

**URBANA PARK DISTRICT
Anita Purves Nature Center**

SCHOOL TOUR: **BILLIONS OF BUGS**

TEACHER'S GUIDE

Grades: **1st & 2nd**

Program Length: **1.5 Hours**

Focus Concept: *Insects and their relatives live almost everywhere on Earth, are vital to the ecosystem, and have many interesting adaptations.*

OBJECTIVES: Students will

1. Develop awareness of insects
2. List at least three characteristics of insects
3. Be aware of where insects live and what they eat
4. State why insects are important to the ecosystem

INTRODUCTION

There are more species of insects than all other animals together (over 300,000 species of beetles alone!). Insects have exploited every environment except salt water. Some insects we consider pests, while others are extremely helpful. Insects have very interesting life cycles, body forms, and ways of moving. However, when asked to name an animal, most children will name a mammal. Seldom do children consider an insect an animal.

In this program, students will be introduced to the diversity and adaptability of insects. They will review the structure of an insect by "Building a Bug" out of their classmates. They will then search for and catch insects in two habitats, a prairie garden and a forested area. They will see unusual insect homes (such as galls), learn some of the things insects like to eat, and be introduced to the concept of metamorphosis.

Common Core Standards Correlated

Area	Strand	Standard	Standard Numbers
English Language Arts	Speaking/Listening	Comprehension & Collaboration	1.SL.1,2,3 2.SL.1,2,3
English Language Arts	Language	Conventions of Standard English	1.L.1 2.L.2

Next Generation Science Standards Correlated

Physical Science	Life Science	Earth & Space Science
	1-LS1-1, 2-LS4-1	

Illinois Learning Standards Correlated

Learning Area	Goal	Standard	Benchmark
Mathematics	6	D	1
Science	11	A	1a,1b, 1f
	12	A	1a, 1b

		B	1a, 1b
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The activities listed below are intended to provide ideas for before or after the field trip. Feel free to adapt activities to match your students' ability level.

SUPPLEMENTAL ACTIVITIES

Insect Characteristics: Introduce the students to the characteristics that make an insect an insect:

- Three body parts – the head with compound eyes, antennae, and mouth parts; the thorax with wings and legs; and the abdomen.
- Six legs
- An exoskeleton

Insect Homes: Take the students on a walk through the schoolyard or a nearby field or park. Have them look for a wide variety of possible insect homes. Examples could include:

- On plants or in stems of plants; in fruits or vegetables; galls
- Under logs or under ground
- Under the bark of trees or in acorns or walnuts
- In water
- On animals
- In homes the insects made themselves (such as bee hives)

While looking for animal homes, also encourage your students to think about the wide variety of things insects eat.

Build a Grasshopper: Using the enclosed Copycat Page from *Ranger Rick*, have the children "Build a Grasshopper" by cutting out the squares, then pasting them on another sheet of paper and labeling them.

Metamorphosis Stories: Read *The Caterpillar's Story* or *The Very Hungry Caterpillar* and have the children act it out as a play.

Surprise Terrarium: To help the students learn how insects use camouflage, make a "surprise terrarium". Make a terrarium with vegetation suitable for an insect that uses camouflage, such as a leaf hopper, walking stick, or grasshopper. The insect should be hard to see. Have the students observe the terrarium and describe what they see. Is there an animal living in there? Show the students pictures of insects (or other animals) that blend with their environment, and discuss camouflage. How does it help the animals? If they still haven't seen the insect in the terrarium, have them look very closely until they do. Have them tell you some of the things they have learned about the importance of camouflage to the animal. If the insect was brought in from the wild, return it to its natural home.

"Invent an Insect" (The students may have done this at the Nature Center if they had a rainy day program.) Now that the students have learned about insects, have them invent their own. Make "invention cards" (or write a list on the chalkboard) of possible insect habitats, or of possible insect characteristics such as:

- Invent an insect that lives in water.
- Invent an insect that lives in a cave.
- Invent an insect that lives in a tree.
- An insect that can run faster than you.

