



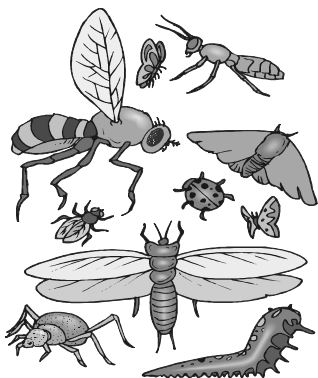
# Bugging Out

## Materials:

- ☆ research materials for insects such as field guides (Peterson, Audubon, Golden Guides).  
A good book for lower grades is *Creepy Crawlies* by Cathy Kilpatrick, EDC Publishing, 10302 E 55th place, Tulsa OK 74146. Another good resource is the National Science Teachers Association Insect Poster from the 1978 *Science and Children*, produced by Carolina Biological Supply, 2700 York Road, Burlington, NC 27215. Insect guides and pictures are also available at many sites on the Internet.
- ☆ Assorted art supplies such as tissue paper, fabric, buttons, beads, sequins, glue, pipe cleaners, and tape.

## Rationale

Studying insects, one of the most diverse group of existing animals, serves as example of natural diversity that most students will have encountered.



## Objectives

1. Students will research general and specific insect traits and relate them to necessary food and habitat.
2. Students will become aware of the huge diversity found in the insect class.
3. Students will explore insect adaptations and relate those adaptations to specific habitats.

## Background Information

Insects far outnumber all the other species of animals in the world combined. It is speculated that there may be over 200 million insects for every living person. To date, approximately 900,000 species have been discovered but experts estimate that number may represent only 10% of the insects in the world. Insects have adapted to all terrestrial and freshwater habitats and to most climates. Only in the oceans are insect numbers fairly limited.

## Activity One: So Many Kinds!

### PROCEDURE:

1. Brainstorm as many different kinds of insects students can name. Types of insects that live here in Arkansas and which students may recognize include grasshoppers, dragonflies, moths, butterflies, beetles, bees, ants, katydids, praying mantis, walking stick, termites, and (of course!) mosquitoes.
2. Have students research insects in general to answer some of the following questions. This may be done in class or as a homework assignment (younger children can do this at home as a parent-child project). Conduct an information sharing session after the research is completed.
  - What traits are the same for all insects? (6 legs, usually 2 pair of wings, exoskeleton, compound eyes).
  - How do male and female insects differ? (ovipositor, maybe size and/or color).
  - What are some insects who are named for their characteristics? (pine borer, walking stick, praying mantis).
  - What special traits do some insects have that fit them for certain habitats? (color, leg and/or wing types, shape, size, mouth parts).
  - What are some ways that insects help man? Harm man?
  - What was the largest insect you read about? The smallest?
3. Have students design and construct their own insect using various materials. You might require that they include the general body parts of an insect: a head, thorax, abdomen, legs, or antenna; or you might let them design their own requirements.

## Activity Two: Whose Home?

### PROCEDURE

1. Brainstorm as many different types of homes for insects as possible (termite and ant mounds, paper wasp nests, dirt dauber nests, bark beetle trails in wood, fleas and lice in hair). If possible, try to have classroom examples and ask students to bring in others (be careful the insect isn't still in the structure).
2. What traits do the insects have that enable them to construct their homes? (jaws to chew wood for paper or tunnels and to tunnel through or move dirt, etc.)

## Activity Two—Continued - Indoors

3. Construct your own insect homes based on the insects designed in Activity One. Let other students guess what type of insect could live there or try matching insects to homes.

## Activity Two—Continued - Outdoors

4. Divide the class into three groups (more if your school grounds have enough variety to provide different habitats). Assign each group a particular part of the school ground that represents a particular habitat. For instance select grassy areas for the grasslands or prairie; flowerbeds or around trees for the forest; and a paved or gravel parking lot for a de-

sert. Have each group hide their insects in their assigned habitat. Have students count how many they hide in each area.

