Water Ecology - Macroinvertebrate Camp Fraser

(modified for virtual field trip)

Overview:
Students will explore (through video) streams and small bodies of water in the Potomac River watershed with nets and magnification tools to discover what organisms live in the water and assess the water quality based on their findings.

Learning Objectives:
Students will be able to …

- observe sampling and identify characteristics of aquatic life to determine water quality
- observe aquatic life in its natural habitat and make connections to the watershed and the effects of human impact

Sequencing:
This supports the outdoor field experience element of the Meaningful Watershed Educational Experience (MWEE). During distance learning, this lesson will serve as one investigation into the watershed topics introduced in other lessons. Alternatively, this lesson could serve as an introduction to skills needed for on-site sampling.

Lesson Components:

Grade(s)	4-5th grade science
Time Required	30 minutes
Location(s)	Classroom or virtual lesson at home
Materials	Macroinvertebrate Assessment Video Photo of Macroinvertebrate and Water Monitoring Sheet

Next Generation Science Standards supported by this lesson:

Performance Expectation:

5-ESS3-1	**Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.**

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods. • Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem. (5-ESS3-1)	ESS3.C: Human Impacts on Earth Systems • Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. (5-ESS3-1)	Systems and System Models • A system can be described in terms of its components and their interactions. (5-ESS3-1) --- *Connections to Nature of Science* Science Addresses Questions About the Natural and Material World. • Science findings are limited to questions that can be answered with empirical evidence. (5-ESS3-1)

Preparation:

Students should come to the lesson with a background understanding of watersheds.

Vocabulary:

Term	Definition
Watershed	An area of land that drains into a particular body of water.
Macroinvertebrate	Organisms without a backbone that are visible without a microscope.
Pollutants	Substances that pollute something, especially water or the atmosphere.
Ecology	The scientific study of how organisms interact with each other and with their environment.

Procedure:

Action	Notes
Engage	
1 Before watching the video, remind students of any Issue Definition lessons you have already completed about watersheds. Today we are going to explore a body of water connected to our own watershed as we watch a video from Camp Fraser.	Also, if time or systems do not allow, students can watch the video without the discussion questions.
2 Check for student understanding on watershed concepts. If needed, have students model a watershed by creating a hill with their fists and visualizing what happens when it rains. Define watershed and let students know we are in a	

watershed at home, at school, etc. Make connection that the water is a reflection of what is happening on the land. How does trash end up in the water here? If they drop a candy wrapper in their neighborhood, how could it end up in the River? Or the Bay? Or the Ocean? How would that affect the animals that live in the water?	
Explore	
3 Watch the video to observe the sampling and identification of macroinvertebrates.	
Explain	
4 Let's review what we saw. What kinds of macroinvertebrates did you observe? What did their sensitivity tell us about the water at Camp Fraser?	
Elaborate	
5 Students should try to identify another macroinvertebrate on their own. Using the picture and Water Monitoring Sheet provided, ask students to compare and identify a macroinvertebrate we found. What does the presence of that macroinvertebrate tell us about the water quality?	Make connections to rest of the MWEE project.
6 What is happening in the water? What could affect the water? What could humans do to protect the water and animals in their own watershed?	
Evaluate	
7 How can you help to keep the water clean? Think about people you have seen in your community. MWEE students – Brainstorm new solutions that you can do by yourself and solutions that you would need help to do.	