



Western Bumble Bee, USDA



Honey bees, James Ellis,
University of Florida, Bugwood

Grade: 3-6

Duration of Lesson: 2- 45 minute classes

Brief: Students will understand social or solitary nature of bees.

Materials:

Montana Pollinator Education Project Bee Identification cards

Montana Pollinator Education Project Poster

Additional pollinator posters from Montana Department of Agriculture if available, can also be seen at:

[Pollinator Posters](#)

Key Terms

Agriculture, social, solitary, eusocial, communal, nesting, hive, chamber, pollen, nectar, and habitat.

MONTANA COMMON CORE STANDARDS:

ELA 4. and 5. Reading Informational Text

4. Craft and Structure: Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.

ELA 6. Reading Informational Text

Craft and Structure: Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meaning.

ELA 3. -6. Writing

3. Text Types and Purposes: Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.

NGSS 3. Interdependent Relationships in Ecosystems

Disciplinary Core Ideas, LS2.D: Social Interactions and Group Behavior

Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size. (3-LS2-1)

NGSS MS. Growth, Development, and Reproduction of Organisms

Disciplinary Core Ideas, LS1.B:

Animals engage in characteristic behaviors that increase the odds of reproduction. (MS-LS1-4)

<u>Understanding(s) /Big Ideas:</u> Students will understand the difference between social and solitary bees.	<u>Essential Question(s):</u> Why are some bees social and other solitary? Are some bees both social and solitary?
<u>Students will know:</u> The nature of solitary and social bee colonies.	<u>Students will be able to:</u> Understand the reason bees might sting, and understand the nature of bee colonies.

Performance / Observations

<u>Performance Task(s):</u> Students will read informational text and create poetry based upon their reading.	<u>Other Evidence:</u>
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Learning / Inquiry Activities

Introduction

Solitary Bees

Bees that are solitary nesters build their nests as a single unit; the females construct the nests. The purpose of the nest is to receive the eggs she lays and to provide an area for her eggs to mature into bees. The nests may in the same area as other bees of her type, but she alone enters her nest. Over 90% of bees are solitary nesters.

The solitary female bee prepares her nest by first locating the type of nesting area she prefers. For the Bumble bee this may be an old rodent’s nest in the ground, an old bird’s nest, or in some matted grasses. Bees like the Digger bee dig holes in the ground for their nests, and often many females will dig nests in the same area because it is a prime nesting area. The Leafcutter bee cuts semi-circles from a leaf for nesting; she will fly with the semi-circles in her mouth and take the piece of leaf to a crevice where she will roll the leaf pieces into the chamber. A few species use a common hole into the ground, but once

inside each female has her own chamber for nesting. Some bees will line their nest with materials which keep out moisture and bacteria.

After the female has her nest prepared she will begin to lay eggs and provide pollen and nectar for the larvae so they have food once they hatch. Often times the bees will only lay one egg and then close that chamber before creating another chamber for one more egg.

Since solitary bees don't have a large nest holding all of their young and food supplies, they do not have the need to defend their nest. Bees that do have large nests where they all congregate (social bees) are defensive of their nests. The nesting habits of solitary bees is mainly what makes them less likely to sting, most of them will not sting unless they are trapped. Some of solitary bees like the Mining bee nest in lawns in large numbers but their stingers are too weak to penetrate human skin.

Social Bees

Social bees live together in colonies which have at least two adult females, but possible more. In order to be considered truly social, a bee colony must consist of a female that lays the eggs and worker bees that feed and care for the young. The worker bees will not reproduce their own offspring. Honey bees are an example of a social bee, paper wasps are also social. For social bees all of the young and food supplies are held in one big nest, you could say they have all their eggs in one basket. Because of this, social bees tend to be very defensive of their nests, making them much more likely to sting if they sense any danger to their nest.

Eusocial Bees

Not all bees fit into the categories of solitary or social nester, some bees are a mix of both. Eusocial bees are those that have several generations living in the same cavity at one time, or caring for offspring that are not their own. One eusocial bee that lives in Montana is the Bumble bee. The female bumble bee may nest over the winter with other females so at that time she is social. When she is laying eggs she has her own nest, which makes her solitary at that time.

Student Activity - Poetry

After teaching the material above ask students to examine the Montana Pollinator Education Project cards and read each bee card that has a social or solitary nester label on front. Ask the students to write a poem, reflecting what they learned from the lesson.

Example:

The Swarm of Bees

Elsa Gorham Baker

One little honeybee by my window flew;
Soon came another - then there were two.
Two happy honeybees in the appletree;
One more bee came buzzing up - then there were three.
Three busy honeybees starting to explore
Another bee came to help - then there were four.
Four laden honeybees flying to the hive;
<http://agr.mt.gov/agr/f> They were joined by one more bee - then there were five.
Five tired honeybees with the others mix;
Now there's a swarm of them - a hundred times six.

