Lesson Plan Library

The Insect World

Subject: | **Grade(s):** 6-8 | **Duration:** One class period

Lesson Plan Sections

Objectives

Students will understand the following:

1. Insects are unable to make sounds with their mouths.
2. Insects make sounds with parts of their bodies other than their mouths, such as legs and wings.
3. The sounds they make allow them to communicate with one another.

Materials

For this lesson, you will need:

- Research materials about insects
- A computer with Internet access

Procedures

1. Ask students to describe the kinds of sounds they have heard insects making. You might have them imitate a bee and a cricket.
2. Ask students how they made their "insect sounds." Bring out, in discussion, that although students were able to imitate insect sounds by using their mouths or throats, insects do not make sounds with either of those body parts.
3. Review with students what they know about insects. How do they make sounds? Make sure your students understand that insects make sounds in two ways—by moving their wings very quickly, as a bee or housefly does, or by rubbing their legs together, as a cricket or cicada does. (The term for an insect's rubbing its legs together to make a buzzing or chirping sound is *stridulation* .)
4. Ask students if they can think of any examples of insects using sound for communication. One important example is bees guiding other bees to the hive, or nest.
5. Divide your class into small groups, asking each group to devise a method of communication using only sounds produced by using parts of their bodies other than their mouths.
6. When each group has devised its method, members should demonstrate what they have developed for the class.
7. While one member of each group is blindfolded, select a "hive" somewhere in the classroom. Then time how long it takes for the other members of each group to guide their blindfolded partner to the hive by using only their new method of mouthless communication.
8. When each group has made its attempt, discuss the advantages and disadvantages of this form of communication. Why is it better suited for insects than for humans?

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Adaptations

Have students choose either bees or ants and write reports on how the chosen insect communicates with others of its kind.

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Discussion Questions

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Evaluation

You can evaluate groups on this activity using the following three-point rubric:

- **Three points:** group worked cooperatively; groups interacted constructively with the class as a whole; group members participated actively in postactivity discussion
- **Two points:** group members worked satisfactorily together; group's interaction with the class as a whole was unsatisfactory; group members participated to some extent in postactivity discussion
- **One point:** group members were able to work together to some extent; group's interaction with the class as a whole was unsatisfactory; group members failed to participate in postactivity discussion

You can ask your students to contribute to the assessment rubric by determining guidelines for successful cooperation among group members and interaction of a group with the class as a whole.

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Extensions

Drawing Insect Adaptation
Insects are well designed for the habitats in which they live. Divide the class into small groups, and assign a specific habitat type to each group (e.g., salt marsh, lake, desert, field, arctic tundra, deciduous forest, alpine meadow, or human residence). Have each group create a designer insect, stressing creativity and evolution at its best. Have each group list on paper a detailed description of its designer insect, explaining all the adaptive features that help it to adapt well to its environment. Make sure the students provide a scientific name (genus and species) for their insect that reflects some unique or identifying quality of the organism. Ask students to draw their insect and present it to the class.

Insect Collection
This classroom activity is to be preceded by a homework assignment in which students must walk around their neighborhood for 15 minutes and record on a tally sheet the total number of insects that they can find. The goal is to locate as many insects as possible in the time allotted, so it is up to the students when they will do the searching and whether they will roll logs and turn over stones. (It is preferable, of course, to do this activity when the temperature is above 60 degrees Fahrenheit.) Back in the classroom, the raw data from each student should be listed on the board. Have each student write his or her name, time and place of observation, and total count. Students should then construct graphs of the data to reflect such relationships as total counts for flying compared to walking insects, observations in the morning compared to the afternoon, counts for each hour of the day, counts for different locations, and so forth. Have students discuss the types of graphs that might be useful and why. In small groups, have students create graphs displaying the class findings. After they've completed several graphs, have them discuss what these data might mean about the abundance of insects and their sampling techniques.

