Build a Wild Bee Nest

Grade Level
2nd grade– 12th Grade

Lesson Length
10 min intro. 30- 45 minute activity

STEM Careers
- Entomologist
- Engineer
- Teacher
- Zoologist
- Conservation Biologist

This lesson is part of the Pollinator Curriculum. These lessons can be adapted for use with a variety of ages.

Learning Objectives

By the end of the lesson, students should be able to:
- identify two different ways bees nest in the wild.
- identify three ways that they can help declining bee populations at home.
- use tools to construct a solitary bee nest;

Educational Standards Supported

(Nebraska Early Learning Guidelines)

- CA.02 Develops foundational skills that support creative expression through the process, production, and appreciation of visual art forms
- FA 2.2.1 Students will use the creative process to make works of art with a variety of materials
- SC.3.7.2.C Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

Materials List

- Each child must have:
  - a hammer
  - 10-15 nails, make sure to account for bent and faulty nails
  - labeled roof piece
  - labeled bottom piece
  - labeled back piece
  - two labeled side pieces
  - hollow sticks or paper straws for nesting materials
- newspaper or other covering for the craft area
- paints, stickers, materials for decorating the bee nest
- brushes
- paper towels
- cups of water for washing brushes out if necessary

- paper plates
- nesting materials (tubes see supporting materials powerpoint)

Lesson

Opening Questions

- *What are wild bees versus managed bees?*
- *What kind of nests do bees make?*
- *Why do we need wild bees?*
- *How do we protect wild pollinators?*

Activity: Build a Wild Bee Nest

Setup

1. Stage the craft area using plenty of newspapers or disposable table coverings to protect working surfaces.
2. Provide each student with their own set of materials (Each child must list).
3. Stage the paints, brushes, paper plates, and cups of water to the side of the craft area until they are needed. The cups of water and paper plates can be shared between pairs of students.

Introduction

Bees are important creatures that pollinate many of the fruits, vegetables, and nuts that we eat. There are over 4,000 different species of bees in North America.The bee that most of us think of right away is usually the honey bee that lives ***socially*** in a large colony with 30,000 to 50,000 nestmates. These pollinators are cared for by beekeepers and placed onto farms for pollination of crops. However, there are so many more types of bees out there, most of which live as ***solitary*** bees! Each species of bee has their own preferred environment for nesting and raising their young. There are two types of solitary nesting bees; ground nesting and cavity nesting. **Ground nesting** bees need access to bare soil to nest in and include bees like squash bees and mason bees. Females of these species create a small network of tunnels or occupy

Glossary words:

Cavity nesting - bees that nest in either self-created or already existing cavities

Ground nesting - bees that nest in the ground, usually in patches of bare earth

Larval - referring to the second worm-like stage of the immature bee

Managed bees - purposefully cared for and moved by humans for crop pollination.

Nectar - a sweet liquid produced by plants and used by bees in making honey; source of sugar

Nest- shelters where food may be stored and young are raised

Pollen - the very fine usually yellow

abandoned holes in the ground. As individuals, they create chambers where they collect resources, provision each tunnel chamber with a small amount of pollen, and lay one or a few eggs on each pollen store. These eggs are left to hatch into larval bees, eat the provisioned pollen, and develop. **Cavity nesting** bees nest in existing cavities like hollow twigs, stems, or self-excavated tunnels in wood. Cavity nesters include leaf cutter bees and carpenter bees. Each female mother bee finds a hollow stem and will lay 3-5 female eggs in the very back of the cavity. She will give each egg a food source containing a mixture of **pollen** and **nectar**, and then partition or separate each chamber with little pieces of chewed leaves. Then she will do the same at the front of the hole with male eggs. The nest that we are making today will house these cavity nesting bees.

Instructions

1. Double check that each student has all of the necessary materials.
2. For complete instructions see how-to video link in “supporting materials” section below.
   Start with the back and one side. Demonstrate how to line up the sides with the pre-drilled holes. Be prepared for different levels of skill with hammers and nails within each age group of students. Also be prepared to give out extra nails or sides if someone makes a mistake and bends a nail or splits a piece of wood.
3. Next, attach the second side to the back.
4. Then attach the roof. Make sure that students understand the large hole on the back needs to go closest to the roof.
5. Finally nail on the bottom and allow the students to decorate their bee nest. Allow nests to dry before filling with nesting materials and allowing students to take them home.

Post Activity Discussion

1. Discuss how nesting habitat affects bee populations.
2. Talk about plant diversity and the need for different pollinators.

dust that is produced by a plant and that is carried to other plants of the same kind usually by wind or insects so that the plants can produce seeds; protein source; contains genetic code of plant

Pollination - to give (a plant) pollen from another plant of the same kind so that seeds will be produced

Pollinator – animals that help pollinate flowers and plants

Social - one female is reproductive while other non reproductive bees are in charge of foraging for resources

Solitary- an individual female is in charge of raising brood and foraging for resources

Wild bees– bees that are naturally in an area without the influence of humans

3. Have students match the different bees to their different types of cappings. Count the cappings of the different bees on the “Be a bee scientist” slide.

4. Ask if there are any other questions, quiz the students on information they learned during the introduction presentation.

What you can do to help

1. Plant native species with various seasons.

2. Don’t use chemicals (insecticide, fungicides or herbicides).

3. Prevent invasive species.

Elaborate/Extend

Ask children to explain their design ideas and how it will benefit the wild bees that will be living there. Are there blue markings to help the bees orientate? Is it camouflage so predators can’t see it as well? Have the students explain their reasoning.

Evaluate/Reflect

- *What should we include in pollinator habitat?*
- *How do we create nesting spaces for bees?*
- *Why is having a variety of bees important?*

We want to hear from you!

Let us know what you thought of the lesson or send us a picture of youth participating in the lesson. Please send feedback **entomology@unl.edu**!

County Fair Project:
Build your wild bee nest from scratch with the measurements and blueprints from the supporting materials. Enter it in beginning woodworking as a nesting box for bees.

Supporting Lesson Materials

- https://drive.google.com/drive/folders/1sDvWc7W2mw_rmjW1QIfil0RN0YxzsCu-?usp=sharing
  - View only - Make a copy of the folder and then print or edit as necessary
- How-to video link: https://youtu.be/PY_YJN9H6CM

- Different kinds of bees video: https://youtu.be/tylYguci9o4

References/Resources:

- Building and managing bee hotels for wild bees https://pollinators.msu.edu/publications/building-and-managing-bee-hotels-for-wild-bees/
- www.fws.gov/pollinators
- Learner's Dictionary - http://learnersdictionary.com/
- https://www.npwrc.usgs.gov/pollinator/home
- Xerces Society - https://xerces.org/
- Nebraska Science Standards Guideline https://www.education.ne.gov/wp-content/uploads/2017/07/Nebraska_Science_Standards_Final_9-8-17.pdf

Suggested Children's Books:

- Gibbons, Gail. (1997).*The Honey Makers.* Singapore: Tien Wah Press.
- Allen, J. (2000). *Are you a bee?* Boston, MA: Kingfisher.
- Dr. Felicity Muth (2022) Am I Even a Bee? Baobab Press
- Barton, B. (2017). *Give bees a chance.* New York, NY: Viking.
- Milner, C. (2018). *The bee book*. New York, NY: DK Publishing.
- Slade, S. (2010). *What if there were no bees?* Mankato, MN: Picture Window Books.

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