

## The Beeman – Third Grade

### Purpose

Students will gain information from the text, *The Beeman* written by Laurie Krebs and Valeria Cis about the amazing and complex life of bees, how they help pollinate plants and how honey is collected by beekeepers for us to eat.

### Subject Area(s)

English Language Arts, Math, and Science

### Common Core/Essential Standards

#### ELA

##### ▪ CCSS.ELA-LITERACY.RL.3.1

Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

#### Math

- 3.G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

#### Science

- 3.L.2.2 Explain how environmental conditions determine how well plants survive and grow.
- 3.L.2.3 Summarize the distinct stages of the life cycle of seed plants

### Agricultural Literacy Outcomes

#### Agriculture and the Environment

- Recognize the natural resources used in agricultural practices to produce food, feed, clothing, landscaping plants, and fuel (e.g., soil, water, air, plants, animals, and minerals).

#### Science, Technology, Engineering & Math

- Provide examples of science being applied in farming for food, clothing, and shelter products.

#### Culture, Society, Economy & Geography

- Explain the value of agriculture and how it is important in daily life.

## Essential Questions

1. Why are honeybees useful insects?
2. How do bees pollinate flowers?
3. How do honeybees communicate to one another about their location?
4. What are the stages of a bee's life cycle?
5. What are the basics to beekeeping?
6. How do honeybees help farmers?

## Vocabulary

**Bees:** honeybees belong to the insect family

**Bee Colonies:** a large group of honeybees that live together

**Drone Bees:** male bees with huge black eyes and plump bodies

**Queen Bee:** has a long slender body and largest of the bees. She is the mother to them all and her job is to lay eggs

**Worker Bees:** female bees with many different jobs

**Beekeepers:** take care of the colonies and harvest the hives' extra honey

**Hives:** Beekeeper's hives are the boxes where the colony lives, raises its young and stores its honey and pollen

**Honeycomb Cells:** the cluster of wax cells built onto frames by the bees to hold eggs, larvae, pupae, honey or pollen

**Honey:** a sweet food made by bees using the nectar from flowers

**Pollination:** transfer of pollen from flower to flower by bees (or other insects)

**Bee dancing:** a form of communication between the bees that leads them to flowers

## Student Motivator

Begin a discussion with students about bees. *What do you know about bees? How can bees help us? What kind of food do honeybees make? Have you ever seen a beekeeper? What is the job of a beekeeper? How do honeybees help farmers?*

Show the following [video](#) to the students and discuss interesting facts the students observed. Record the facts on chart paper and use as a visual when engaged in the lesson activities.

## Background Knowledge

Honeybees have long played an important role in North Carolina's agricultural economy. Vital as pollinators of several major cash crops in the state (especially cotton, alfalfa, fruits, and vegetables) and useful for their production of honey and wax, European honeybees (*Apis mellifera*) have been a staple of farm life and folk culture for over three centuries.

There are 20000 different species of bees in Hymenoptera but only 7 species are recognized as honeybees. Originally found only in Europe, honeybees are now naturalized worldwide. They were domesticated over 200 years ago in the United States for honey production and pollination. Farmers actually rented colonies of bees to pollinate their crops. Even though other insects pollinate crops too, honeybees are one of the few that are synchronized and managed with the development of crops. If honeybees didn't pollinate, crops wouldn't be able to grow. Without the pollination from the honeybees there would be one third less crops in the world than there is now.

One pound (.45 kg) of honey equals the life work of approximately 300 bees and a flight distance of two to three times around the earth! Honey tastes different depending on the type of flowers the bee visits! Honey is made from a combination of nectar and bee saliva (consisting of enzymes). Honeybees must visit between 100 and 1500 flowers in order to fill their honey stomachs. The honey we eat is nectar that bees have repeatedly regurgitated and dehydrated.

The book, *The Beeman* written by Laurie Krebs and Valerie Cis is all about bees. *The Beeman* is a sweet story of a boy and his grandfather who is a beekeeper. The story teaches students about the amazing and complex life of bees, how they help pollinate plants, and how honey is collected by beekeepers for us to eat. The book begins with the grandfather putting on his beekeeper suit and takes you along the journey step by step until the honey is collected and the boy's grandmother makes apple and honey muffins. Students will become "experts" as they learn the essential facts about honeybees and of course—honey in a way which young students can relate to and not be fearful of the insect.

## Materials

- *The Beeman* by Laurie Krebs and Valeria Cis
- Bee Anchor Chart (Plain chart paper to write facts about bees)
- Hexagon Shape Booklet
- Bee Labeling Sheet
- Beehive Picture
- "All About Bees" Writing Paper
- Markers/paint/crayons
- Construction paper (white, black, yellow)
- Pre-cut flower
- Cheese puffs
- Pattern blocks

## Procedures

### Activity 1

1. Introduce the book, *The Beeman* written by Laurie Krebs and Valeria Cis and read aloud.

2. Show and discuss with students the vocabulary and have students tell what they think each word means.
3. Read the book to the class, discussing the many text features and pictures as you read.
4. Create an anchor chart using chart paper with the students about honeybee facts. Record the students answers on the anchor chart or on the *Bee Facts Cards* and stick to chart.
5. Students will use the *Hexagon Shape Booklet* to create a “BEE-lieve” facts booklet. On each hexagon, have students write a fact learned from the book. Students may use the anchor chart for help. Illustrate the hexagons to match the sentence.
6. Place students in groups to read each of the facts.
7. Next, have the students share as many facts as they learned without repeating one. The teacher can also record these facts on the anchor chart for further reference.

