Resource Document

Creating a Virtual Engineering Service Learning Project - The Ameliators Program

This document is intended to supplement the slide presentation with condensed contact information and more examples for how STEM Community Service may be adapted to different formats.

Contact Information

EPICS (Engineering Projects in Community Service) - EPICS is a service-learning design program founded at Purdue University. It has a rich legacy and continues to be a robust program at Purdue. For the Ameliators program, college-age mentors attended trainings to learn how to teach the EPICS Engineering Design Process, and the EPICS curriculum inspired many aspects of the Ameliators Program. Training sessions for K-12 teachers are available, and upon completion of the training, you receive access to EPICS curriculum resources. More information may be found on their website.

EPICS Website: https://engineering.purdue.edu/EPICS
EPICS K-12 Outreach Coordinator: Charese Williams, charese@purdue.edu

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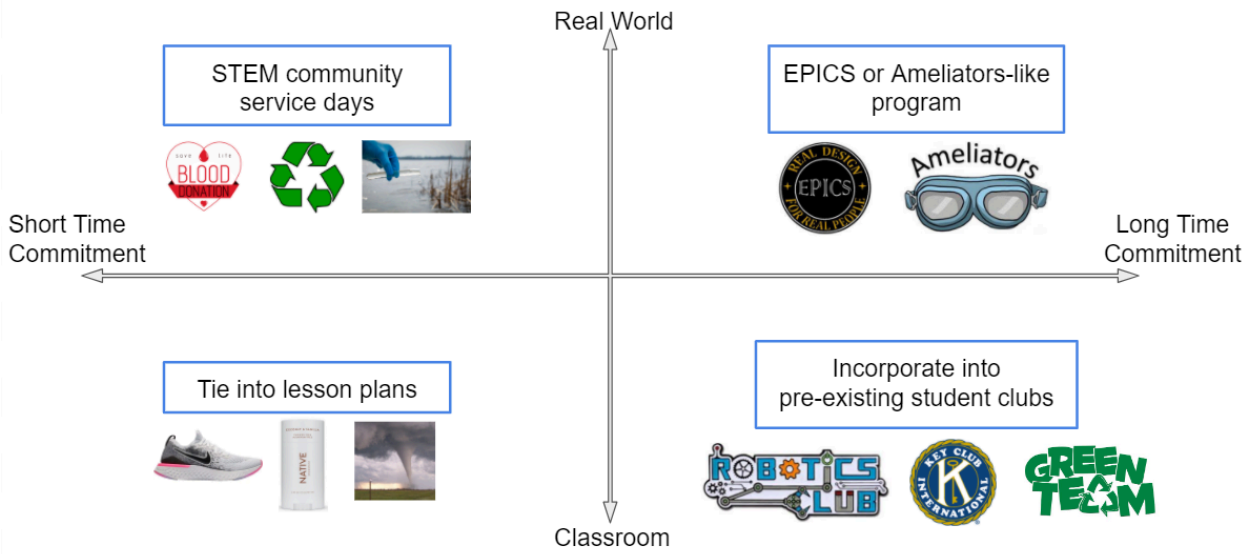
GEMS (Girls Excelling in Math and Science) Clubs - GEMS was founded by a Purdue alumna who wanted to encourage her daughter to become interested and stay involved with STEM. The result was GEMS Clubs. Today with a vast, nation-wide network, GEMS continues its mission, offers many resources for educators and club leaders, and is housed at Purdue University. For the Ameliators Program, GEMS and Stempower leaders worked together to design a program that would appeal to high school students, and the GEMS newsletter provided the advertising means for the program. Currently, GEMS and Stempower are designing a research study to understand the impact of the Ameliators program on its participants.

GEMS Website: https://gems.education.purdue.edu/
GEMS Email: GEMS@purdue.edu

Stempower is a Purdue University student organization that aims to empower the next generation of confident, resilient women in STEM through engaging mentorship and accessible education. Stempower works with a variety of community groups including the Girl Scouts, after-school programs, and schools to foster an interest in STEM through leading fun, hands-on activities. Programs offered include Girl Scout workshops and troop meeting activities, hands-on STEM activities for classes, “STEM” Pals programs, career panels and one-on-one mentorship for high school students, and of course, the Ameliators Program. If you are interested in the Ameliators, one of our other programs, or gaining insight for your own STEM endeavor, we would love to connect!

Stempower Website: https://stempowerpurdue.wixsite.com/stempower
Ameliators Program Head: Sam Land, lands@purdue.edu
Stempower President: Andrea Copeland, copela13@purdue.edu

What we hope you take away from our presentation is the idea of STEM Community Service, which may be accomplished in many ways. The Ameliators Program is only one example. Below offers ideas for how to adapt STEM Community Service to different formats.



STEM Community Service Days

Type of Service	STEM Connection
ALL types of community service	• Neuroscience - your brain on kindness • Data Science - measure and analyze your impact with metrics
Recycling, Waste Reduction	• Material Science - papers, plastics, metals • Process Engineering - visit the recycling sites, how are products broken down
Environmental Improvements - water testing, rain gardens, planting trees, etc.	• Environmental Chemistry • Microbiology - water quality • Agriculture - how crops affect surrounding environments • Ecology
Soup Kitchen	• Industrial Engineering - how to utilize resources effectively and efficiently • Logistics

	• Nutrition
Blood Drives	• Anatomy • Biomedical Engineering - devices used during blood collection

Project Examples for an EPICS or Ameliators-like Program

- Example Projects at School
    - Let students fix a problem that they complain about
    - Reduce waste or water usage - this could also save the school money
    - Increase lunch line efficiency or parking lot traffic jams
- Examples of community groups to work with
    - Habitat for Humanity
    - Neighborhood associations
    - Parks & Recreation
    - Environmental organizations
    - Animal shelters
    - Museums
    - Nursing homes
    - Local government
- Examples of community projects
    - Assistive technology for children or adults with disabilities
    - Neighborhood revitalization
    - Homelessness prevention
    - Website design for nonprofit
    - Building rain gardens, preventing water runoff
    - Create museum exhibit

Tie into Lesson Plans - brief mentions of how STEM can be seen in the real world

- pH → how deodorant works
- Biology + Electricity → pacemakers
- Chemical Processes → manufacturing medicine
- Calculus + Earth Science → intensity and direction of tornadoes
- Psychology + Data Science → User Experience and Marketing

- Physics, Material Science, + Anatomy → Athletic Equipment

Incorporate into Pre-Existing Student Clubs

- GEMS Clubs
    - Spark interest in younger girls by hosting a “STEM Expo” type of event
- Robotics
    - How can their robots do good?
- Community Service clubs like Key Club
    - STEM Community Service
- Best Buddies
    - Assistive technologies
- Environmental Clubs
    - Systematic, science-based ways that they can make a difference
- Athletics
    - Why equipment is designed the way it is, hydration, nutrition
- Student Government / Civic Service
    - Understand human psychology and how to make data-based decisions that improve policy