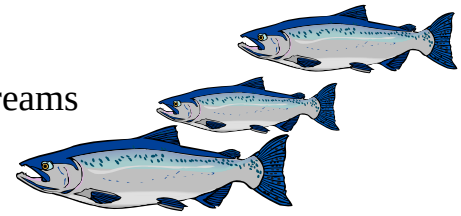
Project

Students

Watersheds

Invertibrates



Streams

Habitats

Project Swish, An Educational Approach To Watershed Stewardship Sponsored By

CLEAN WATER FOGH FRIENDS OF GRAYS HARBOR HEALTHY ESTUARY

A Special Thanks
to the
Following
For Making
Project SWISH
A Reality

Victor Garcia, Ocosta School District
Hannah Merrill, Grays Harbor Model Watershed Project
Gregory Books, Aberdeen School District
The Seattle Public Theatre
Brady & Happy Engvall, FOGH

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Project Overview & Background

Organizational Information

FOGH is a broad-based citizen's group made up of crabbers, fishers, oyster growers and caring citizens. The mission of FOGH is to foster and promote the economic, biological, and social uniqueness of a healthy Grays Harbor estuary. The goal of FOGH is to protect the natural environment and human health in Grays Harbor and vicinity through science, advocacy, law, activism and empowerment. FOGH is recognized by the IRS as a 501(c)3 exempt organization.

Development and original financing of Project SWISH was under the supervision of
Brady Engvall, Board President, FOGH, (360) 268-5518 broyster@techline.com
Arthur (R.D.) Grunbaum, Board Member, FOGH olearycrk@aol.com
FOGH (Friends of Grays Harbor, Post Office Box 1512, Westport, Washington 98595-1512, (360) 648-2254
Funding provided by the City of Aberdeen through a Supplemental Environmental Project (SEP)

Project Partners

The project partnered with the following during the development and demonstration phase of the project:
FOGH (Friends of Grays Harbor)
Chehalis River Council (CRC)
The Ocosta School District
The Aberdeen School District
The Grays Harbor College Model Watershed Project
The Grays Harbor College Education Department
The Seattle Public Theater
The City of Aberdeen

Project SWISH Statement

(Students, Watersheds, Invertebrates, Streams & Habitats)
Project SWISH helps increase students awareness and knowledge about environmental issues of water quality and provides the skills to make informed decisions and take responsible actions. The project does not advocate a particular viewpoint or course of action. Instead it teaches individuals how to weigh various sides of an issue through a critical thinking process and enhances the students own problem-solving skills. Hands-on science offers students direct opportunities to experience natural processes, cause and effect, study of the physical world, and endless concepts. However, these experiences are much more effective for students if they are offered in the context of familiar lessons and life experiences. Victor Garcia, Ocosta Jr. High Science Instructor, was inspired to create a unit to increase awareness of watersheds, water quality, and environmental issues by a Seattle Public Theater production he had seen. Victor recruited the assistance of Hannah Merrill, Grays Harbor

College Watershed Project, Gregory Books, Science Instructor, Aberdeen Schools and others. The proposal became Project SWISH. Using a multi-discipline approach, the Project blended theater, arts, journals, as well as science.

Due to limited school budgets teachers often need to seek outside funding for special projects. It is costly to hire buses to take students on field trips or purchase new equipment. Victor submitted his proposal to FOGH for grant funding of his project.

The project was approved and the team of educators created a month-long study unit to prep students in the concepts of water quality, watersheds and environmental issues. These concepts were built upon by taking the students to Grays Harbor College Model Watershed for a field day where they performed water quality tests, collected "bugs", studied and sketched aquatic macro-invertebrates, noted observations in journals, made leaf rubbings, keyed-out trees, toured the fish hatchery and clipped salmon.

To wrap-up the unit, the students attended an interactive theater production *The Incredible Undersea Trial of Joseph P. Lawnboy* by the Seattle Public Theatre. The play discussed the concepts and issues the students had already studied. Students had a question and answer time that followed the production and then evaluated the entire unit. The theater production brought the lesson full circle and was a wonderful interactive way to complete the unit

Project Description
Project SWISH begins in the classroom with studies and classroom projects lead by the instructor. It then moves to a field day at a Model Watershed and culminates in the attendance of an interactive theatrical production.

Utilizing the study guide provided by The Seattle Public Theatre, the instructors and students begin about a month before the production to explore a variety of themes: What is our connection with water and why is it important to study?; How do different people in your community value water?; What is the meaning of “stewardship” of water resources?; What is a watershed?; What is hazardous waste? What effect does the dumping of litter and hazardous waste have on your watershed? How much water do you use in an average day? Explain the hydrologic cycle (water cycle); How much of an impact (positive or negative) can a single person’s actions have on your watershed? How about the actions of your entire class?

