

# Water Design Challenge

*Developed by: Julianne Slogick & Jeff Holliday*

**Subjects:** Social Studies, Ecology, Environmental Science

**Estimated Time:** About 1 week of in-class work on each module, 1-2 days for culminating event, 1 day for reunion event

**Grade Level:** 9-12

## About This Lesson Plan:

What does it mean to be an active, engaged young global citizen? The Water Design Challenge asks students to explore real world water issues both locally and globally. The program has students collaborate as part of a “water task force” to tackle those issues in physical and virtual spaces while learning about civic engagement.

## About Mt. Lebanon School District:

The Mt. Lebanon School District is a nationally recognized and award-winning school district in suburban Pittsburgh, Pennsylvania. The district operates seven elementary schools (grades k-5), two middle schools (grades 6-8) and a high school (grades 9-12). The combination of a highly trained staff with educated and committed families results in students who achieve local, state and national honors in instructional, athletic and arts forums.

## Pro Tips:

This project is ideal for high school students, and it would work especially well in a social studies class or in an environmental studies class. Consider the organizations in your community who might be especially fruitful for your students to connect with, either at a large-scale culminating event or through a more modest guest-speaker opportunity in the classroom. What government offices, nonprofits, advocacy groups, and community organizations might have important insights to share? Use this lesson plan to help your students understand how deep local engagement can have a global impact.

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# Lesson Plan

## About This Module

This lesson plan delves most deeply into just one of several modules developed by Mount Lebanon School District. Visit the “student modules” section of [the district’s website for this project](#) to explore other thematic modules.

This particular activity, called “Module 3” in the original program, was one segment of a larger Water Design Challenge that was implemented during the 2015 school year. Module 3 serves as a good example of how teachers structured in-class learning activities in advance of the two-day summit (here called the “culminating event”) where students developed and refined solutions and presented them to a Shark Tank-style panel of experts.

The teachers who developed this lesson plan set out to re-imagine learning in a rapidly-changing, interconnected world by teaching about global citizenship through problem-based learning. The goal was for students across four school districts to design and create viral media campaigns tackling real world global water crises during a two-day concentrated learning experience in March of 2015. Working in design teams, students collaborated within physical and virtual spaces to create and pitch end products which tackled a specific real world global water crisis while fostering learning and encouraging collaboration and civic engagement. The goal was to share our experiences and processes with colleagues, peers, and any other entities who take risks and embrace the “messiness” of authentic, student-centered learning.

## Part 1: Introduction & Online Exploration

- **Introduction:**
  - **This module is entitled “The Crap People Put Up With.”**
  - In this particular learning module, students will be introduced to contemporary issues surrounding water and sanitation and waste management, an issue faced by communities across the globe. In order to hook students into the lesson and create a “need to know,” start by introducing students to an article that marked World Toilet Day from BBC News entitled [“In Pictures: My Toilet”](#).
- **Activity**
  - Next, invite students to explore the Internet and find an existing campaign that seeks to improve a sanitation/waste management issue in India.
  - Students are introduced to the following materials. Tell students that, based on what they learn from these materials, they will be asked to develop solutions that respond to inadequate sanitation in India.
  - Either share all resources with all students or assign each resource to small groups of students.
    - [Let’s Talk Crap: Seriously \(TED Talk by Rose George 2013\)](#)
    - [Modi Vows to Clean India by 2019 \(CSM, 2014\)](#)
    - [What’s a Toilet Worth? Infographic \(The World Bank, 2013\)](#)
    - [World Toilet Day 2015 Infographic \(UN, 2014\)](#)

## Part 2: Product Design

- **Prototype Design**
  - After students have explored these articles, students will work in small groups to create an original prototype or sketch of an idea for a product that would support the campaign's efforts.
- **Presentations**
  - After designing their prototypes, students should present their designs to the class. Students will submit a sketch communicating their public campaign idea and a short paragraph explaining their decision making process. If possible, they should share their product with other students. This is meant to help students with their metacognitive thinking while also considering all the various ways that different people will consider addressing the same problem.
  - Students should be prepared to describe how their product addresses the specific audience of people in India.

### **Part 3: Design Thinking Workshop & Idea Pitches**

- If you have multiple classes who have engaged in the same two-part process described above, **consider hosting a culminating event.** This event might take place over 1 to 2 days, and it might feature the following components:
  - Local speakers whose work relates to local or regional water issues
  - A design session, ideally rooted in human-centered design practices, where students break into groups and develop new product ideas based on what they learned from the speakers and from their prior research, with the added dimension of empathy-driven design thinking. Part of the Design Thinking process is to empathize with users, build prototypes, seek feedback, and use the feedback to revise final products.
  - A “Shark Tank”-style culminating presentation where groups pitched their end products to a panel of local experts. The Shark Tank would select “winning” student projects based on predetermined criteria, which they would share with participants in advance. The goal would be to showcase student learning by putting ideas into practice in the real world.

### **Part 4: Reunion & Debrief**

- Following the in-person event, consider bringing students together for a follow-up gathering. This event could take place up to a month after the culminating event, and it might involve the following components:
  - A debriefing of the main event
  - A discussion of the status of student work in the real world, if students chose to implement some of their ideas from class or from the culminating event
  - An opportunity to give feedback about topics and the format of future design challenges.

# Standards, Knowledge, Skills, and Understandings

## Content Standards

- Students will examine the relationship between access to adequate sanitation, health concerns, and socio-economic conditions in developing countries.

## Understandings

- **Overarching Understandings**
  - Globally, wide disparities exist with respect to access to sanitation, leading hundreds of million people to openly defecate. Students will consider how people's health around the world is often a reflection of the socio-economic environment surrounding the community in which they live.
- **Related Misconceptions**
  - Students may benefit from discussions about cultural norms surrounding cleanliness, privacy, gender roles, religious beliefs, etc.
- **Topical**
  - Public health concerns are most pressing in bringing attention to the global sanitation crisis, but there are other impacts that are important too. When people lack access to sanitation, they lose out on other opportunities, such as work and education.

## Knowledge

### Students will know...

- Basic facts about the global sanitation crisis
- Inadequate sanitation and open defecation are significant barriers to development and impede people's quality of life.
- The Indian government has implemented the "Clean India" campaign to address these concerns.

## Skills Specific to the Learning Plan

- NCSS/C3 “Cultural Competence”
  - Geography
    - D2.Geo.4.9-12. Analyze relationships and interactions within and between human and physical systems to explain reciprocal influences that occur among them.
    - D2.Geo.5.9-12. Evaluate how political and economic decisions throughout time have influenced cultural and environmental characteristics of various places and regions.

## PA State Standards

- 7.4: Interactions Between People and the Environment
- 8.1.12 Historical Skills and Analysis
- 8.4.12 World History (Continuity and Change)

## Skills Specific to the Unit

### Partnership for 21st Century Skills

- Learning and Innovation Skills
  - Communication
  - Collaboration
  - Critical Thinking
  - Creativity And Innovation
  - Presentation Skills
- **Information, Media, and Technology Skills**
  - Information Literacy
  - Media Literacy
  - “ICT” Literacy
- **Life and Career Skills**
  - Flexibility and Adaptability
  - Initiative and Self Direction
  - Social and Cross-Cultural Skills
  - Productivity and Accountability
  - Leadership and Responsibility