MINIBEAST POSTVISIT MATERIAL

The naturalist staff suggests the following activities to reinforce and further the study of minibeasts with your students:

Insect, Crustacean, or Arachnid?

Make a copy for each student. Follow the instructions on the page. Answers: 1. Centipede, 2.grasshopper-insect; 3. Butterfly-insect; 4.tick-arachnid; 6.crab-crustacean; 7. Spider-arachnid; 8. Crayfish-crustacean; 9. Millipede; 10. Caterpillar-insect larva.

Disguised as Royalty

Make copies of the illustration and background information for each student. Viceroy and monarch butterflies are found in our area. Using a color field guide for accurate coloration, have each student color the page. Use this activity as a springboard for each student to research their own different minibeast. Creatures should include insects, arachnids, crustaceans, and others we discussed. They may want to study creatures not found in our area, such as the morpho butterfly, leaf cutter ant, or tarantula from the tropical rain forest. The coloring book, *Stat Exploring Insects,* by George S. Glenn, Jr. is an excellent resource book, and provides illustrations for many interesting insects, including the enclosed activity sheet.

Minibeast Gallery Walk

Preparations: Make copies of the poster parameters and Minibeast list for each student. Have poster board available for each student. Gather magazines that students can use to cut out pictures of their species. Past issues of *National Wildlife*, *International Wildlife, Natural History, Audubon, Ranger Rick,* and *National Geographic* are all good sources. CD-ROMS and the internet may also have information and pictures students can download. If your school has a computer lab with these resources, you may want to set up a time for your group to use the lab for their research.
Allow students to choose an animal from the list that they would like to research. Each student will need to research his or her animal and then create a poster designed to teach others about it. Review the poster parameters and emphasize what the students should be trying to find out about their species-this is the kind of information they should include on their poster. Hand out poster board and give students time to conduct research.

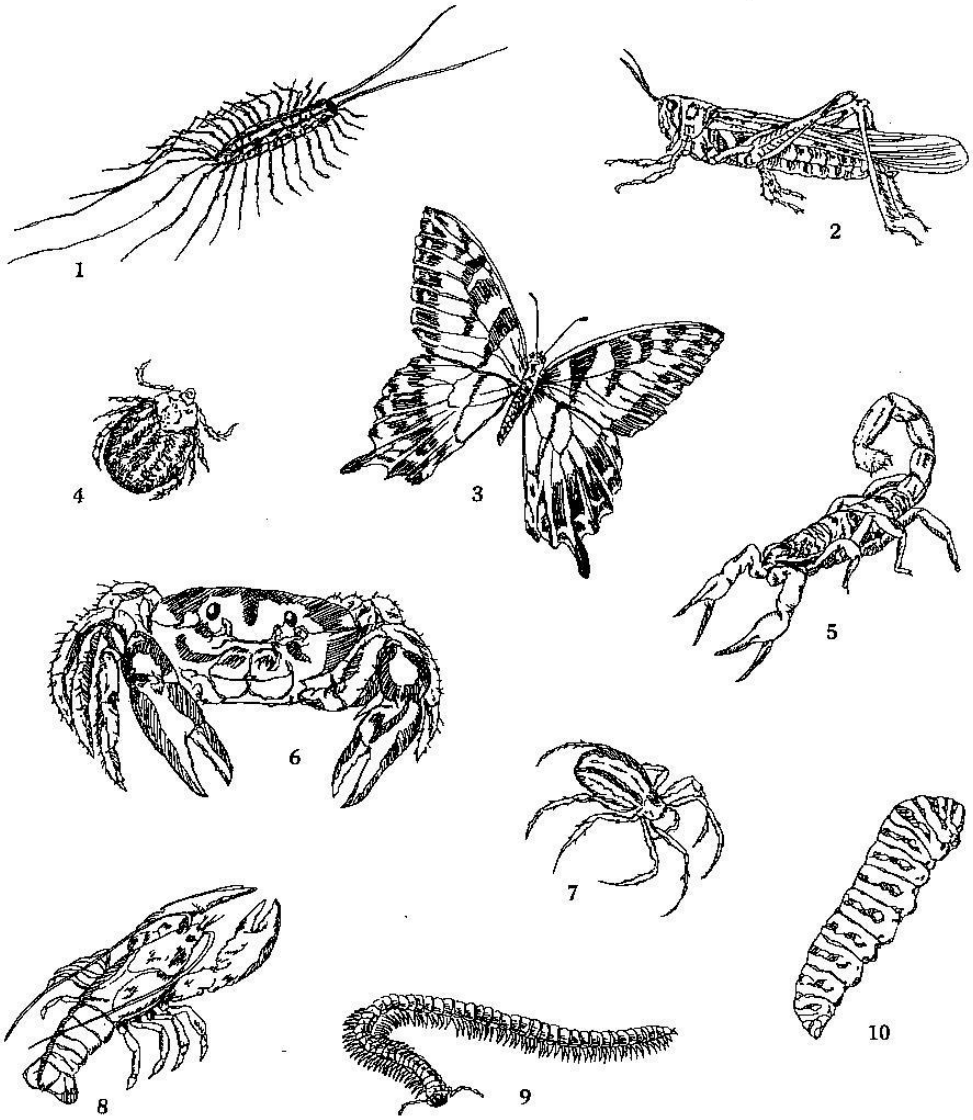
When the students have finished their posters, use them to create a scavenger hunt. Your hunt might include statements like the following:

Find one crustacean and name it.
Name two minibeasts that are active at night.
List two minibeasts that live in the forest.