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Suggested Readings

The Science Times Book of Insects
Nicholas Wade. Lyons Press, 1998.
Could you like a roach? Surprisingly, the answer will probably be yes after you explore this highly readable collection of articles from the *New York Times* . Find out why the scarab beetle is the recycling king; how nature makes a butterfly's wing; why it is the unlucky male spider that does not die for love. Are you hungry for a snack? Try the tasty 17-year cicada recipe!

Microcosmos: The Invisible World of Insects
Claude Nuridsany and Marie Perennou. Stewart, Tabori, and Chang, 1996.
Future cinematographers pay attention! A companion book to the award-wining movie of the same name, this is an outstanding collection of superb color photographs noteworthy for their unprecedented close-ups and extraordinary detail.

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Links

Iowa State University Entomology Gallery
Great photographs of insects.

Africanized Honey Bees

Lesson plans, grades K-12. Information and activity pages. Website maintained by University of Arizona.

The Butterfly Zone
Offers a "Butterfly Guide," information about a variety of butterflies, and how to attract butterflies to your garden.

The Wonderful World of Insects
Access to a broad range of information about insects and web links.

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Vocabulary

Click on any of the vocabulary words below to hear them pronounced and used in a sentence.

angiosperm

Definition: A flowering plant.
Context: Angiosperms became very abundant at the end of the Jurassic period.

compound eye

Definition: An eye made up of many small separate visual units.
Context: Dragonflies have large compound eyes.

exoskeleton

Definition: An external, supportive, armorlike covering on an insect.
Context: Insects must shed their exoskeletons to grow.

insect

Definition: A member of a class of arthropods with a well-defined head, thorax, and abdomen, and only three pairs of legs.
Context: An adult insect usually has three body segments referred to as the head, thorax, and abdomen.

nectar

Definition: A sweet liquid that is secreted by flowering plants; the chief raw material of honey.
Context: The sugar content of nectar can vary from flower to flower.

pollen

Definition: A mass of microspores in a seed plant appearing usually as a fine dust.
Context: Pollen is produced in the male part of a flower.

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Standards

This lesson plan may be used to address the academic standards listed below. These standards are drawn from Content Knowledge: A Compendium of Standards and Benchmarks for K-12 Education: 2nd Edition and have been provided courtesy of theMid-continent Research for Education and Learningin Aurora, Colorado.

Grade level: 6-8, 9-12
Subject area: life science
Standard:
Knows about the diversity and unity that characterize life.
Benchmarks:
Benchmark 6-8:
Knows that animals and plants have a great variety of body plans and internal structures that serve specific functions for survival (e.g., digestive structures in vertebrates, invertebrates, unicellular organisms, and plants).
Benchmark 9-12:
Knows how variation of organisms within a species increases the chance of survival of the species, and how the great diversity of species on Earth increases the chance of survival of life in the event of major global changes.

Grade level: 6-8, 9-12
Subject area: life science
Standard:
Understands how species depend on one another and on the environment for survival.
Benchmarks:
Benchmark 6-8:

Knows ways in which species interact and depend on one another in an ecosystem (e.g., producer/consumer, predator/prey, parasite/host, relationships that are mutually beneficial or competitive).
Benchmark 9-12:
Knows how the interrelationships and interdependencies among organisms generate stable ecosystems that fluctuate around a state of rough equilibrium for hundreds or thousands of years (e.g., growth of a population is held in check by environmental factors such as depletion of food or nesting sites, increased loss due to larger numbers of predators or parasites).

Grade level: 6-8, 9-12
Subject area: life science
Standard:
Understands the basic concepts of the evolution of species.
Benchmarks:
Benchmark 6-8:
Knows that the fossil record, through geologic evidence, documents the appearance, diversification, and extinction of many life forms.
Benchmark 9-12:
Knows that natural selection leads to organisms that are well suited for survival in particular environments, so that when an environment changes, some inherited characteristics become more or less advantageous or neutral, and chance alone can result in characteristics having no survival or reproductive value.

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Credit

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