

Governor's Conservation Classroom Challenge

Challenge # ES – 1

Title: Investigate A Grasshopper's Life Cycle in Your Schoolyard

Grade Level: K-2

Subjects: Science, Math

Abstract:

The relative abundance and small size of insects make them excellent subjects for young students. Schoolyards provide a readily accessible location for studying life cycles of individual species. By investigating grasshoppers outside the classroom, students will develop observation and collection skills while exploring the habitat of a common insect. Best time of year to conduct this study is in late spring.

Objectives:

Students will be able to: describe differences in grasshoppers at different stages in their life cycle; identify components of a grasshopper's habitat; and generalize adaptations that allow grasshoppers to thrive.

Materials:

Bug boxes, small aquarium nets, sweep nets, plastic sheeting, magnifying glasses, clipboards, tally sheets

Safety:

Provide parents and students with activity description in advance, particularly in regards to suggested footwear. Review student allergy information. Discuss appropriate equipment and insect handling procedures and emphasize the importance of giving each other space to operate. Identify poison ivy, proximity to parking lot or other potential hazards with the group, if applicable.

Background:

Additional teacher background for this challenge can be found in the [Virginia's Natural Resources Education Guide](#) chapter on *Wildlife*.

Procedure:

Grasshoppers have a simple life cycle and go through five nymph stages before becoming an adult. There are several species in Virginia, many of which are commonly found on school grounds. All feed on plants and can become crop pests, although most feed on native plants and grasses exclusively. Within the family are the crickets, katydids and locusts. Grasshoppers lay eggs in late fall that over winter and hatch in the spring when the ground warms. Many species have wings and are capable of flying short distances when disturbed or looking for food. Grasshoppers are also a major prey species providing food for many species of birds, toads, and reptiles.

Before going outside in search of grasshoppers, visit the library for non-fiction and fictional books about grasshoppers, and review their life cycle stages and habitat requirements. An image search on the internet will illustrate the tremendous variety and colors of grasshoppers, from greens and browns to bright reds and blues. Virginia grasshoppers are mostly shades of yellowish green to green and brown. Becoming familiar with grasshoppers will aid the students while they conduct their investigation.

Divide the class into small groups of approximately 5 students. Each group will need a clipboard with a tally sheet to record the number of grasshoppers seen and other information based on learning objective. Assign each group a section of the school yard to explore. The group should walk side by side in a line slowly through their assigned area. To avoid confusion or argument, marking the study sections with different colored flags or other means is advisable. The student with the clipboard should be in the center so he/she can tally the

number of grasshoppers seen. If the school has a fence line with tall weedy plants the groups can visually search different sections. Caution the students not to disturb the grasshoppers while they are observing them. For reflection, ask students what the insects were doing when they observe them and what they noticed about the grasshoppers' physical structures such as legs, antennae, color etc.

Once the students are familiar with where to find the grasshoppers and how to calmly approach them, it is possible to confine a limited number for more detailed observation. There are several methods of capturing grasshoppers and with a little practice students can become quite skilled. Explain to students that the insects will be captured and released and remind them of appropriate handling techniques to prevent injury.

Using sweep nets or small aquarium nets have students collect as many grasshoppers in the schoolyard as they can in a specified time period, such as 15 minutes. Another method is for two students to walk slowly through the grass holding the short sides of an approximate 3' x 5' clear plastic sheet. On cue, they quickly lower it so both sides hit the ground at the same time. Once the sheet is on the ground, other group members can approach from all sides to detain the insects with small nets. Once captured, the students should carefully place the grasshopper into a bug box or clear container. The collected grasshoppers need to be placed in a cool dark place until they are ready to be observed by the entire class.

Back in the classroom or at a picnic table have students sketch the grasshoppers, noting the length of the antennae, legs, and whether or not the grasshopper is an adult. Since grasshoppers go through 5 nymph stages before reaching their final length of up to 2.5 inches (for some species,) graphs can be created showing the different sizes. A grasshopper's length can be measured by placing the clear bug container on a piece of graph paper and counting the squares the grasshopper covers. The ratio of adults to nymphs can be compared on a bar graph. If the exercise is repeated later in the spring ask students if this ratio changed?

Extension:

An expansion of this investigation would be to set up a terrarium to house a few grasshoppers in the classroom for a week, so they can be observed closely when feeding. Place about an inch of soil or sand in a large container with a ventilated lid or mesh on the top. Do not place the container in the window. Each day provide fresh grass or leafy vegetables. Grasshoppers will also eat grass seeds, dry oatmeal or grains. At the end of the week release the grasshopper back in the schoolyard. Compare grasshoppers to other insects studied such as butterflies.

Stewardship:

Grasshoppers inhabit grassland ecosystems which face a variety of pressures. Competition from other types of plants is widespread. A possible stewardship project would be to remove an invasive plant species from a section of school yard or grow a tray warm season grass plugs or native wildflower seedlings which could be used in the schoolyard or for a neighboring restoration project.

Additional Resources:

For additional investigations on grasshoppers see *Project WILD* activity "Grasshopper Gravity" or Growing Up WILD activity "In a Grasshopper's World" www.projectwild.org

Virginia's Animals and Their Habitat cross-curricular unit contains instructions on making a sweep net from a T-shirt as well as additional investigations on insects. To download visit: http://www.doe.virginia.gov/instruction/cross-curricular_instruction/science/animals_habitats/topic2_classification.pdf

Trade books about Grasshoppers:

Are You a Grasshopper? J Allen and T Humphries
The Life Cycle of a Grasshopper L. Trumbauer