5. Have each group in turn lead the others to their habitat. Tell the other students they are hungry predators (birds, shrews, frogs, snakes, etc) searching this habitat for insects to eat. Give them ten minutes to find as many insects as they can (you might provide paper/plastic bags for them to carry their prey in). Have each habitat group count the number of insects found; then collect and count those insects that escaped predation. Move on to the next habitat until all have been searched.
6. Place the insects on a large piece of paper under the correct habitat, separating the eaten and uneaten ones. Have students think about the habitats one at a time and give reasons why some insects were captured and some escaped.
7. Discuss the following questions:
  - Could any of the insects have remained hidden in more than one habitat?
  - What if everyone had known from the activity's start where their insect would live?
  - What would have happened if all the insects looked just alike?
  - How do different habitats encourage variety in animals?
  - What would the predators have done if a flood or a fire had destroyed their habitat?

- Explain how different predators search for prey in different places and in different ways.

## Activity Three: Locomotion Adaptations

### PROCEDURE

1. Insects move by flying and gliding, walking, jumping, crawling and swimming. Brainstorm with students to name insects that utilize each of these methods, and what adaptations enable them to do this.
  - **Flying**-bee, wasp, dragonfly-wings, usually two pair.
  - **Walking**-ant-six legs, some with suction cups.
  - **Jumping**-grasshopper, cricket-large hind legs, wings to glide further.
  - **Crawling**-caterpillars-legs on front and/or back or on all body segments.
  - **Swimming**-whirligig beetle, predacious diving beetle-six legs, ability to tuck an air bubble under wings.
2. Describe habitats in which the above insects could succeed.
  - **Fly**-open areas such as prairies, from tree to tree in woods.
  - **Jump**-grassy and shrubby areas.
  - **Crawl**-litter to hide under in forest or through rotten logs.
  - **Swim**-quiet pools and streams.



3. Capture some common insects such as ants, beetles or termites to test their locomotion. Use more than one type for comparison.
  - How fast can the insect run from the center of a circle 60-cm (or other) in diameter?
  - In what order do the 6 legs of an insect move when it walks? Is this order the same for all kinds of insects?
  - How does the leg movement of insects compare with leg movement in 2-legged creatures such as humans, dogs and other 4-legged animals, and 8-legged spiders?

### Extensions

1. Purchase a variety of plastic insects. These may be found in many local area stores and in school supply catalogues, etc. Have students group the insect models according to their traits (wing type, leg adaptations, etc.), then use field guides or keys to identify each type or group.
2. Raise some classroom insects such as mealworms (darkling beetles), butterflies, ants or ant lions. Research the type of habitat and food they need. Observe their eating patterns. What foods do they prefer? How much food do they eat in a week? How do their mouthparts work while eating?
3. Make class costumes for students to wear and act out insect examples. Wings

could be made from wire and paper or cloth, coffee can stilts could be suction cup feet.

4. Compare your jumping ability to those of a cricket. Measure how far the cricket jumps, then how far you jump flat footed. Measure the cricket's length and divide it into his jump length, then do the same for yourself. The answer you get is an estimate of how many times its own body length an organism can jump.
5. Have students choose one of the insects they made and write a story about how it felt to be the object of a search. You may wish to start the story for them by saying "Henry Q. Bug was eating a leaf when suddenly he felt the ground vibrate" .....What happened next? How did Henry feel? What did he do? What happened to him? You may make this a class story, taking ideas from all the students.
6. Create bulletin boards with habitats for the insects you constructed. Place them where they seem to belong. Or do bulletin boards for the habitats you did not use in the activity and construct new insects that fit them.
7. Graph the eaten-uneaten insects for each habitat. Which habitat seemed to offer the most protection and why?
8. Have the class construct one giant insect. Divide the class into groups of 2-3 students, and give each group a large sheet of drawing paper. Have group one design the head, group two the tho-

rax, group three the abdomen, group four the wings, group five the legs. Bring all the pieces together to make one insect, and have the class name it. Try to hide it on the playground to test its camouflage abilities.

