

A Day in the Life of ...

Grade Level: 4-8

Lesson Overview

What's the buzz about bees? Students will investigate the three types of honey bees in a colony, identify their roles, and recognize honey bees as part of a community that works together.

Student Objectives

1. Interpret information from reading or video materials to produce a written composition.
2. Compose a journal entry related to bees and/or the bee-keeping industry.

Materials

- ✓ The Life and Times of the Honeybee by Charles Micucci ISBN 978-0395861394
- ✓ The Honey Files: A Bee's Life; video
 - <https://agclassroomstore.com/the-honey-files-a-bees-life/> (To purchase)
 - <https://www.youtube.com/watch?v=VZV8Jq3ka4s&feature=youtu.be>
- ✓ Bee Wise Information Sheet (optional)
- ✓ Bee Word-Wise Worksheet (optional)

Background Information

See Bee Wise Information Sheet

Procedure

Using the book:

1. Explain to students that the book, The Life and Times of the Honeybee, by Charles Micucci, presents facts about bees within and outside the hive. Physical characteristics, division of labor, role in pollination, year-round bee activities, the job of the beekeeper and the ways honey has been used throughout history are included in the book.
2. Instruct students to read the book. After the reading is complete, students (in groups or individually) should write one of the following journal entries:

A Day in the Life of a Worker Bee

A Day in the Life of a Drone

A Day in the Life of a Queen Bee A Day in the Life of a Beekeeper

Entries can include any/all of the following details (dependent upon age and skill level of students):

Anatomical characteristics of a honey bee	Pollination
Honey bee life stages	Beekeeping as a career
Honey bee society	Beekeepers' equipment
Honey bee duties	History of honey
Honey bee communication	Beeswax products
Honey bees' diets	Honey around the world
Honey bees' hives	Uses of honey

3. Allow opportunities for students to share journal entries with the rest of the class.

Using the video:

1. Show the class the video, [The Honey Files: A Bee's Life](#), from the National Honey Board.
2. Instruct students to write one of the following journal entries (either in groups or individually):

A Day in the Life of a Worker Bee

A Day in the Life of a Drone

A Day in the Life of a Queen Bee A Day in the Life of a Beekeeper

Entries can include any/all of the following details (dependent upon age and skill level of students):

Anatomical characteristics of a honey bee	Pollination
Honey bee life stages	Beekeeping as a career
Honey bee society	Beekeepers' equipment
Honey bee duties	History of honey
Honey bee communication	Beeswax products
Honey bees' diets	Honey around the world
Honey bees' hives	Uses of honey

3. Allow opportunities for students to share journal entries with the rest of the class.

Extension Activities

1. Allow students to refer to and use the Dadant Honey Bee Study prints (Life Cycle of the Honeybee) – these may be available from your local Ag Literacy Coordinator or can be purchased at www.dadant.com. The prints are 12 - 13" x 18" color enlargements depict various honey bee behavioral characteristics and beekeeping scenes. Printed on the back of each color photo is instructional material. It tells what can be observed and learned from the picture, asks questions, gives additional information on the subject and suggests other sources of information.
2. Students could create a comic strip or flip grid presentation as an alternative.
3. Question Cubes: Students may select a facet of the honeybee's life then create classroom question cubes. <https://pdst.ie/sites/default/files/Cube%20Creator-3.pdf>

