



OBJECTIVE

Students will understand the ways insects communicate to survive in their environment

EDUCATIONAL STANDARDS

- DoDEA Science Standards (Animals 2Sb.1) Recall the basic needs of animals (including air, water, food, and shelter) for energy, growth, and protection.
- North Carolina Essential Science Standards (Ecosystems 1.L.1.1) Recognize that plants and animals need air, water, light (plants only), space, food and shelter and that these may be found in their environment.

LIFE SKILLS

Teamwork, learning to learn

WORDS TO KNOW

tybal, membrane

TIME NEEDED

30 minutes

MATERIALS

- Cotton balls
- Different Food Extracts (such as vanilla, orange, mint, almond, banana)
- Wax paper
- Paper towel rolls (cut in half) or toilet paper rolls
- Rubber bands



Figure 4-1. Monarchs have bright colors to warn predators not to eat them.

INTRODUCTION

Though they may not have cell phones like we do, insects are constantly communicating. Whether with complicated chemical detection systems, sound-making devices or flashy colors, insects communicate in a variety of ways. Monarch butterflies flash their bright orange wings to warn would-be predators that they make an unsavory meal, Figure 4-1.

Cicadas, crickets and katydids fill the summer air with their rattling calls, Figure 4-2. Ants lay chemical trails for their sisters to follow by smell. If insects were not able to communicate with each other (and with us!), many would not be able to eat, reproduce, find their nests or otherwise meet their essential needs.

In this lesson, you'll explore two ways insects communicate: scent and sound. For scent, participants will pretend to be ants and try to find their nestmates. In the wild, the ability to locate nestmates is essential for ant survival. If they wandered into the wrong nest, they might get attacked or eaten. They also need to find their sisters when looking for food or scaring away their enemies.



Figure 4-2. Cicadas snap their wings to make sounds to attract mates.



Figure 4-3. The antennae of an ant acts as a nose, smelling and sensing their environment

ACTIVITY 1: Find your family

Most ants have very bad vision and rely on smells to find their way around. Instead of having noses, ants have two antennae on their heads that they feel around with, sensing smells and textures Figure 4-3. We all know ants follow each other's scent to find food and their way back home. They also use scent to tell whether or not other insects they encounter are their nestmates. When an ant encounters another ant, she'll touch that ant all over with her antennae to see if the other ant smells like her. If she finds the other ant does smell like her, she may offer her a bite to eat, follow her home, or follow her to food. In this activity, participants will pretend to be ants and use smells to find each other's "nestmates."

1. Begin by facilitating a general discussion about smell. Ask the students to share some of the things they know by smell.
2. Explain how some animals, like ants, who can't see very well, use their sense of smell much more than we do.
3. Have them imagine what it would be like to greet each other by sniffing instead of just waving.
4. Give each student a cotton ball saturated with a little scent (such as orange, mint, vanilla, banana and almond extract.)
5. Let the students walk around and sniff each other's cotton balls until they find people who have the same-smelling balls as they do.
6. After the activity, ask the students what it was like to "see" each other with their noses.

TALK IT OVER

Share: How did smell help you find your "family members"? What would it be like to "see" with your nose?

Reflect: What are the different ways that insects use smells to survive? (find their nests, find a mate, alert nestmates to danger, food sources, etc)

Generalize: How do you use smell to communicate? How is that different or similar to how ants use smells to communicate?

Apply: How does having fun while learning, help you understand different ideas?

ACTIVITY 2: Bug Band

In this activity, students are encouraged to have fun with noise production.

1. Have the students list the ways they experience their environment through their five senses: touch, taste, smell, sound and sight.
2. Then contrast the way they use their human senses with the way insects use their senses. Ask students, “how do insects use sound to communicate?”
 - Explain how cicadas make loud noises to call to each other at night using something called a “tymbal,” (pronounced tim-boll) which works like a rubber band slapped against a drum. Crickets, grasshoppers and katydids use a file and scraper on their wings or legs, which work like a pencil being dragged across a comb. Some beetles squeak to each other by rubbing their hairy bottoms against their wings
3. Lay out wax paper, paper towel rolls (cut in half), and rubber bands.
4. Help your students place squares of wax paper over the open ends of the paper towel roll and wrap rubber bands around the roll to secure the wax paper.
5. Then show them how to wrap a third rubber band from one end of the roll to the other.
6. They should feel the vibrations of the rubber band slapping the paper towel roll and wax paper with their fingers, as well as listen to the sounds it produces Figure 4-4.

They could experiment with layering wax paper or trying another “membrane” besides wax paper, like regular paper, felt or tin foil, using more than one rubber band, closing their hand on the roll to reduce reverberation, or other ideas they may have. They should call to each other with their instruments in their buggy band.



Figure 4-4. Slap the rubber bands to make a vibration sounds like a cicada.

TALK IT OVER

Share: How did sound help you find your “family members”? How do insects use sound in their everyday lives?

Reflect: What other animals use sound to communicate? What are they communicating?

Generalize: How do you use sound to communicate?

Apply: How do you use sound in other ways in your life? How do different sounds make you feel?



TOOL KIT

wax paper

paper towel rolls

rubber bands

All you have to do is step outside to know insects communicate all the time. From the chirp chirps of crickets to ants following each other in trails, insects stay in constant contact using the same senses we use: touch, taste, smell, sound and sight Figure 4-5. For examples, cicadas make loud noises to call to each other at night using something called a “tymbal,” (pronounced tim-boll) which works like a rubber band slapped against a drum. In this activity you will build your own cicada tymbal to communicate with your buggy friends.

INSTRUCTIONS

- 1 Place squares of wax paper over the open ends of your half paper towel roll.
- 2 Wrap rubber bands around your roll to secure the wax paper, one on each end.
- 3 Wrap another rubber band from one end of the roll to the other.
- 4 Snap the rubber band against the paper to make a sound.



TALK IT OVER

- Share: How did sound help you find your “family members”? How do insects use sound in their everyday lives?
- Reflect: What other animals use sound to communicate? What are they communicating?
- Generalize: How do you use sound to communicate?
- Apply: How do you use sound in other ways in your life? How do different sounds make you feel?



Cicadas snap their wings to make sounds to attract mates.

Did You Know:

A single cicada can produce a sound that can be heard from more than a half a mile in any direction