

# Macroinvertebrate Organism Field Station

Virginia Science SOLs 6.1, 6.5, 6.7, LS.1, LS.4, LS.5, LS.7, LS.8, LS.10 and LS.11

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**Key Concepts** life cycles of aquatic organisms, physical adaptations, in-stream food webs, aquatic habitats, environmental influence on organisms and biological water quality monitoring

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**Setting** State Fair of Virginia grounds at “The Meadow” or other suitable outdoor site

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**Summary** Students examine a variety of benthic macroinvertebrates and other aquatic organisms previously collected by the instructor. Preserved specimens may also be used. Detailed observations of one specimen are recorded in the process of producing a group field guide. A variety of classification systems for aquatic organisms, including functional feeding groups, preferred micro-habitat and water pollution sensitivity levels, will be discussed.

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**Learning Objectives** *To provide students with:*

1. experience making detailed field observations and classifying organisms.
2. enhanced understanding of key concepts.

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**Background Information** see preparatory, classroom lessons

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**Materials**

- previously collected live organisms in plastic container with aerator and/or preserved specimens
- banners depicting each of the major micro-habitats, a riffle, pool and run
- benthic macroinvertebrate and other aquatic organism identification guides
- hand lens and/or bug boxes
- seine net to model collection protocol
- re-used white plastic containers, ice cube trays and/or plastic petri dishes
- plastic tweezers, small paint brushes and spray bottle
- light colored shower curtain or plastic table covering
- organism description cards for the field guide the group will produce
- pencils and/or markers

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**Procedure**

1. After greeting the group, explain to the students when, where and how the aquatic organisms they are about to view were collected if known. Remind them that specific field protocol is used to collect bottom dwelling organisms when biological monitoring is being conducted.
2. Demonstrate the use of a kick seine and have the students observe the fine mesh of the net.
3. Provide a general overview of how the organisms are displayed.

## Procedure, continued

4. The students should be in small groups of five. Instruct them to divide further into one pair and one group of three to complete the station activity. Ask the students if they have researched any of the organisms that are present. Organism assignment may be based on prior knowledge or made randomly.
5. Remind students of the overall goal of having minimal environmental impact. Demonstrate how to use the paint brush to gently move a live organism to provide an altered view of its structure.
6. Instruct students to examine the animals found through hand lenses. Carefully inspect their mouths, legs and other features. Each student group should record observations of their assigned organism, consult reference materials as needed and complete a description card for the group field guide.
7. If time permits, have each group (or a few volunteers) share the information on their organism cards. Explain that the cards will be bound into a booklet to be used back at school.
8. Review adaptations that are commonly found in stream organisms. Capitalize on the physical features of the organisms that the group discovered. In stream/river environments, adaptations often include body features that help them stay in place in the swift moving water, gather food from the moving water and breathe underwater (gills). Remind students of the other ways macroinvertebrates can be classified or divided into groups (i.e. pollution tolerance level, preferred microhabitat, feeding groups). Decide as a group, how the field guide will be organized.

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## Reflection

*Appropriate concluding questions would be:*

- What was your reaction to seeing a live or preserved specimen of the organism(s) you studied in class?
- Were they different from what you expected? If so, how?

In addition, the field guide pages can be assembled into book form for use with future classes. Students can discuss what other information would make them useful to the next group of learners.

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## Assessment

Student's level of participation during the field work and the accuracy and thoroughness of the field guide page his/her group produced can be used for assessment.

# Benthic Macroinvertebrate – Field Data Card

Organism's Name:

Microhabitat: *(location found, if known)*

Special Features/Adaptations:

Feeding Group: *(i.e. shredder, grazer, collector, if known)*

Water Pollution Tolerance Level:  
*(Group I – Intolerant, Group II – Moderately Tolerant,  
Group III – Tolerant)*

Macroinvertebrates – Data Card

Sketch

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Sketch