Additional Resources

- Honey.com Educational Materials
<https://www.honey.com/the-bees/educational-materials>
- 10 Amazzzzing Bee Facts Poster
<http://www.todayifoundout.com/index.php/2010/12/10-amazzzzing-bee-facts-infographic/>
- Honeybee Anatomy Powerpoint
https://cdn.agclassroom.org/media/uploads/2015/01/20/Honey_Bee.pptx
- Anatomy of a Worker Bee Worksheet
<https://cdn.agclassroom.org/media/uploads/2015/01/20/AnatomyofaWorkerBee.pdf>
- Anatomy of a Worker Bee Answer Key
https://cdn.agclassroom.org/media/uploads/2015/01/20/AnatomyofaWorkerBee_Answers.pdf
- Pollinator Ag Mag (Interactive – Illinois Agriculture In The Classroom):
http://agintheclassroom.org/TeacherResources/AgMags/AITC440_W7%20Pollinator%20Ag%20Mag%20for%20Smartboard.pdf
- Pollinator Ag Reader (Illinois Agriculture In The Classroom):
http://agintheclassroom.org/TeacherResources/terra_nova_pollinator.shtml
- Bee Ag Mag (by American Farm Bureau Federation):
<https://www.agfoundation.org/recommended-pubs/bee-ag-mag>
- Flight of the Honey Bee by Raymond Huber ISBN 978-0763676483
- Honeybee by Candance Fleming ISBN 978-0823442850

Standards

Illinois English Language Arts Standard

W4 Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.

Illinois Social Science Standard

SS.G.2.6-8.LC Explain how humans and their environment affect one another.

The **M**ultidisciplinary **A**gricultural Integrated Curriculum (mAGic) was created in 2004 under the leadership of the Illinois State Board of Education (ISBE) and the Facilitating Coordination in Agricultural Education Project (FCAE). Funding was made available through the FCAE grant budget from the agricultural education line item of the ISBE budget. This revision, as printed, was developed in April 2021.



These mAGic lessons are designed to bring agriculture to life in your classroom. They address the Illinois Learning Standards in math, science, English language arts and social studies.

Insect mAGic project update writers/reviewers: Rhodora Collins – Dekalb County; Suzi Myers – Kane County; Connie Niemann – Montgomery County; Debbie Ruff – Livingston County; Jennifer Waters – Sangamon County; and Dawn Weinberg – Hancock County.

Bee Wise Information Sheet

Honey bees are extremely important to humans. Bees are pollinators. They collect pollen and nectar from flowering trees and plants and transfer pollen from flower to flower. Bees pollinate 95 different crops, helping to create nearly one-third of the world's food supply. Honey bees use the nectar they gather from flowers to make honey, which is the only commercial food produced by insects that is eaten by humans on a wide scale. Honey bees also produce beeswax, which is used to make candles, artists' materials, lubricants, polishes, and cosmetics. Bee venom, pollen, royal jelly, and propolis are other bee-made products used in manufacturing, and for nutritional and medical purposes.

Colony Life

Honey bees live in large groups called colonies. There are three types, or castes, of honey bees—queen, worker, and drone.

The **queen** bee is a female that lays eggs. Each colony has only one queen bee. The queen can live up to four years and can lay over one million eggs in her lifetime. She can lay close to one egg per minute and between 1,000-2,000 eggs a day.

Worker bees are female bees who perform many of the jobs for the colony, including feeding the larvae; cleaning the hive; creating wax and using it to make new cells; grooming and feeding the queen; guarding and protecting the hive; and leaving the hive to collect pollen, nectar, and water. Worker bees live for about six weeks in the summer and longer in the winter months when they are less active.

Drones are male bees responsible only for mating with the queen. They do not work. There are about 100 drones in each colony. They live for about eight weeks in the summer, and are then expelled from the colony and die in the fall.

Life Stages

Honey bees have four distinct life stages—egg, larva, pupa, and adult. Complete metamorphosis takes between 16 and 24 days.

The queen lays each **egg** into a different cell of the honeycomb. It is her job to determine whether the egg will grow into a male or female bee. Fertilized eggs will become female workers, and unfertilized eggs will become male drones. After three days, the egg hatches and a worm-like creature, called **larva**, is unveiled. Worker bees feed the larva royal jelly—a milky, yellow syrup secreted from a gland in the worker bee's head. As it grows, the larva sheds its skin four to five times. On about day nine, the larva spins itself a cocoon. A worker bee seals the cocoon into the cell with wax.

