><li>• An extended activity would be to create a bulletin board with larger construction paper hexagons—each student could write an insect or bee fact in their cell, and create a classroom hive.</li><li>•</li></ul> |
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## Procedure for Activity 2: Bee Dance

<b>Introduction</b>	<ul style="list-style-type: none"><li>• Show students a video of the bee dance if accessible</li><li>• Divide the class into two teams. Each team consists of partnered students. One will be the dancer and one will be the worker.</li></ul>
<b>Body</b>	<ul style="list-style-type: none"><li>• While all the workers hide their eyes, the dancers hide lollipops.</li><li>• 3. Each dancer dances for his or her partner to act out the location of the lollipop. This is a version of charades in which a lollipop hidden near an easel could be indicated by painting motions, or one hidden in the bookshelf could be indicated by pretending to read. Directions can be communicated by tilting the head, and when the worker is getting closer, buzzing and movement should get more and more energetic. Constant buzzing is advised.</li><li>• 4. In a large space (outdoors), both teams may go at once, and whoever finishes first wins. Inside, in a smaller space, the teams may go separately and be timed. After the first round, the workers and the dancers switch jobs and repeat the game.</li></ul>
<b>Closure</b>	<ul style="list-style-type: none"><li>• Discuss the importance of both the bee dance and honeycomb structure to bees. How are they related? What would happen without them?</li></ul>

NOTES



**Key Vocabulary:**

Colonies  
Drones  
Queen  
Workers  
Bee dance  
Honeycomb  
hexagonal

**Assessment possibilities:**

**Activity 1:** For younger children- Hold a class discussion about the benefits of hexagonal honeycomb structure. Evaluate student responses to check for understanding.

For older children- Write a paragraph explaining the reasons why honeycombs consist of hexagonal structures, and why they don't consist of other shapes

**Activity 2:** Either verbally or in written form, have the students list at least three pieces of information that bees communicate through their dancing. Possible answers include: location of food source; direction to food source; distance to food source; odor/smell of food; quality of food source.

**Extensions:**

**Links to other lessons:**

**Background information:**

Bumblebees, honeybees and social wasps large **colonies**. They may make hives or nests in trees, on houses, or any other stable object. A honeybee colony contains three kinds of bees: a **queen**, who lays up to 1,000 eggs a day; a few hundred males called **drones** whose only function is to fertilize the queen; and up to 60,000 sterile female **workers**, who feed the larvae pollen and honey, build and repair the nest, and gather nectar and pollen from flowers. They also protect the queen from potential enemies, and feed and clean her. Humans have collected honey from beehives for thousands of years. Paintings from tombs in Egypt suggest that beekeepers have kept their own hives for 2,500 years.

The honeycomb is built by the worker bees. Glands located between the joints in their abdomen produce flakes of beeswax, which the bees shape and form to create the hexagonal cell walls. They are formed in sheets, or combs. Filled yellow cells contain the pupae, while white cells contain honey for feeding the developing pupae (and hungry humans). Cells that are a lighter yellow contain pollen stores. What shape are the cells? Is this always the case? Why are they this shape?

**Background:** Worker bees fan out in all directions to find new sources of nectar for the colony. Once it is found, the other bees must be alerted. The bees have an intricate form of communication called a dance. If the nectar is nearby, they waggle their bodies energetically. If it is farther away, the angle of the bee's body tells the direction of the food. Several of the dances are recognizably repeated movements, such as the figure-eight dance. After the dance, the bee flies back and forth between the hive and the food hundreds of times as fast as it can. This is where the term **beeline** comes from.