Ocean Acidification and Resilience

The Watershed Project is seeking teacher partners to pilot the teacher-led Ocean Acidification and Resilience curriculum with their students during the 2020-2021 school year! [Apply here]

About the Pilot Program
Ocean Acidification and Resilience provides a concise, yet in-depth, module designed to be easy for educators to integrate into their classes, accompanied by training and support from The Watershed Project educators. The inquiry-based, personally-relevant curriculum for Bay Area high school students is connected to Next Generation Science Standards, California Common Core Standards, and the Essential Principles for Ocean Literacy and Climate Literacy (see page 3 for details).

The Watershed Project is seeking teachers to pilot the curriculum with their students during the 2020-2021 school year and provide their feedback on it. At the conclusion of the pilot program, The Watershed Project educators will revise the curriculum based on teacher and student feedback and provide it freely on our website for all Bay Area teachers.

What are the benefits to participating?
Ocean Acidification and Resilience pilot program teachers will receive:

- No-cost lab supplies and equipment for hands-on labs that provide students with opportunities to:
  - Discover how carbon dioxide is formed through respiration and combustion using a carbon dioxide indicator, a balloon, and a candle.
  - Learn about the greenhouse effect using glass bowls, a thermometer, and a light source.
  - See firsthand how ocean acidification happens using red cabbage dye and a straw.
  - Investigate the impacts of ocean acidification on shelled organisms using oyster shells, solutions of water and vinegar, pH meters, and digital scales.
  - Find out how underwater plants absorb carbon dioxide using Elodea canadensis and red cabbage dye.
- Detailed lesson plans and all associated student materials.
- Two three-hour virtual training sessions with ongoing individual support.
- A $750 stipend.

Space is limited - apply now!

The Watershed Project’s mission is to inspire Bay Area communities to understand, appreciate, and protect our local watersheds.

If you have any questions about this program, please contact us at: education@thewatershedproject.org

Program Overview

In *Ocean Acidification and Resilience*, students investigate the guiding question, “How can we improve the resilience of the San Francisco Bay in the face of climate change impacts?” Through hands-on labs and experiments, data interpretation and analysis, and reflective outdoor journaling, students will understand their connection to the Bay, learn about the local impacts of ocean and coastal acidification, and become part of the solution in addressing climate change impacts on ocean life and communities in the Bay Area. At the conclusion of the program, students transform their knowledge into meaningful action to help mitigate climate change impacts.

Program Outline

- Lesson 1 - Connecting to the San Francisco Bay Ecosystem
- Lesson 2 - Introduction to Climate Change
- Lesson 3 - Introduction to Ocean Acidification
- Lesson 4 - Comparing and Contrasting Ocean and Coastal Acidification
- Lesson 5 - Impacts of Ocean Acidification
- Lesson 6 - Introduction to Climate Resilience
- Lesson 7 - Resilience in the Face of Ocean Acidification
- Lesson 8 - Climate Action Project

Program Goals

1. Students will make evidence-based claims about the causes and local impacts of ocean acidification.
2. Students will understand the concepts of personal resilience, ecosystem resilience and community resilience through research and reflection.
3. Students will participate in safe outdoor learning opportunities that connect them to local ecosystems and inspire stewardship.
4. Students will be empowered to take action to reduce climate change impacts on the Bay and ocean environments.

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Standards Connections

Next Generation Science Standards Practices
1. Asking questions and defining problems
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Next Generation Science Standards Disciplinary Core Ideas
PS1.B Chemical Reactions
PS3.D Energy in Chemical Processes
LS2.B Cycles of Matter and Energy Transfer in Ecosystems
LS2.C Ecosystems Dynamics, Functioning, and Resilience
ESS2.D Weather and Climate
ESS3.C Human Impacts on Earth Systems
ESS3.D Global Climate Change

California Common Core Standards

English Language Arts Reading
- 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
- 7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

English Language Arts Writing
- 1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
- 2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
- 3. Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

Mathematical Practices
- 3. Construct viable arguments and critique the reasoning of others.
- 4. Model with mathematics.

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