### Activity 2

1. Review the facts that students learned about bees from the chart paper. Show then the picture of the *Honeybees Diagram* with labels. Remind students that labels identify certain parts of a picture or diagram for the reader.
2. Discuss the fact that bees are insects and have 3 body parts: head, thorax, and abdomen. Call students up to identify the labels on the picture.
3. Students will write a story called *All About Bees* based on the information they have learned.
4. Students will create a bee to display with the writing. Students can use yellow and black construction paper or draw the bee with markers or crayons.
5. Have students color or paint the *beehive* and cut it out.
6. Attach the student’s writing *All About Bees* to the beehive and decorate it with their bee. Display student’s work in the classroom or on a bulletin board.

### Activity 3

1. In this activity, students will learn about pollination.
2. Review and discuss the page in the book about pollination. Ask students what they may know about pollination.
3. Show the video from <http://kids.sandiegozoo.org/animals/insects/bee> and point out that the bee in the last picture is collecting nectar from the flower and in the process the bee is pollinating the flowers.
4. Give each student a precut flower for his or her desk.
5. Give each student a handful of Cheese Puffs on a napkin at his or her desk.

6. Tell the students, *we will be doing an activity that will give us a simple example of how pollination works using things we are familiar with.*
7. Instruct students to start at his/her desk and eat 1 cheese puff (pollen). Their hands represent the bees. **DO NOT WIPE OR LICK FINGERS.**
8. Then have students “fly” to another student’s desk and put their fingerprint on the flower on that desk. Their fingers represent the bees’ legs. Allow students to do this several times, observing how the bees are pollinating each flower that they fly to.
9. When students have ‘flown’ to enough flowers to represent pollination on the flowers, allow them to finish their cheese puffs and come together as a group.
10. Discuss what happened and what each item represented.
11. Have students draw a picture of what each item represented and share their drawings with classmates. (Cheese puffs – pollen, Flower-pollen that was collected, Fingers-honeybees’ legs, Hand-honeybees flying).

#### **Activity 4**

1. Show students a variety of different shapes, including a hexagon. Ask the students to name each shape as a review.
2. Explain to students that the cells of a honeycomb are the shape of a hexagon. *If worker bees had a favorite shape, surely it would be the hexagon. After all, they build thousands of six sided cells! How many sides does a hexagon have?*
3. Draw a hexagon on the board and explain that each cell of a honeycomb has six sides and vertices.
4. Divide students into small groups. Give each group crayons, paper and these pattern blocks: two trapezoids, three rhombuses, and six triangles. Display illustrations of the shapes for student reference.
5. Challenge each group to identify four pattern block combinations that form a hexagon. When a group identifies a combination, each student records it on a page on their paper by coloring tracings of the pattern blocks.
6. Allow students to share their hexagon creations with the other groups.

#### **Discussion Questions**

1. What are the three types of honeybees?
2. Explain the jobs of the different types of bees: drone, worker bees, queen.
3. Identify the body parts of a bee (insect).
4. Explain how bees help farmers.
5. How do bees communicate with one another? Why?

6. Why do the beekeepers wear a protective suit?
7. What are some of the uses of honey?

### **Suggested Companion Resources**

- Sid the Science Kid: The Bee Dance  
[http://pbskids.org/video/?category=Sid%20the%20Science%20Kid&pid=p8\\_CN72lqw2\\_KY8Wxv5iuMDUWM9m692Fa](http://pbskids.org/video/?category=Sid%20the%20Science%20Kid&pid=p8_CN72lqw2_KY8Wxv5iuMDUWM9m692Fa)
- Bees and Beehives  
[http://currspec.appstate.edu/sites/currspec.appstate.edu/files/CI-5850%20Unit%20Plans%20Bee-Unit\\_Plan.pdf](http://currspec.appstate.edu/sites/currspec.appstate.edu/files/CI-5850%20Unit%20Plans%20Bee-Unit_Plan.pdf)
- Bee Facts for Kids  
<http://kids.sandiegozoo.org/animals/insects/bees>
- Bee: Ag Mag  
<http://www.agfoundation.org/recommended-pubs/bee-ag-mag>

### **Essential Files**

- [\*All About Bees Student Writing Paper\*](#)
- [\*Beehive Sheet for Craft/Writing Activity\*](#)
- [\*Hexagon Shape Booklet\*](#)
- [\*Bees – Informative Text Sheet with Labels\*](#)
- [\*Bee Facts Cards\*](#)
- [\*Precut Flower Template\*](#)