The statements will need to come from the students' posters and should be designed to get students to read each other's posters. You should also be sure to include statements that cover the full range of animals your students researched. Next hang the posters where everyone can see them and hand out copies of your scavenger hunt clues to the group. Explain that the students should "tour the gallery" reading each other's posters to find the answers to the scavenger hunt sheets. After the students have finished their scavenger hunt, review their answers as a group. Adapted from Windows on the Wild: Biodiversity Basics, World Wildlife Fund 1999

INSECT, CRUSTACEAN, OR ARACHNID?

Which minibeasts are insects? Circle the insects.
Which minibeasts are crustaceans? Put an X on each one.
Which minibeasts are arachnids? Put a line under them.
Which minibeasts do not belong to any of these three families? Name each minibeast.



Adapted from: *Nature Scope Incredible Insects*, National Wildlife Federation, 1988

Poster Parameters

Your poster should include the following natural history information about your minibeast:

What type of habitat does it live in?
What does it eat?
How does it get its food?
How long does it live?
Where does it breed?
What are its adaptations?
When is it active (night? day? year round?)
What kind of life cycle does it have?
What does your species look like? (pictures or drawings)
Where does your species live? (a range map)

The poster should not be a report. It should present the required information in pictures, diagrams and easy-to-read chunks of text arranged in an informative and creative way that will capture people's attention. Pictures and diagrams should have captions that explain what is shown.

Insects
Cecropia Moth
Luna Moth
Monarch
Woolly Bear
Mosquito
Dobsonfly
Meadow Spittlebug
European Earwig
Small Whirligig Beetle
Boll Weevil
Two-spotted Ladybug Beetle
Pyralis Firefly
Two-spotted Stink Bug
Eastern Eyed Click Beetle
Elephant Stag Beetle
Field Cricket
Gladiator Katydid
True Katydid
Periodical Cicada
Common Waterstrider
Northern Walkingstick
Praying Mantis
Leafcutting Ant
Twelve-spot skimmer
Doubleday's Bluet
Robber Fly
Crane Fly
Paper Wasp
Potter Wasp
Honey Bee

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Amphibians
American Toad
Fowler's Toad
Northern Slimy Salamander
Redback Salamander

Spiders
Ant-mimic Spider
Orb Weaver
Nursery-web Spider
Garden Spider
Thin-legged Wolf Spider
Brownish-gray Fishing Spider
Spitting Spider

Mites
Velvet Mite

Scorpions
Centruroides Scorpion

Centipedes
Common Scutigera

Millipedes
Greenhouse Millipede

Crustaceans
Pill Bug

Disguised as Royalty

Poisonous insects often display warning colors and patterns that keep predators away. Insects that are not poisonous have evolved patterns that make them look like their poisonous cousins. This use of disguise to appear like another creature is called *mimicry*. A great number of edible insects find protection by mimicking species that taste terrible.

Famous for their long migrations, monarch butterflies arrive in the northern United States in the spring to lay eggs on milkweed. Monarchs are poisonous. Their caterpillars display distinctive warning stripes of black, yellow, and white, and the adults have orange and black warning patterns.

Monarchs are a highly visible species and fly unmolested under the protection of their warning colors and terrible taste. Their distant relatives, the viceroys, have a similar wing pattern. But viceroys are delicious to predators. When flying, the two species look alike. But close examination reveals that viceroys are smaller, and have a simpler series of dots on their forewings. To birds, these small differences aren't enough to help them tell the two varieties apart. The viceroys are left free to fly.

Proof that the viceroy is edible can be found in its caterpillar. Feeding on willow trees, which contain no poisons, viceroy caterpillars don't display warning colors. Instead, they attempt to look like inedible objects. In the early stages of their development, these caterpillars have contrasting patterns of brown blotches and irregular white patches. This coloration makes them look like bird droppings. Birds ignore them.

Though you may be able to distinguish monarchs from viceroys after careful examination, try to identify them correctly when they are flying. You'll understand why birds avoid both rather than risk eating an unpleasant snack.

Start Exploring Insects by George S. Glenn, Jr., Running Press Book Publishers, 1991.

The smaller, edible viceroy butterfly (top) has the same black veins and orange patches as the monarch (bottom).