

**Subjects:** ELA, Mathematics, Science, Social Studies  
**Topic:** Design a Real Solution to an Issue in Your Community

## Grades 9-12 - Project Overview

### Purpose

Our cross-curricular unit provides a guide for students to solve a real problem in their community using skills and content knowledge including Mathematics, Science, English Language Arts (ELA), and Social Studies. We will use the Standards of Mathematical Practice to design and anchor each day's learning objectives.

Pennsylvania Department of Education (PDE) notes that, "*Standards of Mathematical Practice* are to provide learners with problem solving skills. Problems are not confined to the mathematics classroom. Throughout time, problems have been confronted by people."

We recognize that problems are not confined to any classroom or community, time period, or group of people. Every community across our nation could likely identify problems or issues that could be addressed and improved. We can always strive to be "more perfect." After all, our greatest patriots have often been those men and women who have broken down barriers, solved monumental problems, and fought for solutions to systems that weren't previously working for everyone.

### Summary

Students will begin this project by analyzing their own community with a critical lens. They will investigate the history, the physical space, the people, culture, health, safety, equity, and opportunities of their neighborhoods and communities. Identifying a problem or weakness is where we'll begin.

To help students understand the problem-solving process for community issues, we will provide lessons and activities to exercise these skills. For the sake of modeling the project's different options and visualizing the project's goal, we have chosen one possible focus that students may consider. We will help students design a "green space" to improve their community.

A green space is basically a designated area where nature and humanity cooperate, mindfully and intentionally, within what is otherwise an urban landscape. In short, green spaces tend to improve peoples' happiness, health, and constructive brain activity. Thoughts become clearer, breaths become fuller, connections become stronger, and physical activity becomes natural in a green space. Additionally, when built in place of abandoned buildings, the area becomes safer for our children and community members as well.

### Context Behind Our Example

In 1920, Johnstown, PA had a population of 67,000; in the 1970s there were over 40,000 people living in town. In 2020, the population is below 20,000. When a city's infrastructure is built for 40-70-thousand people but only 19,000 currently live there, it is inevitable that there will be

blighted (vacant, abandoned) homes and buildings. As time passes, these abandoned structures deteriorate and fall down, or attract trouble. Either way, they become dangerous and unattractive, and drive down property values for surrounding properties. A positive trend across the country is to revive depressed cities by tearing down blight and building green spaces.

### **Application of Knowledge and Skills**

This project will challenge students to take ownership and agency of their own communities and geographical spaces. Communities often thrive when young people are involved and invested in the work being done in the area. This project will also challenge students to use skills, knowledge, ideas, questions, formulas, and strategies from all content areas in order to solve real problems. No learning is meaningful except that which is generalizable and applicable. This means we will typically never see the same problem from our textbook again in our own lives, but we must be able to take what we learned to solve that book problem and apply it to new problems and circumstances within our lives.

Students may apply Social Studies skills and content knowledge by doing the following: Research the Americans with Disabilities Act and understand how it influences the design of a physical construction project; explain how people interact with their communities and how a naturespace could improve community cohesion; analyze street maps and satellite maps to determine an advantageous location for a community park -- and also what areas may be disadvantageous or inauspicious; learn who serves the community on city council or other influential boards and how they tend to make decisions and solve problems; conduct research to learn about the history and how the town came to be what it is today; or design an advertising campaign to recruit support for your proposal, etc.

Students may apply English Language Arts skills and content knowledge by doing the following: Use persuasive writing skills to influence people to take meaningful action in their community; conduct meaningful research about [possible grants]\_\_\_\_\_ that could support a community initiative; write a formal proposal to present your project design to city council members; or recognize bias in written and spoken language by major influencers in the community, etc.

Students may apply Science skills and content knowledge by doing the following: Research the health benefits of different plants and trees that could naturally improve your naturespace; explain the relationship between exposure to green space/nature and salivary cortisol levels in the brain, and how might this affect someone's stress levels; or recognize trends and patterns in health, happiness, and performance when people are given regular access to nature spaces, etc.

Students may apply Mathematics skills and content knowledge by doing the following: Computing population densities and examining trends in data; determine which shapes maximize a given area; use ratio and scale concepts to sketch a visual of your space and demonstrate where benches, trees, architecture, and monuments will be placed (create an architectural drawing) and determine the amount of material needed to cover a designated area leading to a calculation of at "x" price, how much will it cost to mulch the entire space; analyze prices for needed supplies at

three different suppliers and determine which supplier to buy from based on quality, quantity, and budgetary restrictions.

### **Accessibility and Completion**

Our project can be completed digitally, using links from WQED's website to access resources, assignment documents, multimedia, and more; **or** students can complete the project in its entirety using a pencil and paper, and the printable resources from the website. The project is designed for students to complete independently, but could be adapted by teachers if there are unique opportunities for collaboration.

The project is designed as a 10-day unit. Each day's assignment or objective will incorporate Math, Science, ELA, and Social Studies into the assigned activities. Teachers may assign this project for students to complete during extended school closures. Teachers can determine scoring methods and point values to individualize it for all kinds of classes.

### **Focus and Goal**

This project provides students with an opportunity to learn about diverse problems in their communities and how they can help create a solution to address them.

Students can create spaces in urban or rural areas as a way to improve individual and overall community health. However, the project design does not require students to address a physical problem. Students and teachers are welcome to make adaptations and accommodations to make the project unique and meaningful to each student's individual community.

A student may analyze her community and recognize that there is a severe littering problem, or an intersection that is potentially dangerous, or an obesity problem that could be combated with better opportunities for physical fitness, or an area that needs better nighttime lighting to improve safety; or maybe the community just has an antisocial vibe and an outgoing student can design a solution and write a proposal to create collaborative experiences for neighbors to get to know each other. That would be perfect -- and would still require Social Studies, Math, Science, and ELA skills to do it well.

No matter what, students should identify a problem and then frame it as an opportunity. Then, begin the work in designing a comprehensive solution. Our hope is that students will apply their skills, chase their passions, and create meaningful change for the places they call home.