

Follow-up Activities

- Have students choose a bug that they are interested in and report on it to the class using visual aids (diorama, poster, model) to explain where it lives, what it does and what it looks like.
- Set up an ant farm in the classroom, and have students create a log of daily observations and drawings that illustrate what the ants are doing.
- Have students design and create a bulletin board display that illustrates the differences between insects and arachnids.
- Brainstorm with the class on a list of stories, songs and books about bugs (i.e. *Anansi the Spider*, *Charlotte's Web*). Divide the class into small groups and have them compare the presentation of the bug in the story with what they have learned about bugs.

Internet Resources

• insected.arizona.edu/lessons.htm

"Using Live Insects in Elementary Classrooms for Early Lessons in Life" is a site designed for kindergarten through 3rd grade teachers. It lists numerous lessons, including activities and information sheets. Excellent for those interested in enhancing any curriculum with a more integrated, hands-on inquiry-based approach.

• www.uky.edu/Ag/Entomology/ythfacts/entyouth.htm

This site is designed for teachers, students and anyone else who is interested in learning about bugs. Several articles give resources and basic information about insects and their relatives, while others outline activities with different insect themes.

• www.slsoc.org/docs/online/spiders/index.shtml

This site contains stories about spiders, as well as lessons, pictures and activities with a spider theme. Spider games and crafts are highlighted, as well as a list of books about spiders and their relatives.

Suggested Print Resources

- Burnie, David. *Insects and Spiders*. Time-Life, Inc., Alexandria, VA; 1997.
- Llewellyn, Claire. *The Best Book of Bugs*. Larousse Kingfisher Chambers, New York, NY; 1998.
- Scarborough, Sheryl. *About Bugs*. Treasure Bay Inc., Redwood City, CA; 1999.

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- Sonenklar, Carol. *Bug Boy*. Henry Holt & Co., New York, NY; 1998.
- Sonenklar, Carol. *Bug Girl*. Henry Holt & Co., New York, NY; 1998. The author blends science fact and humorous fiction in these fantasy books for young readers about children who transform into bugs and go on adventures.

TEACHER'S GUIDE CONSULTANT

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All About Bugs

Grades K-4

This guide is a supplement, designed for teachers to use when presenting the program *Animal Life For Children: All About Bugs*.

Before Viewing: Research in learning suggests that it is important for the teacher to discover what the students know — or think they know — about a topic, at the start of a new unit, so that their accurate conceptions can be validated and reinforced, and their misconceptions identified and corrected. Therefore, after reviewing the pre-viewing discussion questions provided for your class, create a "Everything We Know About..." list. Preview key vocabulary words and have students raise additional questions they hope will be answered by this program. Most importantly, students should be told that as "science detectives" they must listen closely, so that after viewing the program, they will be able to tell whether or not the facts/beliefs they put on their list were scientifically accurate.

After Viewing: After a brief discussion about the program, challenge your "science detectives" to prove or disprove the accuracy of the facts they put on their "Everything We Know About..." list. Discuss what else they learned and use the follow-up questions and activities to inspire further discussion. Encourage students to research the topic further with the Internet and reading resources provided.



Program Summary

Bugs are some of the world's most misunderstood creatures, even though they outnumber all other varieties of animal and plant life combined. There are over one million species of bugs throughout the world, some of which — like the cockroach — look the same today as they did millions of years ago.

Many bugs have segmented bodies, hard outer shells and limbs such as legs and antennae that always come in pairs. The majority of bugs are also known as insects, which are classified by a body segmented into three parts (a head, thorax and abdomen), three pairs of legs, a hard outer shell and a pair of antennae. Another large group is the arachnids, bugs like spiders and scorpions who have eight legs and a body segmented into just two parts.

Like all other animals, bugs must eat to survive, although the methods by which they do so are as varied as their appearances. Some insects bite and chew their food, while others — like the housefly — sponge up whatever pleases their palette. The spider kingdom is divided into two groups based on how the creepy crawlers capture their food — hunting spiders or web-weaving spiders.

