



INSECT SOUNDS IN THEIR ENVIRONMENT

THEME

- Forest Health
- Ecology
- Plant Conservation

TYPE OF LESSON

- Instructor-Led
- Hands-On
- Garden Exploration

POSSIBLE WAYS TO LEAD LESSON

- Outdoors
- Virtual
- Classroom
- Other:

TEACHING STRATEGY

- Place-Based Learning
- Storytelling
- Nature Play
- Art / Movement
- Other: Auditory learning

STANDARDS

- **NGSS, 4-LS1-1: From Molecules to Organisms.** Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
- **NGSS, 4-LS1-2: From Molecules to Organisms.** Use a model to describe how animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

GRADES 3–4

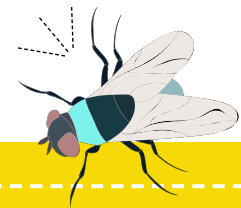
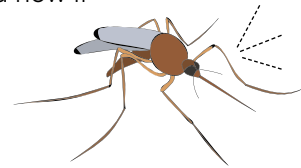
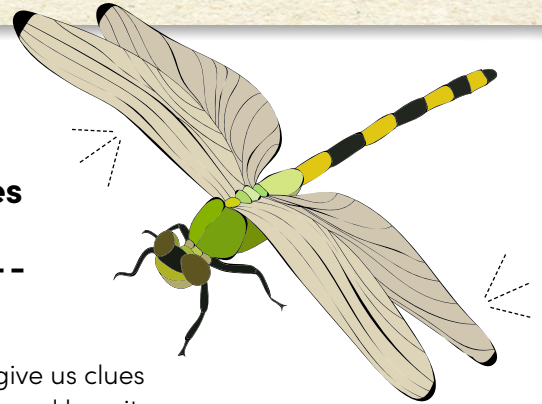
DURATION 60 minutes

LESSON GOAL

Learners explore how sounds give us clues about what an animal is doing and how it is interacting with its environment.

LESSON SUMMARY

Learners listen to and explore sounds that insects make. They use those sounds as clues to understand what the insects are doing as they interact with their environments and consider how these behaviors help the insects live.



WORD BANK

ecosystem: a collection of living organisms (such as plants, animals, and fungi) and the environment they live in

behaviors: things organisms do in response to their environment

environment: the surroundings an organism lives in, including things like water, soil, air, climate, and other organisms





INSECT SOUNDS IN THEIR ENVIRONMENT

PRINTED MATERIALS (INCLUDED)

- **Insect Images:** 1 set, printing optional if showing by computer
- **Card Decks:** 1 set of each per pair of learners
 - **Behaviors Deck (What are they doing?)**
 - **Insects Deck (Who are they?)**

OTHER MATERIALS

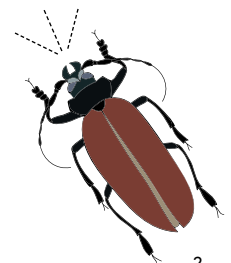
- Computer
- Speakers
- Scissors (1 per instructor)
- Optional: paper clips or resealable plastic bags (2 per pair of learners)
- **Insect Sounds List** PDF (for instructor)

SETUP

1. Review the **lesson procedure**.
2. Review and consider the optional **pre-** and **post-lesson explorations**.
3. Prepare the **lesson materials**:
 - Print the cards; use color if possible so learners can see the insect images clearly.
 - Cut out the cards, making a separate **Behaviors Deck** and **Insects Deck** for each pair of learners. Optional: Use paper clips or plastic bags to keep each set of cards organized.
 - Print a set of **Insect Images** or pull them up on a computer to project or show on-screen.
 - Download the library of insect sounds from the Agricultural Research Service’s Bug Bytes Sound Library at <https://bit.ly/PH-SoundLibrary>.
 - Preview the sounds using the **Insect Sounds List** and test sounds levels. Make sure they are not too loud.
 - Cue insect sounds to play on the computer.

LESSON PROCEDURE

1. Optional: Complete one or more of the **pre-lesson explorations**.
2. Ask learners “What is an insect?” Have them name a few insects they already know.
3. Share **lesson opener**.
4. Tell learners they will be listening to a few sounds today and they will get a chance to guess what insects are making the sounds and what they are doing.
5. Split the class into pairs. Give each pair a card stack made up of the two separate decks: **Behaviors (What are they doing?)** and **Insects (Who are they?)**.
6. For each pair, ask one learner to take the **Insects Deck** and the other to take the **Behaviors Deck** and to look through their options in the deck.
7. Play an insect sound from the **Insect Sounds List** twice... If they need help guessing, share where the insect is located (example: “This insect is in a tree”). This information is listed on the **Insect Sounds List**.
8. Have learners look through their decks and choose one card that they think fits the sound they heard and place the card down for their partner to see.
9. Give partners 1 minute to discuss and decide whether they agree with each other.
10. Share out with the class. Ask learners with the **Insects** cards to hold up their choice and those with the **Behaviors** cards to hold up theirs.
11. Allow for debate if the cards differ between groups.
12. Show the visual that goes with the sound after debate is concluded.
13. Repeat for the remaining insect sounds.
14. Hold a discussion using the **lesson questions**.
15. Optional: Complete the **post-lesson exploration**.





