

Macroinvertebrate Research

Revised July 2010

GRADE LEVEL:

K-12

SUBJECT AREAS:

Science

DURATION:

60-90 minutes

SETTING:

Outdoors near a stream

LINK TO THE UTAH CORE CURRICULUM:

Science –

K-2:

Standard 1.1.1-5

Standard 1.2.1-2

Standard 4

Third Grade:

Standard 2.1

ILO 1.a-d, f-h; 2.a, c;

3.a, c; 4.a-c

Fourth Grade:

Standard 5.2-4

ILO 1.a-d, f-h; 2.a, c;

3.a, c; 4.a-c

Fifth Grade:

Standard 5.2

ILO 1.a-i; 2.a, c-f; 3.a,

c; 4. a-c, e; 5.a; 6.a-c

Sixth Grade:

1.a-i; 2.a, c-f; 3.c; 4.a-

c, e; 5.a; 6.a-c

Biology –

(9-12):

Standard 5.3

ILO 1.a-e, g; 2.b; 3.a,

c, d; 4.a; 6.a-c

PURPOSE: To introduce students to macroinvertebrates through collection and observation.

SUMMARY: Students will learn to collect macroinvertebrates, observe and identify them.

BACKGROUND: The small animals living in water are called aquatic macroinvertebrates. These macroinvertebrates include many types of insects as well as other animals such as worms, mollusks and tiny crustaceans.

Many of the macroinvertebrates make their homes in riffles and pools of gravel-bed streams. By turning over stones and examining the underside, you may find aquatic macroinvertebrates.

MATERIALS:

Kick nets

Plastic pans (1 per 5 students)

Large transfer pipettes (1 per student)

Plastic petri dishes (1 per student)

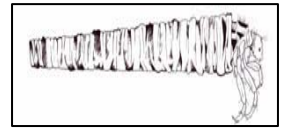
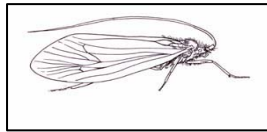
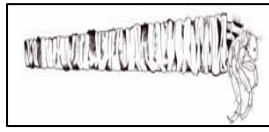
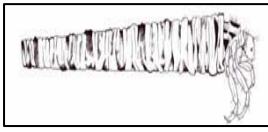
Magnifying glasses (1 per student)

Dichotomous keys

2 buckets

PROCEDURE:

1. Choose your sample site. Be sure to take into account the safety of your students (including factors such as air temperature) and accessibility to the area.
2. Explain to your students how to collect a macroinvertebrate sample.
 - a. One student will wade into the stream and place the net so the mouth of the net is perpendicular to and facing the flow of water.
 - b. Another student will stand upstream from the net and disturb the stream bottom with his/her feet and hands.
 - c. Students can carefully pick up and rub stones directly in front of the net to remove attached animals. The stream bottom materials and organisms will be carried into the net by the current.
 - d. Tell the students to continue this process until they see no more organisms being washed into the net.



3. Have the students hold the sample over a plastic pan, and use a bucket of stream water to wash the organisms into the pan.
4. Have the students sort and identify the macroinvertebrates using the transfer pipettes, magnifying glasses, petri dishes, and dichotomous keys.

A different “**family**” refers to animals that are related (e.g., all mayflies) but have enough different physical characteristics that they can easily be divided into separate groups. (See dichotomous key.)

Aquatic Invertebrate Group (Orders)	Number of different “families” found
Mayflies (Order Ephemeroptera)	
Stoneflies (Order Plecoptera)	
Caddisflies (Order Tricoptera)	
TOTAL	

Total “families” equals EPT Value:

- > 10 Not affected (excellent water quality)
- 6-10 Slightly affected (good water quality)
- 2-5 Moderately affected (fair water quality)
- <2 Severely affected (poor water quality)



EXTENSION: Have students rate the quality of the water using the EPT Value (or Water Quality Rating Index) found above. Sample other sites for comparison. Discuss what is different or similar between sites.