Despite our opinion of them, bugs affect us and change our environment in many different ways. While some bugs can destroy food crops, others spread the pollen needed to generate seeds and fruit. A visit with Dr. Carl Olson, an entomologist at the University of Arizona, helps shed more light on these amazing animals, while an experiment illustrates how students can create their own vacuum traps to collect bugs for further study.

Vocabulary

The following words are included for teacher reference or for use with students. They are listed in the order in which they appear in the video.

bug — General term for several groups of invertebrate animals, including insects, arachnids, crustaceans, centipedes and millipedes.

insects — The largest group of creatures in the collection of animals we call bugs; adult insects have three body segments, three pairs of legs, a hard outer shell and two antennae.

segmented — Divided into smaller parts or sections; the body of an insect is segmented into three sections.

skeleton — The supportive structure or framework of an organism that protects its internal organs (see exoskeleton).

limbs — The arms, legs or antennae of an animal's body, used for movement and grasping, but sometimes modified into a sensory organ, as with the antennae.

antennae — The sensory devices on the head of a bug, which help the creature to smell, touch, taste and hear.

abdomen — The segment of a bug's body that houses its digestive and reproductive organs, as well as other specialized functions (i.e. stingers on bees).

thorax — The middle segment of an insect's body, which supports the legs and wings.

arachnids — The group of bugs that include spiders and scorpions, distinguished by eight legs and only two body parts; arachnids are not insects.

hunting spiders — Arachnids such as the tarantula that hunt and chase their prey.

web-weaving spiders — Arachnids that spin webs in order to capture their prey.

fungus — Simple organisms such as molds, mildews and mushrooms.

entomologist — A scientist who studies bugs.

evolution — The natural process by which a species changes over time.

exoskeleton — The hard, outer shell covering an organism; a skeleton on the outside of a body that serves to protect the organism from damage and dehydration.

camouflage — The ability of some animals to blend in with their surroundings.

mandibles — A bug's mouth parts.

Pre-viewing Discussion

Before students generate their list of "Everything We Know About..." this topic, stimulate and focus their thinking by raising these questions so that their list will better reflect the key ideas in this show:

1. What is a bug? How many kinds of bugs are there?
2. What are some bugs you know?
3. What are the different parts of a bug's body?
4. What is the difference between a bug and an insect?
5. Is a spider a bug or an insect?
6. Are bugs animals?

After the class has completed their "Everything We Know About..." list, and before watching the show, ask them what other questions they have that they hope will be answered during this program. Have students listen closely to learn if everything on their class list is accurate and to hear if any of their own questions are answered.

Focus Questions

You may wish to ask your class the following questions to assess their comprehension of key points presented in the program:

1. About how many different types of bugs are there?
2. What is the importance of a bug's outer shell?
3. What is the difference between a bug and an insect? How are they alike?
4. What are the three segments of an insect's body?
5. What is the importance of an insect's antennae?
6. What is the thorax?
7. What is the purpose of an insect's abdomen?
8. How many legs does an insect have?
9. What kinds of bugs make up the arachnid group? What are some of their characteristics?
10. What two ways do spiders capture their food?
11. What is an entomologist?
12. How do some bugs hide or protect themselves from being seen or eaten by predators?

Follow-up Discussion

The most important part of this segment is to examine both the facts and beliefs generated by the class in their "Everything We Know About..." list. Research indicates that students will retain their previous misconceptions — in preference to the new information — until they actively recognize and correct their own errors. Because of this, it is important to lead students to the correct ideas while identifying and correcting any misconceptions from the class list. After reviewing the list, encourage students to share the answers they got to the questions raised before viewing the program.

Raising a thought-provoking question is a good way to assess the overall depth of understanding. A couple of suggestions are listed below:

1. Explain the following statement: "All insects are bugs, but not all bugs are insects."
2. Have students discuss the bugs they encounter in their everyday lives — which ones do they like and which ones do they run from? Why?
3. While there are lots of ways we deal with pesky bugs, they are also important to us in many ways. Discuss with students the ways in which their lives would be different if there were no bugs on the Earth.