

Oakland Museum of California Foundation (OMCA)

Water Striders Junior Guides – From Creeks to Coastline

Meaningful Watershed Educational Experience for Students

Partners:

Oakland Unified School District, Contra Costa Unified
School District

Target Audience:

Fifth grade students from three public schools.

High percentages of the student population at each
school are identified as English Learners.

Each school qualifies for school-wide Title I funds.

Goals

- To provide 90 Oakland inner-city fifth grade students with meaningful science learning experiences in the San Francisco watershed ecosystem.
- To provide the opportunity for 5th grade students to develop and practice skills in observation, critical thinking, communication, leadership and analysis.
- To increase students' awareness of and stewardship for their local natural environment and their role as humans impacting this environment.
- To enhance the educational value and scope of the museum's offerings by collaborating with Oakland Public Schools, local non-profit organizations, government agencies, parks and environmental education camps.

Objectives

- Students will be able to identify themselves as having a role in the physical landscape.
- Students will demonstrate knowledge of key concepts that make up a watershed ecosystem.
- Students can identify 3 – 5 animal and plant species and the role they have in a watershed habitat.
- Students will successfully communicate to younger students how humans can have a positive and negative impact on a watershed habitat.
- Students will demonstrate an increase in leadership, oral presentation, teaching, and language development skills.

Project Overview

The Water Strider Junior Guides Program is a museum/school project that provides watershed ecology instruction to inner city 5th graders over the course of an academic year. Museum teachers provide classroom instruction, teacher support, and lead four field trips which follow a transect of local watersheds from creek to saltmarsh to San Francisco Bay and out to the coastline.

Field Trip Experiences

Over several months, students traveled to four watershed habitats:

- 1) *San Leandro Creek:*** Each class participated in a day-long series of creek explorations hosted by Canyon School, Contra Costa Unified School District. Students conducted water tests, surveyed plants and animals, wrote poetry and and practiced biological illustration.
- 2) *San Francisco Bay:*** Each class took a boat trip with *Marine Sciences Institute*, learning about plankton, benthic ecology, ichthyology, and hydrology.

- 3) *Arrowhead Marsh, Oakland:*** Each class surveyed saltmarsh flora and fauna, tested water flow, temperature and salinity, created poetry and illustrations inspired by the saltmarsh, and participated in garbage clean-up.
- 4) *Tide Pools, Half Moon Bay:*** All classes completed their field trip series with a trip to the tide pools at Half Moon Bay, Students explored the intertidal zone, tested water temperature and salinity, and participated in garbage clean-up.

Peer Teaching

Following the field trip series, each class attended four junior docent training sessions at OMCA's Natural Sciences Gallery. Guided by experienced adult docents, students drew correlations between their field trip experiences and the museum exhibits, to create oral presentations. Students then gave tours to over 150 younger students from their schools.

Sharing with the Public

Student work (illustrations, journal entries, poetry, individual watershed species' reports) and photos from the field trips were incorporated into a small museum exhibit on display in the Natural Sciences Gallery to show parents and other museum visitors the impact of the program on the 90 fifth grade students.

A culminating family celebration at the museum allowed students to share with their parents their newly acquired knowledge of watershed habitats and confidence in giving museum tours.

Evaluation Plan

In our evaluation plan, we wanted to know four ways the program effected students.

- Did the field trip experiences and peer teaching activities increase student knowledge about local habitats in local watersheds?
- Can the students identify positive and negative impacts humans have on these habitats?
- Can students identify the physical components that comprise a watershed system?
- Did students' leadership skills and oral presentation skills increase?

Methods/Tools

Quantitative

Saltmarsh Habitat Drawing Activity: Pre- and post- field trip activity in which students draw their conception of a saltmarsh. “Star” activity in which students identify negative human impacts on the habitat.

Tour Observations: Students are observed while giving oral presentations to younger students. Classroom teachers observe and comment on their own students using a set rubric. Objective observers assess students’ delivery against a set rubric

Qualitative

Student Exhibition: Students’ perspective of watershed habitats through poetry, illustrations, species reports, photos, video, and soundscape.

Products

- Creek student guide – Tool used to study the creek habitat.
- Saltmarsh student guide – Tool used to study the saltmarsh habitat.
- Tide Pool Transect Activity – Students are introduced to and synthesize the concept of tide pool species zonation.
- Gallery Presentation Worksheet – Students synthesize their field trip experiences with museum exhibits to create a teaching experience.
- Student Exhibition – Visitors view local watershed habitats from the students' perspective through photos, poetry, biological illustration, quotes, video and soundscape.

Results - Quantitative

- We were partially successful in increasing student knowledge through field experiences as evidenced by the saltmarsh field trip drawing activity. Two schools showed an increase of 10% and 16%.
- Results from a Formal Tour Observation assessment, implemented by objective reviewers, indicate students demonstrated a range of knowledge of facts about the watershed, with knowledge of animal and plant species and how water supports life in any habitat being most frequent.

Results - Qualitative

- Qualitative evaluation results include video interviews showing students describing how a saltmarsh is part of a watershed system, student poetry and illustrations generated on field trips, and watershed species science reports.

School:	pre- test (overall percentage of students demonstrating knowledge of animal species, plant species, geography, and human impact)	post-test (overall percentage of students demonstrating knowledge of animal species, plant species, geography, and human impact)	Percent change (average)
Lincoln	41%	50%	10%
La Escuelita	32%	48%	16%
Glenview	48%	39%	-9%
Average of all three schools	40%	46%	6%

Changes to Evaluation Plan

Tighten procedures – administer all assessment consistently. For example, make sure the post-test salt marsh drawings are administered as close as possible to the field trip experience.

Add a survey of student attitudes to assess current knowledge of local water flow and personal values about nature.

Add an interview component to tour observations to better measure student knowledge.

Changes to Project

Instruction – Incorporate more English Language Development (ELD) techniques in classroom teaching. Emphasize physical geography of watershed to help connect field trip, classroom and museum exhibit study. Simplify expectations for what students can accomplish in limited classroom time.

Field trips – Modify expectations for field trips by simplifying water testing activities and adding physical watershed modeling at beach.

Prototype shorter program offering – retain key goals and objectives in a program that requires less time commitment from schools. Assess quality of experience and impact with resources expended.