



Grade 8 – Water Quality Field Study

Curriculum Connection

- Grade 8 Science- Fresh and Salt Water Systems
 - Outcomes for Science, Technology and Society- 3 & 4

Objectives

- Students will investigate the type of organisms found in an environment and link adaptations to the environment.
- Students will analyze the relationship between living things and the quality of their environment and will make conclusions on the quality of water based on the types of life that are supported within.
- Students will look at the impacts of human use of water quality and determine how these impacts can be lessened.

Lesson/Activity Duration

- 1 class period for collection
- 1 class period for macroinvertebrate identification

Materials Needed

Thermometer	Nets
Buckets/Trays	Brushes (various sizes for collecting)
Ice cube trays (for isolating/sorting)	Macroinvertebrate identification keys
Magnifying glasses	Gloves
Sieves or dip nets	

** Many of these materials can be purchased relatively inexpensively at a dollar store.*

Background Information

All equipment and safety issues should be reviewed prior to departure.

The vocabulary and concepts should have already been covered so that this activity can be used as an application of those concepts.

Important Vocabulary

- Riparian Area - the green areas around a body of water, including grasses, shrubs and trees
- Macroinvertebrate - an organism without a backbone large enough to be seen without magnification

Procedure

- When choosing a body of water, depth should be considered as students will need to collect data from the bottom.
- Students should be divided into groups of 3 or 4 students
- When determining temperature, the thermometer should be left in either the water or air for several minutes before recording the temperature.



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- Students should collect macroinvertebrates from three different areas of the body of water. For collecting at the surface or mid-column, the net should rest in the water and then be lifted out. The net should be emptied into either a bucket or a tray for sorting at a later time.
- When collecting insects from the bottom of the body of water, a student will need to enter the water. The net will rest on the bottom and the student will pick up rocks and other debris and gently scrape the surface of the rocks in front of the net with the brush. The net should be emptied into another tray.
- Be sure to keep the samples from each area labeled and separated.
- If time permits, students could do sampling in more than one area. For example, they could get samples along the riverbank, as well as halfway across the river.
- Back in the classroom, the sorting can begin by removing any larger particles. Once those have been removed, the rest of the materials can be added to a sieve and rinsed until you are left with only macroinvertebrates.
- Using a dichotomous key, the invertebrates can then be sorted and identified.
- If you would like to save the samples for future reference, they can be stored in glass bottles preserved in alcohol.

***For more information on Alberta-Pacific's aquatic research programs or the Water / Effluent treatment process, [click here](#).*

Water Quality Investigation
Grade 8 Science- Fresh and Salt Water Systems

Date: _____

Group Members: _____

Recorder's Name: _____

Name of Monitoring Site: _____

Name of Nearest Town: _____

WEATHER

clear
 overcast
 snow

partly cloudy
 drizzle
 sleet

cloudy
 rain
 other

Weather last 48 hours: _____

Air Temperature: _____

Water Temperature: _____

1. Is your monitoring site

natural

human-made

changed by humans

2. What types of plants are growing in the riparian area?

grassy plants

shrubs

trees

crops

lawn

no plants

3. What types of plants are growing in the aquatic habitats?

underwater plants

floating plants

no plants

plants growing out of the water

algae

AQUATIC MACROINVERTEBRATES

Collect macroinvertebrates from 3 different areas in a body of water (water surface, mid-column, bottom). Draw an accurate representation of the different types of organisms that were collected. Look at some of the adaptations the organism has to the environment where it was found. Determine the species using a dichotomous key and record the how many of that species you found.

LOCATION	DIAGRAM	ADAPTATIONS	SPECIES	NUMBER

Determine the quality of water based on the macroinvertebrates that were collected. Count the number of each type of organism and record it in the chart. Multiply the value that you have in the total number row by the biotic value. Record the number in the total points row. Add all of the total points columns to come up with a total. Compare your total with the index to determine the quality of water.

	Pollution Sensitive	Somewhat Pollution Sensitive	Pollution Tolerant
	Stonefly, mayfly, caddisfly, water penny, riffle beetle	Damselfly, clam, planarian, dragonfly, midges, beetle, black fly	Leeches, snails, roundworm, midge
Total Number			
Biotic Value	x 5	x 3	x 1
Total Points			

TOTAL: _____

INDEX:

Excellent- > 35

Good- 30-34

Fair- 20-29

Poor- < 20

Conclusions:

1. Is there anything in the area that you can see that might be affecting water quality in this body of water?

2. Is there anything humans can do to improve or protect the quality of this water?
