

Ocean Science Explorers Initiative

Initiative Outcomes

Ocean Discovery Institute verifies program success based on the outcomes of quantitative and qualitative evaluations led by Roxanne Ruzic, Ed.D., a contracted specialist in educational research. Dr. Ruzic received her doctorate in education from Harvard University. She is an education and research consultant and teaches graduate level courses in research methods for Chapman University.

Content assessments, attitudinal surveys, and interviews were administered and are being entered and analyzed. In addition, student and teacher participation information is tracked. **The final evaluation results will be available in our annual evaluation report in January 2010.**

Each project goal as described in the grant application is listed with outcomes for each recorded below.

Goal: Increase interest & participation in the sciences

Outcomes:

- 2 additional elementary schools and 2 additional middle schools, in City Heights were provided with the program.
- 1,903 students participated in the program.
- 15,789 total educational hours were provided.
- 60 teachers participated in professional development.
- 60 classrooms received books and science materials.

Goal: Increase performance in science

Outcomes:

- Pre- and post-content assessments were administered to program participants to measure science performance.

Goal: Increase interest and engagement with the natural world

Outcomes:

- 1,903 students participated in a field-based experience to a natural setting.
- Pre – and post-interviews and surveys were administered to program participants to measure interest in natural habitats.

Goal: Increase diversity among those who support and act for the benefit of the environment

Outcomes:


- 1,903 students participated in an environmental action related to their unit of study.
- 782 student-created conservation campaign buttons were created and distributed to the 6th grade participants to raise awareness around their conservation efforts.
- 30 bags of trash were removed from students' neighborhood canyons and streets.
- 24 storm drains located adjacent to students' schools were painted with "No Dumping...I Live Downstream" signage.
- 90 native species were planted in canyon habitats.
- Two trails within local canyons were improved.
- 412 2nd grade youth were mentored by their 5th grade peers in how to make positive environmental decisions.



Initiative Narrative

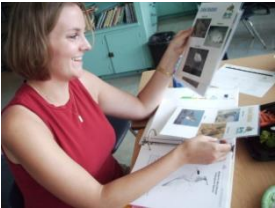
Ocean Discovery Institute **provided classroom-based, experiential science education to 1,903 low-income students and 60 teachers**, including professional development for classroom teachers, hands-on activities, thematic curriculum, books and materials, a field experience to study conservation concepts and an environmental service project that students implement at the completion of the program.

The initiative was expanded to reach four new schools this year. In total, the program was provided to **all 3rd through 6th grade classes at four elementary schools and four middle schools** in low socio-economic status communities. Curriculum is grade level specific, with different curriculum units and activities for each grade.

Each Unit Incorporates:

<p>In-Class Activities</p> 	<p>All students participated in four to five hands-on, interactive, standards-based science lessons in their classrooms led by Ocean Discovery Institute staff. Interactive program content introduced students to science in genuine ways, helping them make connections between science and their own lives and communities.</p> <ul style="list-style-type: none">• 3rd Grade: Students became "<i>Invert Investigators</i>" learning about invertebrate adaptations to the rocky seashore habitat and how coastal habitats are linked to inland neighborhoods.• 4th Grade: Students became "<i>Wetland Avengers</i>" learning
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	<p>about the importance of the wetland ecosystem and its functions.</p> <ul style="list-style-type: none"> • 5th Grade: Students became “<i>Research Scientists</i>” performing experiments, exploring the scientific process, and learning about the multitude of scientific careers. • 6th Grade: Students became “<i>Time Travelers</i>” using geologic evidence to discover what the Earth was like in the past and the forces that are shaping its future.
<p>Field Exploration</p> 	<p>All students participated in one science focused field trip led by Ocean Discovery Institute staff, offering a venue for experiential learning of science content and an opportunity to explore local coastal resources. Field-based learning allowed students to apply their knowledge gained in the classroom and to understand the relevance of science.</p> <ul style="list-style-type: none"> • 3rd Grade: Students tide pooled to discover invertebrate behaviors and adaptations in the rocky seashore habitat and conducted quadrat analysis to assess biodiversity. • 4th Grade: Students explored wetland habitat at the Chula Vista Nature Center. • 5th Grade: Students looked in-depth at the bay through running experiments testing animal adaptations, performing DNA analysis to identify plankton, and analyzing water quality. • 6th Grade: Students visited the Birch Aquarium where they used visualization technology to “fly” over the Earth’s ocean and understand plate tectonics. They also simulated coring techniques to study microfossils.
<p>Environmental Service</p> 	<p>All students participated in a locally-based environmental service project related to the science curriculum and led by Ocean Discovery Institute staff. By participating in locally-based environmental projects, students gained the belief that they can make a difference, encouraged others to participate in stewardship and increased everyone’s ability to increase quality of life within highly urbanized communities.</p> <ul style="list-style-type: none"> • 3rd Grade: Students conducted a street cleanup in their neighborhood and painted storm drains with “No Dumping” signs emphasizing how local actions in urban communities affect their neighborhood environment and tidelands. • 4th Grade: In partnership with the San Diego Canyonlands, Inc. students worked with community volunteers to conduct habitat restoration in an urban canyon neighboring

	<p>their school. Restoration activities varied depending on each canyon’s needs and included planting 90 native species, collecting and dispersing native plant seed, trail maintenance, and removal of 10 bags of trash.</p> <ul style="list-style-type: none"> ● 5th Grade: Students mentored younger students while playing the “Save Our Island!” board game which requires them to make good environmental decisions. ● 6th Grade: Students designed buttons to encourage others to conserve resources and to reduce, reuse, and recycle. Buttons were distributed to all students participating in the program.
<p style="color: orange; text-align: center;">Classroom Teacher Support</p> 	<p>In order to increase the number of teachers who provide quality hands-on, interdisciplinary science education to their students in the early grades, Ocean Discovery Institute provided activities to increase teachers’ comfort and facility in science. All teachers received supports and classroom materials to enrich and extend their students’ science and literacy learning.</p> <ul style="list-style-type: none"> ● All teachers participated in a curriculum-based professional development workshop led by Ocean Discovery Institute. ● Sixth grade teachers participated in a science-based professional development workshop led by a Scripps Institution of Oceanography scientist. ● All classroom teachers received standards-based lessons linked to the hands-on science activities for use in their classrooms. ● All classroom teachers received theme-related books for use with the curriculum units, enabling them to meet language arts requirements. In addition, all sixth grade teachers received a science kit for use with the curriculum units enabling them to provide hands-on scientific learning experiences.

Enhancements

This year Ocean Discovery Institute utilized the results of previous years' program evaluation to create a comprehensive plan for curriculum enhancement. The plan was designed to ensure that we are exceeding all program goals and best meeting teacher and student needs. This guide is being used to assess all curriculum units and direct enhancement efforts. To date, the 3rd grade unit has undergone assessment and changes and will be ready for use in the next academic year. Enhancements include:

- Incorporating nature in students' neighborhoods into lessons across all grade levels.
- Adding urban ecology lessons to teacher's thematic curriculum to tie science in student's community to the tidelands.
- Broadening the range of sciences to which students are exposed.
- Linking curriculum to Environmental Education Initiative and National Science Standards.