- An insect you wouldn't want to touch.
- An insect you can see through.
- Or create your own possibilities.

Have them draw a picture of their insect and describe what it eats, what might eat it, how it moves, how it survives in its home, etc.

Imaginary Insects: Have the students create their own imaginary insects through drawings, modeling clay, pipe cleaners, or paints. Or have them create insects using 3 connected egg sections of an egg carton for the 3 body parts. Have them attach pipe cleaners for antennae or legs, and paint on compound eyes and mouth parts. Let them be creative.

Bee Observation: Place a dish of honey outdoors near the window. How long before a bee finds it? How long before more come? What happens if you place it outside at the same time every day and then skip a day? Research the behavior of bees and how they communicate.

Metamorphosis – Observe the life cycle of mealworms: The mealworm is the larva of the darkling beetle. Mealworms are often used to feed lizards and may be purchased from pet stores. Fill a clear plastic shoebox with oatmeal or bran cereal, add a slice of apple or carrot for moisture, and place the mealworms in the box. Check the box every few days to be sure it is moist but not too wet. You probably won't know how old the mealworms were when purchased, so watch them daily.

- Have the children observe the mealworms in the container, or give them a mealworm to observe in a petri dish with a hand lens.
- The mealworm larvae will change into stiff white pupae, which will then change into beetles. (Feed them small bits of raw vegetables.)
- The children can draw pictures of the beetles at different life stages.
- When the adult beetles emerge, have them notice the differences between the larvae and adults. How many body segments so they have now? How many legs?
- With several weeks of observations, all four metamorphic stages can be observed. If the adults are returned to the box, they will mate and the females will lay eggs and die. When the eggs hatch, the life cycle will begin again.

Beneficial Insects: Have the students think about ways that insects are helpful to people. (Plant pollination, control of other pests, provide food for other animals, are good indicators of water pollution, etc.) Have them think about ways that they are harmful to people. (Eat crops, spread disease, bite, sting or stink, ruin stored crops, etc.) Do they like insects now that they know so much about them?

Other Resources: Borrow the Nature Center's Insects Educational Loan Box. This box contains insect specimens, books, tools, and an activity guide to help your class continue their study of insects. Call the Nature Center at 384-4062 for further information.

VOCABULARY These words will be used by the educators during the program.

Abdomen	Compound eyes	Head	Metamorphosis
Adaptation	Diversity	Insect	Mouth parts
Antenna/Antennae	Exoskeleton	Legs	• Chewing
Arthropod	Habitat	Mandible	• Lapping

- Piercing Spider Wings
- Sucking Thorax

References

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Cole, Joanna & Bruce Degen. *The Magic School Bus Inside a Bee Hive*. Scholastic. 1996

DeLuise, Dom. *Charlie the Caterpillar*. Aladdin Paperbacks. 1990

Florian, Douglas. *Insectlopedia*. Harcourt Brace. 1998

Imes, Rick. *The Practical Entomologist*. Simon & Schuster. 1992

Glaser, Linda. *Dazzling Dragonflies; A Life Cycle Story*. Millbrook Press. 2008

Mortensen, Lory. *In the Trees, Honey Bees*. Dawn Publications. 2009

Project Wild. Council for environmental Education. 2001

Ranger Rick's Naturescope: Incredible Insects. National Wildlife Federation, 1989

Ryder, Joanne. *Where Butterflies Grow*. Lodestar Books. 1989

Shields, Carol diggory. *The Bugliest Bug*. Candlewick Press. 2002

Winner, Cherie. *Everything Bug*. NorthWord Press. 2004

The Anita Purves Nature Center also has an Insects Loan Kit and is a host site for the IDNR Insects and Spiders Loan Trunk. Call 384-4062 for information on borrowing these resources.

Websites

<http://www.uky.edu/Ag/CritterFiles/casefile/casefile.htm>

<http://animals.nationalgeographic.com/animals/bugs/>

<http://urbanext.illinois.edu/insects/09.html>

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