These are just a few of the subjects which were used as catalysts to discussion and the introduction of activities. Once the background information has been presented the students are then invited to experience some of the things they have learned by attending a day-long retreat to the environment. SWISH held their retreat at the Grays Harbor Model Watershed where they sampled the creek and collected “bugs” for study.

Aquatic Invertebrates are especially useful as monitoring tools to assess the health and quality of aquatic environments. The segment discusses the importance of “bugs” and points

out that this group also includes snails, worms, clams, crustaceans, and animals like hydra. It allows a discussion about groups of invertebrates which are classified as *shredders* (e.g., the stonefly, caddis larvae and isopods); *scrapers or grazers* (e.g., snails and the water penny); *collectors* of which there are two types, *filtering collectors* (e.g., freshwater mussels) and *gathering collectors* (e.g., larvae of water beetles) and *predators* (e.g., larvae of the dragonfly). Water samples are taken from a local creek. Observations of the above are made from the sampling by using a private eye lens or biological microscope. The student is asked to verbally describe what he/she sees and also is asked to identify and draw it showing as much biological detail as possible. The student is given a checklist with dichotomous keys of "life-sustaining" requirements for invertebrates and is asked to evaluate what is its pollution tolerance. Using a pollution tolerance list, the students are asked to determine whether their animal could survive in polluted waters.

The Riparian Zone is discussed and studied for its importance to the life cycle of salmon, trout and other fish species. It helps to form the connection between the plants, trees, bugs, animals, water, pollution and human activities. The students are given background information on the identification of various leaf structures and learn how all this provides "nutrient recycling" on a salmon stream. They identify and record the types of trees and forest in the area, analyze its diversity and report on its connection to stream and aquatic animals.

Water quality is studied through water quality testing. Tests kits are used to discover the pH, ammonia, nitrite, nitrate, oxygen, carbon dioxide and carbonate hardness levels of collected water samples. Students review cards that explain the water quality tests and what each one tests for and the significance of the test. Groups sample and perform the different tests on stream water, each student records results in a journal and decide whether or not the water is healthy. Each component is discussed for its importance to the health and function of the water body.

A visit to the hatchery at the site, provided time to learn about the salmon life cycle and hatchery management. The anatomy of salmon was studied and each student had the opportunity to clip the adipose fin to mark hatchery fish for future identification.

Students rotated through each learning station (with break for lunch, and time to walk between stations). The day began and ended with an all group meeting. The beginning meeting set the expectations, rules, review, and schedule for the day. Students receive name tags, journals, pencils and other relevant supplies. The day ended with review, request for highlights, collection of the journals, pencils and connecting this day to the theater production they'll view in the near future.

The students needed a framework to connect all the pieces. The groupings needed to be small. Education and natural resources students from Grays Harbor College were asked to

teach the lessons at the college. This was an excellent learning experience for the college students in teaching, and the Junior and Senior High School students responded to them well. Each group of students had two chaperones to transition with them from station to station. This kept the flow of the day smooth and provided needed supervision. Several additional support individuals to document the day, check-in with students and instructors, and provide the connection from the beginning of the day to the end, making the day run smoothly. Planning for the June field day event began in December. The participating teachers used the Seattle Public Theater Manual a month or so in advance to prepare their students. After the field day, the theater production brought the lesson full circle and is a wonderful interactive way to complete the unit.

The Incredible Undersea Trial of Joseph P. Lawnboy is a whimsical method of delivering hard questions and concepts about water quality. The story is told through a narrator who also serves as the judge of the trial. Additional members of the cast are: Joseph is a 34-year-old high school student who claims he's 17 because he's embarrassed for having flunked high school algebra year after year. Joseph loves to fish. Greta, an extraordinary fish with a penchant for opera. Fred, a deep diving loon who serves as prosecutor for the Water World in Joseph's trial. Darlene, Joseph's defense attorney is an articulate mayfly larva.

Joseph's passion for fishing leads him underwater, where he catches his foot in a submerged grocery cart. Although his U.B.A. (Underwater breathing apparatus) will sustain him for 15 minutes, Joe is forced to ask for help from an unlikely source: Greta, the very fish he was trying to catch.

Greta laughs at Joseph's request and signs a deeply moving aria ("numm-scullo-be feesh-fude), but then decides to give him a second chance. She calls her underwater friends, and Joseph finds himself on trial for "Crimes Against the Sea".

Will Joseph be condemned by the cold, hard facts and cheap courtroom tricks of the Prosection? Or will he be saved by the passionate pleas of his court appointed defense attorney? Anything is possible and the students are the jury who decide his fate!