WHAT DOES THE HYDROVILLE CURRICULUM PROJECT OFFER?

The Hydroville Curriculum Project was developed to improve high school students' academic performance and stimulate interest in problem-solving, environmental health science, decision making, teamwork and social responsibility. The curricula use environmental health topics to enhance connections between science, language arts, math, social studies, health and technology.

The Hydroville Curricula offer three different scenarios that focus on environmental health issues: (1) a pesticide spill; (2) an indoor air quality problem; and (3) a water quality problem. The activities were developed by scientists and master teachers in science, engineering, mathematics, language arts and social studies, and are aligned with National Standards. These curricula represent a departure from the traditional high school science curricula because they are

- **Interdisciplinary:** Curricula integrate life and physical sciences and incorporate concepts in mathematics, language arts, social studies, health and technology.
- **Based on inquiry:** Each curriculum was developed using a problem-solving framework designed to guide teachers and students through an investigation reflecting how scientists and experts solve real-world problems.
- **Open-ended:** Students learn that solutions are often tempered by stakeholder values and monetary considerations, and there can be multiple solutions.
- **Research-based:** Activities incorporate scientific technology, techniques and instruments currently used in today's research laboratories.

CURRICULA COMPONENTS

- **Introduction:** A 10-minute video that introduces the problem, stakeholders and community history
- **Background Activities:** Hands-on activities that provide concepts and skills needed to solve problem
- **Expert Areas:** Opportunities for students to roll play as professionals such as soil scientists, toxicologists, engineers, chemists, industrial hygienists, and occupational physicians.
- **Team Meetings:** Scheduled time for student teams to develop teamwork skills and to analyze and synthesize data and develop hypotheses. Teams decide if a problem exists, discover the causes of the problem, identify environmental hazards, brainstorm solutions and present recommended actions.
- **Solution Presentations:** Student teams make formal presentations of their remediation plan to audiences representing the stakeholders in the Hydroville problem

Scenario Descriptions

Pesticide Spill

A tanker truck carrying a pesticide overturns near Beaver Creek which supplies drinking water to the town of Hydroville. Student teams, representing an environmental clean-up firm, assess the spill site, develop a remediation plan for the site and present their findings at a town meeting.

Recommended for 9th grade Integrated Science or Physical Science

Indoor Air Quality

Occupants in a newly remodeled school building report illnesses and complain of odors. Students role-play as a consulting team of air quality professionals to determine if there really is an indoor air problem in the school. Students then present their recommendations to the Hydroville School Board.

Recommended for 10th grade Biology

Water Quality

The town of Hydroville is experiencing some of the social, political and environmental problems associated with rapid growth and development. Student teams investigate possible causes of the increase in contaminants in the town's water supply, develop various remediation action plans and present their recommendations to the city council.

Recommended for 11/12th grade Environmental Science or Chemistry

HYDROVILLE WEBSITE: www.hydroville.org

On the Hydroville Website you will find:

- Downloadable sample activities from the Hydroville Curricula
- Curriculum descriptions, tables of content and concept maps
- On-line resources for each curriculum
- Links to pertinent environmental health resources

Hydroville Curriculum Project

WHAT IS THE HYDROVILLE CURRICULUM PROJECT?

The Hydroville Curriculum Project (HCP) is funded by a grant from the National Institute of Environmental Health Sciences. The mission of the HCP is to enhance high school students' awareness, interest and understanding of the cause-effect relationship between the environment and human health. The study of environmental health topics, such as water quality, indoor air quality and pesticides, is integrated with science, language arts, social studies, math, health and technology. The curricula are structured to help students understand the complexity of environmental health issues and to emphasize that many real-world problems have no single correct answer.

The curricula feature environmental health issues based on actual occurrences. Students participate in a series of background activities to develop pertinent concepts and skills. With this background knowledge, students assume the roles of experts on a multidisciplinary team. Teams develop their solutions based on data collected through laboratory experiments, interviews, research and interaction with experts. The teams then formally present their solutions to the problem.

"My ultimate goal is to use environmental sciences to help people live longer and healthier lives."

NIEHS Director Dr. David A. Schwartz

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Oregon State University

NIEHS

"We saw our students do wonderful things as we implemented the program. We have never seen our kids work so well together and put so much into their schooling. I think it just opened a new way of teaching for us teachers…how good we could be when we all worked together on a project like this. I will admit that we were hesitant to begin the water quality scenario, but after seeing the results, we are jumping at the chance to teach another one."

Stephanie DeBruyn, Social Studies, Woodburn Alternative School, Woodburn, OR

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Hydroville Curriculum Project

Integrated, problem-based environmental health science curricula for high school students

Hydroville, USA

www.hydroville.org