BOARDMAN LOCAL SCHOOLS: PROJECT STREAM

A COLLABORATIVE EFFORT:
BOARDMAN LOCAL SCHOOL DISTRICT AND ENVIRONMENTAL COLLABORATIVE OF OHIO
WHAT IS PROJECT STREAM?

The objective of Project STREAM is to provide a place-based science curriculum for Boardman Local Schools that focuses on studying water quality and local ecosystems through science activities that allow students to work alongside mentors in environmental science fields during hands-on learning through local stewardship projects. Working with environmental science professionals, participants are well-supported and guided to gain work and life skills within a context of place-based projects by observing, studying and assessing ecosystems in their local watershed. This program will mix all subject areas of STREAM (Science, Technology, Reading, Engineering, Arts & Math) allowing participants to take an interdisciplinary approach to place-based learning while being stewards in their communities. This approach celebrates individual strengths and allows for personal growth while improving students’ interests and learning outcomes in the sciences.

The objectives of the Project STREAM will be actualized by providing place-based, experiential learning opportunities for Boardman students throughout the year where they will:

- Learn the critical role water quality and soil play in the health of humans, wildlife and plants by regularly exposing them to hands-on learning with professionals in Environmental Science career fields
- Gain a heightened awareness of environmental justice issues that affect their communities
- Learn soil and water science concepts from Project WILD, and Project WET curriculum that align with Ohio Department of Education standards in science and other subjects
- Design a project with a team of peers in which they create a question around their community's water quality that they will study and observe throughout the school year
- Gain an understanding of civic leadership and environmental stewardship by taking part in conservation work throughout their community
GOALS & OBJECTIVES

INCREASE ENVIRONMENTAL LITERACY AND KNOWLEDGE IN TEACHER AND PROGRAM EDUCATORS:

- The program will train teachers on how to develop environmental science curriculum and perform field work and data collection dealing with water quality and habitat assessment. This will give the teacher hands-on learning experiences along with resources and activities that can be used for water quality education in the classroom and in the field. Giving all educators the same baseline training will assure that data collected during school field trips is science-based and credible.

DELIVER A COMPREHENSIVE PLACE-BASED, WATER QUALITY CURRICULUM:

- Expose students in grades 5-9 to a comprehensive place-based, water quality curriculum through environmental education programs that integrate school outreach and field trips. The program will be centered on community-based learning around the topic of water quality and the adjacent habitat and allow them to take part in water quality sampling and conducting stream habitat assessments (known in the science world as QHEI, or Qualitative Habitat Evaluation Index, assessments).
PROJECT TIMELINE

The program will be broken into four semester units that have 7 subjects as they relate to water quality. With the programming we allow for some flexibility in covering topics again or repeating certain activities we find relevant to complete our water quality sampling plan. We will work collaboratively with Boardman teachers and professional mentors to design and execute meaningful, place-based science curriculum that is integrated throughout the school year.

THE FOLLOWING TIMELINE OUTLINES THE 1.5 YEARS OF PROJECT STREAM PROGRAMMING WE ARE PLANNING:

OCTOBER - DECEMBER 2019
- CURRICULUM DEVELOPMENT
- CLASSROOM OUTREACH & FIELD TRIP SCHEDULING
- PURCHASE EQUIPMENT & SUPPLIES
- RECRUIT & SCHEDULE MENTORS

SEMESTER 1: INTRO TO STREAM SUBJECTS THROUGH INVESTIGATING THEIR LOCAL WATERSHED

JANUARY - MARCH: IT'S ALIVE!
- Teacher & Educator Trainings
- Classroom outreach for each grade
- BioBlitz on school grounds
- Team-building, leadership and learning-styles

APRIL - MAY: WE'RE CONNECTED
- Water, soil & local ecosystems
- Field Trips for stream & riparian survey
- Introduction to Student Design Project
- 2 career mentors during field trips and surveys

SUMMER 2020: TEACHERS AND PROGRAM EDUCATORS PLAN 2020-2021 SCHEDULE & CURRICULUM

SECURE ADDITIONAL FUNDING FOR THE PROGRAM GOING FORWARD FROM JANUARY 2021 AND ON
SEMESTER 2: OBSERVATIONS, DATA COLLECTION AND FIELD SURVEYS OF HEADWATERS AND ADJACENT HABITATS

SEPTEMBER-NOVEMBER 2020:
- Macroinvertebrate photographing
- Chemical PARAMETERS
- Netting and photographing fish
- Surveying for wildlife through photography and game cameras
- Legacy tree survey & Identifying
- QHEI assessment of sawmill run creek
- 10 mentor visits

SEMESTER 3: WATERSHED STEWARDSHIP DESIGN PROJECT

DECEMBER - FEBRUARY 2021:
- Decide on a place-based project question relating to the local watershed that will guide 2021 STREAM programming
- Review data, identify wildlife & plants photos
- 2 career mentor visits

SEMESTER 4: FIELD RESEARCH, REPORTS AND PRESENTATION

APRIL - MAY 2021:
- Field research collecting and organizing data
- Collaborating with mentors and industry professionals
- Analyze and interpret data to create a report and presentation
- Seek funding to expand to other grades
# BUDGET BREAKDOWN

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<th>EXPENSE TYPE</th>
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<tr>
<td>PROGRAM SUPPORT</td>
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EXAMPLE OF CLASSROOM CURRICULUM

SEMESTER 1

ODE: LIFE SCIENCE  HIGH SCHOOL

TOPIC: Diversity & Interdependence of life
This course investigates the composition, diversity, complexity and interconnectedness of life on Earth. Fundamental concepts of heredity and evolution provide a framework through inquiry-based instruction to explore the living world, the physical environment and the interactions within and between them.

CLASSROOM OUTREACH 1 THEME: DIVERSITY & INTERDEPENCE OF LIFE

Session 1 - view/handle specimens of bugs with microscopes and lenses along with high resolution images of macroinvertebrates from http://www.macroinvertebrates.org

Session 2 - Project WILD: Insect Inspection. Students learn how to identify insects and form investigative questions related to them and their habitat. Then students collect insects to observe, handle, photograph and then fill out an inspection data sheet to record their observations before releasing them.

Wrap-up Session - Project WET: Macro-invertebrate Mayhem. Students play an interactive game of tag that simulates the effect of environmental stressors in macro-invertebrate populations.
EXAMPLE OF FIELD TRIP CURRICULUM

SEMESTER 1
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FIELD TRIP SURVEY 1: DIVERSITY & INTERDEPENDENCE OF LIFE

Breakout Session 1 - Riparian hike photographing and recording plants, trees and other wildlife with technology. Students will be put into small groups and given certain species and points of interest to record.

Breakout Session 2 - Stream sampling and QHEI assessments. Students will use various pieces of equipment to sample and measure water quality parameters while also recording observations of stream habitat using QHI scoring sheets. Students will also use kick and dip-nets to catch fish and macro invertebrates that they will photograph and then later identify.