8th Grade Unit: Macro to Micro, a Look at the Salish Sea Watershed

Objectives

Over the course of this unit students will:

- Create a model of run-off pollution in a watershed system and its effects on the organisms within it.
- Define problems of watershed resilience and take action to improve their impact on the ecosystem.
- Observe the relationship between water quality and organism population.
- Assess how water quality impacts organism populations in an ecosystem.
- Understand the concept of indicator organisms
- Learn basic life history information on the marine mammals of the Salish Sea.
- Learn about potential hazards to marine mammals living in the Salish Sea and potential solutions.
- Design solutions to minimize human impacts on watershed health.
- Design a monitoring plan for assessing the health of a waterbody

Background

This unit focuses on the human impacts to the biology and chemistry of the Salish Sea Watershed. The structure of this unit was based on the integration into the Carolina Biological Macro to Micro lessons as a way to further the scaffolding of GSSC lessons into the Blaine School District curriculum. The goal of this unit is to empower students to become stewards of their environment and become more familiar with the ecosystems in their backyard.

Lesson	**Time**
Paper Watershed Model	30 minutes
Aquatic Microscopy	90 minutes
Cain Creek Water Quality and Macroinvertebrates (walking field trip)	30 minutes
Marine Mammals (WMMSN led)	120 minutes
Watershed Design	30 minutes
Unit Reflection	10 minutes

Next Generation Science Standards

Performance Expectations
MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. [Clarification Statement: Emphasis is on cause and effect relationships between resources and growth of individual organisms and the numbers of organisms in ecosystems during periods of abundant and scarce resources.] MS-LS2-3: Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. [Clarification Statement: Emphasis is on recognizing patterns in data and making warranted inferences about changes in populations, and on evaluating empirical evidence supporting arguments about changes to ecosystems.] MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

Scientific and Engineering Practices	Disciplinary Core Ideas	Cross-cutting Concepts
Asking questions and defining problems Obtaining, evaluating and communicating information Analyzing and interpreting data Engaging in argument from evidence Developing and Using Models Constructing explanations and designing solutions	LS1.A: Structure and Function LS1.C: Organization for Matter and Energy Flow in Organisms LS2.A: Interdependent Relationships in Ecosystems LS2.B: Cycle of Matter and Energy Transfer in Ecosystems LS2.C: Ecosystem Dynamics, Functioning, and Resilience ESS3.C: Human Impacts on Earth Systems	Stability and change Patterns Cause and effect System and system models Energy and Matter Scientific Knowledge Assumes an Order and Consistency in Natural Systems Influence of Science, Engineering, and Technology on Society and the Natural World