Inside the cocoon, the larva transforms into a **pupa**—developing eyes, legs, and wings. When the bee is fully grown, it chews its way out of the cell and emerges as an **adult**. It

honey bee vs. honeybee

Many dictionaries list "honeybee" as one word. Other sources use "honey bee," as two words. Which is correct?

While both are acceptable, entomologists prefer "honey bee" as the more accurate spelling.

takes 16 days for a queen bee to develop from an egg to an adult; worker bees take 18-22 days, and drones need 24 days.

Body Structure & Function

The size of a honey bee's body depends on its caste and the task it performs. The queen bee is the largest, and the worker bee is the smallest. Honey bees, like all insects, have three main body regions—head, thorax, and abdomen.



Image by Ivar Leidus via Wikimedia Commons

The **head** contains two compound eyes, three simple eyes, two antennae, mandibles, and the proboscis. The **compound eyes** are made up of thousands of tiny lenses that allow the bee to see ultraviolet light (invisible to the human eye) and all colors of visible light except red. The **simple eyes** each have a thick lens that can sense changes in brightness. The honey bee's **antennae** are movable feelers that detect smells and movement. The **proboscis** is a

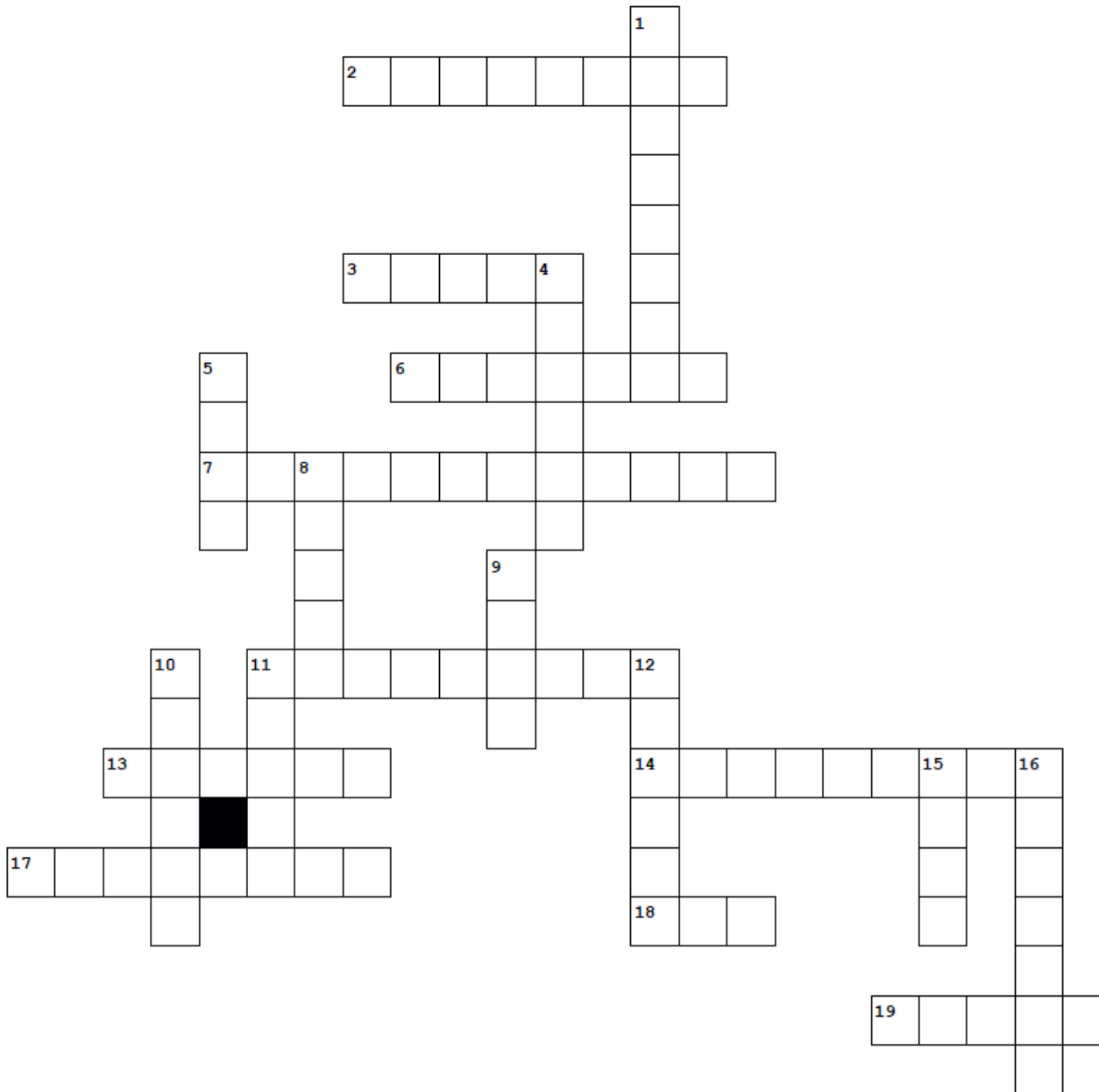
straw-like tongue used to suck nectar or honey. **Mandibles** are jaw-like structures used to knead wax and to chew honey and pollen.