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LESSON OPENER

Share the following with learners to orient them to the topic:

If you take a minute and listen, you will hear that we are surrounded by sounds. Some sounds are human made, others are made by our environment, and some are made by animals. Animals—and in particular, insects—make a lot of sounds. Insects make up a large portion of animals in the world. If we listen carefully, we may hear a lot about how they live in their environments.

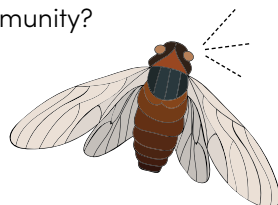
Insects make noises when they are eating, moving around, pollinating, building their homes and nests, mating, and working together. Sometimes they make sounds to communicate with each other directly, such as when they need to send out a warning call. Insect sounds are all around—think of the crunch of a leaf that an ant walks over; or the humming of a chorus of cicadas finding their mates; or the warning hiss of a cockroach; or the buzz of a bee flying around to pollinate flowers.

Today we will investigate several sounds to try to understand what insects are doing in their environments.

Give the class a warning that “We will hear some sounds that you are not used to hearing and that may be loud.” Let learners know they can cover their ears if the sounds are too loud.

LESSON QUESTIONS

- What are the types of places where insects live?
- Do all insects sound the same when they eat? Play? Work?
- Why do insects make sounds?
- What is an insect's place in its ecosystem?
- Who is part of the insect's community?



PRE-LESSON EXPLORATIONS

Help learners complete any of these prompts:

- **Practice listening to sounds in popular music:** Learners listen to a well-known song and talk about the different components that make up a song. Singing can communicate feelings. Drums keep everyone together with a rhythm or can evoke emotion. Harmony can convey emotions and communicate, too.
- **Learn about the different parts of an insect:** Which parts can produce sounds?

POST-LESSON EXPLORATIONS

Have learners complete any of these prompts:

- **Make a field guide:** Create an informational field guide page about one insect you heard. Describe its physical features, sounds it makes, where it lives, and some of its behaviors.
- **Try making an insect sound:** Learn about how the insects make the sounds you heard (which body parts) and use recycled materials to make that sound.
- **Explore your garden:** Look around you to find pollinators in the garden. Listen to the sounds they make, and try to describe their sounds.

ADDITIONAL RESOURCES

- **Macaulay Library media archive.** Search for sound clips of animals: <https://bit.ly/PH-macaulaylib>
- **What Sound Does an Ant Make?** A video on sounds of ants and a beetle that mimics ants: <https://bit.ly/PH-antsound>
- **The Sound of Millions of Monarch Butterflies.** A video of the sound of monarchs gathering together in Mexico: <https://bit.ly/PH-Monarchs>

Insect Sounds List

Instructor Resource

Download the library of insect sounds from the Agricultural Research Service's Bug Bytes sound library at <https://bit.ly/PH-SoundLibrary>. Match the File ID in the table below with the file ID in the downloaded Insect Sounds folder.

SPECIES (WHO ARE THEY?)	FILE ID	LOCATION	WHAT ARE THEY DOING?
mole cricket (<i>Scapteriscus vicinus</i>)	B.8	underground	working (scraping)
citrus root weevil larvae (<i>Diaprepes abbreviatus</i>)	B.1 or B.2	underground beneath a citrus tree	feeding
pine weevil adult (<i>Hylobius abietes</i>)	D.16	on a pine tree	feeding
Asian tiger mosquito (<i>Aedes albopictus</i>)	F.1b or F.1c	in the air	traveling (flying)
ant (<i>Leptogenys kitteli</i>)	G.1c	above ground	traveling (walking)
wasp (<i>Cotesia marginiventris</i>)	F.5	on a plant	communicating (calling)
onion fly (<i>Delia antiqua</i>)	F.9a	in the air	traveling (flying)
brown stink bug (<i>Euschistus servus</i>)	F.12	on a plant	communicating (calling)

Behaviors Deck

**What are
they doing?**

feeding

**What are
they doing?**

traveling
(flying)

**What are
they doing?**

working
(scraping)

**What are
they doing?**

communicating
(calling)

**What are
they doing?**

traveling
(walking)

**What are
they doing?**

feeding

**What are
they doing?**

communicating
(calling)

**What are
they doing?**

traveling
(flying)

Insects Deck

Who are they?

mole cricket



Who are they?

citrus root weevil
larvae



Who are they?

pine weevil
adult



Who are they?

Asian tiger mosquito



Who are they?

ant



Who are they?

wasp



Who are they?

onion fly



Who are they?

brown stink bug



mole cricket (*Scapteriscus vicinus*)



citrus root weevil larvae
(*Diaprepes abbreviatus*)



pine weevil adult (*Hylobius abietes*)



Asian tiger mosquito (*Aedes albopictus*)



Photo: Susan Ellis, Bugwood.org

ant (*Leptogenys kitteli*)



wasp (*Cotesia marginiventris*)



onion fly (*Delia antiqua*)



brown stink bug (*Euschistus servus*)