### **Essential Links**

- Bee Pollination  
<http://kids.sandiegozoo.org/animals/insects/bee>
- Learn About Bees  
<http://www.sciencekids.co.nz/videos/animals/bees.html>
- Sid the Science Kid: The Bee Dance  
[http://pbskids.org/video/?category=Sid%20the%20Science%20Kid&pid=p8\\_CN72lqw2\\_KY8Wxv5iuMDUWM9m692Fa](http://pbskids.org/video/?category=Sid%20the%20Science%20Kid&pid=p8_CN72lqw2_KY8Wxv5iuMDUWM9m692Fa)

### **Ag Facts**

- Honeybees are pollinators for flowers, fruits and vegetables.
- Honeybees live in hives and are divided into three types: Queen, Drone, Workers

- If the queen bee dies, the worker bees will create a new queen by selecting a young larvae. They will feed it a special food called “royal jelly.”
- Honeybees are excellent flyers. They fly 25 km/hr and can flap their wings 200 times per second.
- The average worker bee lives for just five to six weeks. During this time, she will produce about a twelfth teaspoon of honey.
- The queen can live up to 5 years.
- During the summer months the queen can lay up to 2,500 eggs a day.

### Extension Activities

**The Bee Dance:** Ask students: *Did you know that honeybees dance? Well, they do and their dance tells the other worker bees where nectar is found and how to get there.* If food is close by, they do a ROUND dance, running in circles, first one way and then the other. This allows the other bees to smell and taste what they have found. The faster they dance, the more nectar they will find. If food is further away from the hive, they will do a WIGWAG dance. The longer they waggle, the longer the trip will be. Making a half circle in one direction, they turn in one direction, then the other and waggle in a straight line. This tells the worker bees which direction they should fly. Show the students the video from **Sid the Science Kid** that shows the students how it works

[http://pbskids.org/video/?category=Sid%20the%20Science%20Kid&pid=p8\\_CN72lqw2KY8Wxv5iuMDUWM9m692Fa](http://pbskids.org/video/?category=Sid%20the%20Science%20Kid&pid=p8_CN72lqw2KY8Wxv5iuMDUWM9m692Fa) . Then have students work in groups to hide a flower and “dance” for the other group until they can find the hidden flower.

**Honeybee Hexagon Rhymes:** Have students locate the rhyming words in the book. Have them name other words that rhyme with that spelling pattern. After practicing together, give students the *Honeycomb Shape Booklet*. Place a word family in the center hexagon and have students write a corresponding rhyming word on the cells along the honeycomb. Students may cut the sides of the hexagon so that they all fold inward.

### Sources & Credits

- <http://www.sciencekids.co.nz/videos/animals/bees.html>
- [https://www.google.com/search?q=beehive+clipart&espv=2&biw=1280&bih=615&source=lnms&tbm=isch&sa=X&ved=0CAYQ\\_AUoAWoVChMIpYHF3PCPwIVCvGACH0dDwTP#tbm=isch&q=beehive+clipart+black+and+white&imgc=Eke-KVeL32ElhM%3A](https://www.google.com/search?q=beehive+clipart&espv=2&biw=1280&bih=615&source=lnms&tbm=isch&sa=X&ved=0CAYQ_AUoAWoVChMIpYHF3PCPwIVCvGACH0dDwTP#tbm=isch&q=beehive+clipart+black+and+white&imgc=Eke-KVeL32ElhM%3A)
- <http://www.clipartpanda.com/categories/bee-clipart-black-and-white>
- [http://pbskids.org/video/?category=Sid%20the%20Science%20Kid&pid=p8\\_CN72lqw2KY8Wxv5iuMDUWM9m692Fa](http://pbskids.org/video/?category=Sid%20the%20Science%20Kid&pid=p8_CN72lqw2KY8Wxv5iuMDUWM9m692Fa)

- [http://currspec.appstate.edu/sites/currspec.appstate.edu/files/CI-5850%20Unit%20Plans%20Bee-Unit\\_Plan.pdf](http://currspec.appstate.edu/sites/currspec.appstate.edu/files/CI-5850%20Unit%20Plans%20Bee-Unit_Plan.pdf)
- <http://ncpedia.org/symbols/insect>
- [https://www.google.com/search?q=flower+clip+art&espv=2&biw=1280&bih=576&source=lnms&tbm=isch&sa=X&ved=0CAYQ\\_AUoAWoVChMIkJWUo\\_GSxwIVhnU-Ch0IHg7N#tbm=isch&q=flower+clip+art+black+and+white&imgc=8p76eNzmrUN4QM%3A](https://www.google.com/search?q=flower+clip+art&espv=2&biw=1280&bih=576&source=lnms&tbm=isch&sa=X&ved=0CAYQ_AUoAWoVChMIkJWUo_GSxwIVhnU-Ch0IHg7N#tbm=isch&q=flower+clip+art+black+and+white&imgc=8p76eNzmrUN4QM%3A)
- <http://arts.unco.edu/ciae/institute/nicole%20bickford-%20butterfly%20pavilion/honey%20bee%20background.pdf>