Sheet Shake in the Schoolyard

Goal: Students conduct an investigation examining arthropod diversity as they develop a research plan and discuss scientific investigations skills.

Objectives:

Knowledge- Students will examine shrubs in their schoolyard or nearby areas to compare arthropod diversity.

Skills- Students develop observation and data collections skills while examining and comparing diversity of arthropod in different shrubs.

Values- Students will understand how different organisms are associated with different shrubs and that biodiversity can vary among habitats. Students will appreciate arthropod diversity.

Grade(s): 6-8

Special Safety: Be aware of any insect allergies before beginning this program.

VA Standards addressed: Science 6.1, LS.1, LS.4, LS.6, LS.8. Math 6.2, 6.14, 7.11, 8.14

Materials:

Sheets
Insect jars
Nets
Clipboard, paper and pencil/ per group
Stopwatches
Dry erase boards
Dry erase markers
Insect or arthropod ID guides (see web resources below)

Procedure:

1. Set-up- The day prior, the instructor should test shake a few trees in the schoolyard to prepare and be sure there are adequate organisms for the study. This exercise can be scaffolded based on student levels.
2. Divide students into groups of 4-5. Assign each group to a shrub. Instruct students to shake the shrub and collect the organisms that fall. By design, this is very open ended!
3. After 10 minutes, bring groups together to discuss their results.
4. Inquiry Part 1: What did you find? How did you sort? Did you sort? Did all students shake the tree for the same amount of time? Move the conversation to: How can the collection method be improved? Should the students all use the same sampling methods if they want to compare data?
5. Instruct the class to decide as a group how to sample and collect. If needed, remind students that all groups need to be collecting the same data (for example, note the type of plant, the time they shook the tree, etc.).
6. Conduct the second shake. Instruct students to shake the tree for a given amount of time, collect organisms in jars, then sort them and record their results.

7. Students then sort organisms into groups. They do not need to name them with scientific names! Students can describe them and sort them based on characteristics (size, shape, mouthparts, number of wings, etc.).
8. Inquiry Part 2: How can we compare the diversity of organism collected in the shrubs? How do we want to view this information?
9. One method is to calculate the number of types of organisms and populations. Percent composition- for each organism, divide the total of that type/species by the TOTAL # of organisms found then multiply by 100.
10. Extend: ask students if they know other ways to determine diversity. Generate a list (example Simpson's index, Shannon-Weaver for high school math connections).

Web Resources

http://www.insectidentification.org/
http://www.whatsthatbug.com/
http://bugguide.net/node/view/15740
http://www.amentsoc.org/insects/what-bug-is-this/adult-key.html

blandy.virginia.edu/education/VRUECconservationchallenge
http://www.amnh.org/explore/curriculum-collections/biodiversity-counts/plant-ecology/calculating-a-biodiversity-index