The **thorax** is the honey bee's middle region containing the flight muscles, four wings, and six legs. Honey bees have two **hind wings** and two **forewings** that can beat 250 times per second allowing the bee to fly at speeds of up to 15 miles per hour. They have three pairs of segmented **legs** used for walking, dusting their antennae, brushing pollen off body hairs, and storing pollen. The hind legs of worker bees contain a **pollen basket**—a collection of hairs where pollen is stored for transport.

The **abdomen** is the rear region that contains organs for digestion, reproduction, and respiration as well as the stinger and wax glands. The **stinger** is only found in female honey bees. A worker bee's barbed stinger is used for defense. When stinging, the barb anchors the stinger in the victim while the stinger's pouch pumps venom. After stinging, the bee dies of an abdominal rupture. When stinging insects, the bee's stinger remains attached while the barb tears through the target's exoskeleton. The **honey sac** is a stomach-like organ connected to the digestive tract. The sac stores the nectar until the bee returns to the hive. **Wax glands** are located on the underside of the bee's abdomen. These glands form and excrete wax.

Adapted from "Honey Bees: A Pollination Simulation," retrieved from <https://agclassroom.org/matrix/lesson/84/>.

Bee Word-Wise Worksheet



Across

2. type of eye made up of thousands of tiny lenses; can see in color
3. the final phase of the honey bee life cycle
6. rear body region containing digestion, respiration, and reproduction organs, as well as the stinger and wax glands
7. collection of hairs where pollen is stored for transport (two words)
11. located on the underside of the abdomen; form and excrete wax (two words)
13. male bees responsible for mating with the queen
14. jaw-like structures used to knead wax and chew honey and pollen
17. stomach-like organ connected to the digestive tract
18. the beginning of the honey bee life cycle
19. female bee that lays eggs

Down

1. movable feelers that detect smell and movement
4. middle body region containing flight muscles, four wings, and six legs
5. develops from the larva inside the cocoon; this stage is when eyes, legs and wings develop
8. worm-like creature that hatches from the egg
9. contains two compound eyes, three simple eyes, two antennae, mandibles, and the proboscis
10. female bee that performs many of the jobs for the colony
11. can beat 250 times per second, allowing flight up to 15 mph
12. type of eye that has thick lenses that sense changes in brightness
15. three pairs of segmented structures used for walking, dusting the antennae, and storing pollen
16. only found on females; used for defense

Bee Word-Wise ANSWER KEY