9. Have students gather incredible insect facts. Post the facts around the room and have students develop categories for them, such as facts for Arkansas insects, and insects from other parts of the world. The students could also vote on the fact they find to be most surprising,



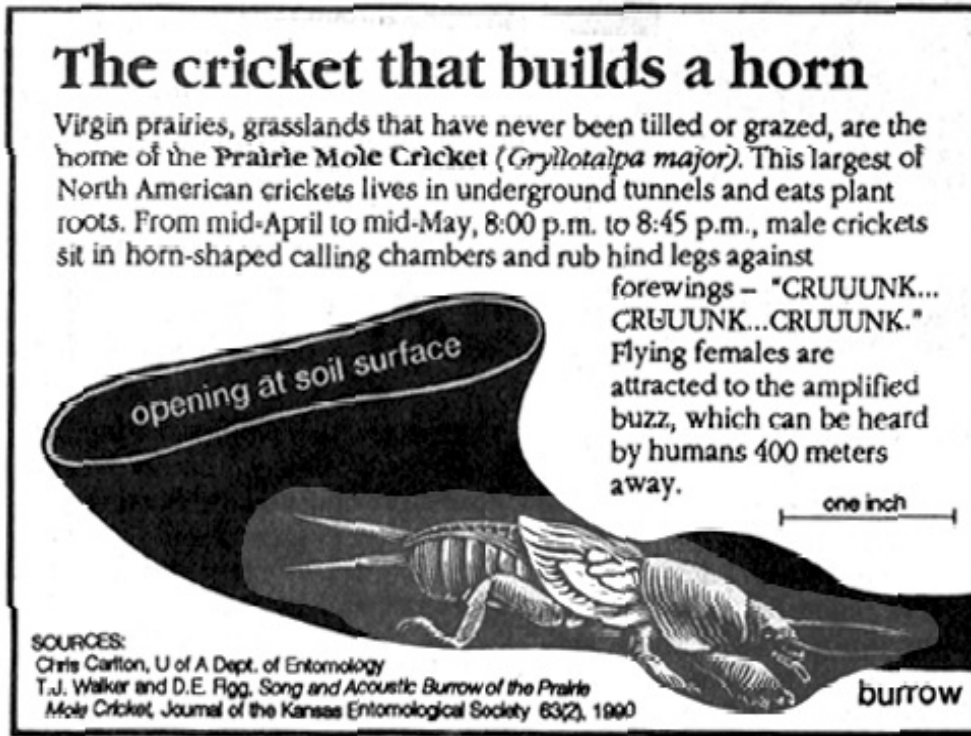
### Insect Fact Examples

- Crickets hear with their "knees", where they have special openings.
- Moths can smell with their antennae.
- Flies taste with their feet. They like sweets such as sugar.
- The world's longest insect is the Giant Stick Insect from Asia.
- Some insects, such as aphids, give birth to live young.
- Potter Wasps sting and paralyze caterpillars to place inside their nests for their young to feed on.
- The male cicada is the loudest insect in the world. It can be heard from 400 meters.
- A flea can jump 200 times the length of its body.

### An Arkansas Example

The Prairie Mole Cricket is one of the insect species the Arkansas Natural Heritage Commission continue to research and inventory. This cricket is only found in seven counties of northwest Arkansas.

The following graphic is from the *Arkansas Gazette*, June 19, 1990.



**Correlation to  
National Science Standards**  
Life Science

**Correlation to  
Arkansas Frameworks**  
Science: K-4: LS2.4, LS2.8, LS2.10  
5-8: LS2.7, LS2.9  
9-12: LS2.4, LS2.10, LS2.18  
Language Arts: W1.4,W2.3,W2.5,  
R2.1, LSSV1.6  
Social Studies: 1.1.3  
Math: M1.1,D.S.P.1.1.C