Mason Bees

Illinois Extension
UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

Grades: K-5
Expected Completion Timeframe:

Objectives
1. Teach children about the importance of protecting pollinators
2. Learn about native bees
3. Make and take home their own mason Bee House

Background/Discussion
1. *Today we are going to talk about bees. Can you name any kind of bees?* (honey, bumble, mason, carpenter, sweat, etc.)
2. *Today we going to learn about the mason bees. They are very gentle bees- they don't sting and they don't make honey. They are great pollinators though by visiting all kinds of flowers and helping plants make fruit.*
3. Show a picture of a mason bee. *What do you notice about it? How does it look?* (black/blue, fuzzy)
4. *The fuzziness is really important. Why do you think it's important?* (all the pollen sticks to it)
5. *Mason bees are excellent pollinators because they are so messy! The pollen sticks all over their bodies and then some of it falls off as they fly from flower to flower. They collect the pollen to bring back to the nest to feed their babies.*
6. *What do you think their nest looks like? Not like bird nests or a typical beehive. Mason bees lay their eggs in tunnels.* (show photo) *See in this photo, there is a pollen ball, egg, and then a wall that the bee makes out of the mud.*

Activity #1: Learn about Mason Bees

1. How the mason bee got its name
    a. Mason bees were named because they use mud or masonry products in building their nests. A mason is a worker who builds with stones using mud to hold together stones. Other materials mason bees use for their cells could be clay, grit, or chewed plant material.
    b. Their nests are made in narrow gaps such as between cracks in stones or other small dark spaces. They could use naturally occurring tubular cavities such as hollow stems or holes in wood made by wood-boring insects like beetles or carpenter bees. They might also nest in snail shells or under the bark.

2. What does a Mason Bee look like (Show picture)
    a. There are over 300 species of mason bees. Two native to the Americas are the Orchard Mason Bee and the Blueberry Bee.
    b. Colors: Metallic green or blue, or blackish, or rust-red
    c. An Orchard Mason Bee may appear black, but is actually a dark metallic greenish-blue color
        • They look a lot like common flies

- Female is ½ inch in length, while the male is thinner and shorter in length.
- Males have long antennae and light-colored hair on the front of their heads.
- Blue Orchard bees are pollinators for early spring plants and fruit trees. They fly fast and pollinate many flowers in a short time.

3. How are mason bees different from honey bees?
    a. Mason bees are solitary insects, unlike honey bees that live in a hive with other honey bees. While they live on their own, most nest close together.
    b. Every female is fertile and makes her own nest. There are no worker bees.
    c. They do not make honey or beeswax.
    d. Like honey bees, they collect nectar in a honey sack as they forage, eating it directly or saving for nest provisions. Unlike honey bees, they cannot store and carry pollen in the hind legs. Instead, pollen is collected by rows of stiff hairs on the abdomen. The pollen falls off on each flower they visit so they can pollinate about 2000 flowers a day, compared to the honey bee's 15 flowers a day.
    e. Mason bees are very docile and rarely sting when handled (only when under distress—wet or squeezed). The sting is small and not painful since the stinger is not barbed.

4. Lifecycle of a Mason Bee
    a. The male mason bees are the first to come out of their cocoons. The females mate with one or more males when they emerge. The males soon die and the females begin to gather provisions for their nests. Mason bees may be active from spring through late summer, depending on the species.
    b. The female finds a location for her nest and begins to visit flowers to gather pollen and nectar. She builds a pollen/nectar mass at the back of the nest. When the mass is completed, she lays an egg on top. Then she creates a wall of mud to close off the first egg cell.
    c. She repeats this process of collecting pollen/nectar, laying an egg on the mass, and ceiling of the cell with mud until she had filled the entire nest cavity. She lays female eggs in the back of the nest and male eggs in the front.
    d. Once she has finished the nest, she plugs the entrance to the tube to keep out pests. he may then look for another nest location.
    e. Within weeks of hatching from the egg, the larvae eat all its provisions (mass of pollen/nectar) and begin spinning a cocoon around itself to enter the pupal stage.
    f. The adult matures in the fall or winter and hibernates within its warm cocoon. Most mason bees are found where the temperature drops below freezing for a long duration of time and are well-adapted for cold winters. When the temperature is right, they emerge from their cocoon and begin to mate.

Activity 3: Mason Bee Relay

Materials:

- 4, 8 foot long sheets of paper (butcher paper rolls) with 8 flowers drawn on each (spaced apart length of sheet)
- Cupcakes liners (8 per sheet)
- Tempera paint powder
- Cotton balls (fuzzy bee body)
- Clay (mud)
- Black beans (eggs)
- Printed images: bees, nest cavities
- Long skinny tray or egg carton to simulate nest tubes

1. Set-Up: Tape the four paper sheets down to the floor, parallel to each other, spaced at least 2 feet apart. Draw 8 large flowers on the sheet, spaced apart- tape cupcake liner in the center of each flower, with 2 tablespoons of powdered tempera paint inside. Students will line up for the relay at one end of the paper sheet. At the other end of the paper sheet, place a table with 4 skinny trays (1 for each sheet of paper.) The skinny tray represents the mason bee's nesting cavity/tunnel. Mark lines on the tray where each mud wall should be built. Place piles of clay and beans (eggs) by each tray so that students can easily reach them.
2. Directions: Split the class into 4 groups. Students will line up at the 4 sheets of paper for the relay. Students visit each flower to gather pollen. They travel to the nest, lay the pollen ball, place the egg on the pollen ball, and build the wall (from clay). They then fly back and tap the next student on their team. The race can either be timed (X minutes, each student goes X times, etc) or be a race for completion (the team that fills their nest tunnel first wins.)

Activity #3: How to Make a Mason Bee House

Materials
- 1 can (Soup or Bean—beware of sharp edges)
- Mason Bee nest tubes: 6 inches with an opening diameter of 5/16 inch
- Wire or zip tie

Note: Longer tubes allow for more female bees to be laid, so it makes a difference how big a can you use (3-10 inches is the best range).

Construction:
1. Drill two holes in the sides of the can to run wire or zip tie through to hang.
2. Optional: May prime and paint outside of the can
3. Measure tubes to can and cut to length
4. Insert tubes with the cut end first into the can until snug
5. Place in your yard with the opening facing south/southeast to allow morning light to warm the house and encourage foraging. A height of 5-7 feet above the ground is preferred so you can watch bee activity. Replace tubes once hatched

Photo by T.Howard

CREDIT: Adapted from Benton Soil and Water Conservation District's Mason Bee Relay

Teacher Resources
https://pollinators.msu.edu/publications/building-and-managing-bee-hotels-for-wild-bees/
https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/em9130.pdf
Build a Bee House https://www.youtube.com/watch?v=m0re9o1ZqX8
Like Fruit? Thank a Bee https://www.youtube.com/watch?v=txv2k7OoY7U

Evaluation

High Five a Friend- everyone stands up, finds a buddy to high five. That's the person they share a fact they learned from today's lesson. They can repeat the High Five and fact sharing with several buddies. (K-2)

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mason bee

Joseph Berger, Bugwood.org

mason bee nesting cavities

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mason bee nest

Orangeaurochs via Flicker