NAME: _____ Teacher _____ Period _____

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

NOTE TO PARENTS AND STUDENTS:

- *The schedule and content is designed by classroom teachers as a guide.*
- *Your student can pace himself or herself through this project for the next 10 days to practice Math, Science, ELA, and Social Studies content and skills.*
- *Please understand that you may adapt and/or modify any and all assignments as needed.*

Table of Contents

(Place a check mark on the line after completing each day's assignments.)

WQED education

Bookmarks for quick maneuvering during our work time.

Project Overview

Purpose

Because we recognize that problems are not confined to any classroom or community, time period, or group of people, 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.

Summary

Students will begin this project by analyzing their own community with a critical lens. Identifying a problem or weakness within the community 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, we have chosen one possible focus that students may consider: designing 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 people's 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.

Focus and Goal

Students should identify a problem in their community, and then frame it as an opportunity for improvement. 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.

"The Benefits of Urban Green Space"

When scouting for new homes, recent research suggests city-dwelling families may do well to consider an area's surrounding green space. A study of 600 children, published in the journal *Plos Medicine,* finds that kids who grow up in urban areas with access to green space have higher IQ compared with kids who lack access to parks, gardens, and trees. The IQ bump was especially pronounced for kids "at the lower end of the spectrum, where small increases could make a big difference," *The Guardian* reports.

The green space also seemed to reduce behavioral problems and aggressiveness in kids. The researchers think a few factors are at play, including lower noise levels, reduced stress due to exposure to nature, and more physical activity. "I think city builders or urban planners should prioritize investment in green spaces because it is really of value to create an optimal environment for children to develop their full potential," said Tim Nawrot, a professor of environmental epidemiology at Hasselt University in Belgium. [*Plos Medicine, The Guardian*]

Assignment #1

"What Can GREEN Do For You?"

Day 1: Introduction

Objective: You will learn about the process of identifying a problem and creating possible solutions, such as creating green spaces in urban or rural areas as a way to improve individual and overall community health.

Rationale: We will help you to explore the value of taking action for change in your local community, starting with visualization, what this project could look like for you.

Goal: Understand the word "community" and what it means to different people.

Introduction: Think about, and visualize, your own community. Picture the good with the bad. Then think about how you could contribute to positive changes in your community.

For any project in life, we must progress through stages from start to finish. Here, you will study the 5 stages of the writing process as described by Purdue's Online Writing Lab. We will refer to, and apply, each of these stages as we progress through our problem-solution project throughout this unit.

Key Terms: Infrastructure, community, green space, cortisol

Materials & Resources: Paper, pencil
ELA: Stages of the Writing Process

ACTIVITIES:

Social Studies

- **Create** an idea-web. Write the word "Community" in the center. Create idea-stems about what community means to you.
- **Define** the words: **infrastructure*, community*, green space***
- **Respond** to the following questions underneath your idea web:
  - What are some of your community's strengths?
  - What are some of your community's weaknesses?
  - How do you think people in your community would interact with a green space/nature space?
  - How could it potentially improve community cohesion?

ELA

- **Take notes** while reading ELA Resource 1 "Stages of the Writing Process"
  - List the 5 stages of the writing process, and
  - Write 1-2 sentences that best capture the most essential information for each stage (*such as a definition or the key "how-to" for that stage.*)

MATH

- **Create** a list of 3-5 ways math can be used in each of the following settings: **grocery store, kitchen,**

traveling, personal finance, time management, building a park.

- **Describe** how you think math can be used to elicit, or generate, change in your community. Provide at least one example.

SCIENCE

- *Cortisol is made by your adrenal glands - two small glands that sit on top of your kidneys. It is an essential hormone that helps you deal with stress. Cortisol also helps to limit any functions that aren't essential in a fight-or-flight situation. Once the threat passes, your hormones return to their usual levels. This whole process can be a lifesaver.*
  But when you're under constant stress, this response doesn't always turn off. Long-term exposure to cortisol and other stress hormones can wreak havoc on almost all of your body's processes, increasing your risk of many health issues, from heart disease and obesity to anxiety and depression.
- **Make a prediction** to explain the relationship between exposure to *green space/nature* and cortisol levels in the brain. How might this affect someone's stress levels?

Assignment #2

"Expose our Roots to Investigate the Problem"

Day 2: Make sense of problems and persevere in solving them.

Objective: You will explain the meaning of a problem and look for entry points to its solution, analyzing the givens, constraints, relationships, and goals.

Rationale: You will need to investigate the history behind the identified problem in order to better understand why it exists in its current state. This will help you to create an efficient and effective solution.

Goal: Analyze a specific community "problem" and understand the history behind it.

Key Terms: blight

Materials & Resources:

Social Studies: Solving blight: Local leaders working together, but numbers are growing (*WJAC-TV*)
ELA: Stage 1 of the Writing Process; Example Graphic Organizer
Math: List of States By Population Density
Science: How Nature Can Make You Kinder, Happier, and More… (*Greater Good Science Center*)

ACTIVITIES:

Social Studies

- **Read** the article: *Solving Blight: Local Leaders Working Together, but Numbers are Growing*
- **Define** the word **blight*.**
- **Explain** possible reasons why blight may exist in a community.
- **Identify** which of the counties listed in the article has the most abandoned properties. How many?
- **Analyze** a problem that exists in your own community. Investigate and summarize the history behind the problem. (If you can't conduct research, create a hypothesis.)
- **Explain** a possible solution to the problem.

ELA

- **Brainstorm** perceived problems in your community and ways to potentially make it better.
- Consider using a graphic organizer such as a word web or a flow chart (See Example Graphic Organizer).

Math

- **Describe,** in your own words, what you think the term "population density" means.
- **Respond** What do you think the population of the United States is today?
  - What do you think are the top 5 *most-populated* states?
  - What do you think are the 3 *least-populated* states?

number of people ÷ the area they occupy = population density

- **Identify** the formula for, and **calculate,** the population density of your community using population and area at different times in the past.

- If you cannot access the square mileage of your own community, use the following numbers to solve the equation:
- Johnstown, PA - Area = 6 square miles
  Population = 19,195
  So what is the population density?

- **Practice** calculating population density of surrounding communities or states. (Search to find the appropriate variables and then solve the equation.) Do your findings match your assumptions?

Science

- **Explain** how being in nature makes you feel *physically*. **Explain** how it makes you feel *mentally*.
- **Make predictions** Why do you think nature tends to have a calming effect on our minds and bodies?
- **Read** the article: **How Nature Can Make You Kinder, Happier, and More…**
- **Summarize** each of the 5 main sections of the article in 1-3 sentences (for each section).
  1) *Being in nature decreases stress*
  2) *Nature makes you happier and less brooding*
  3) *Nature relieves attention fatigue and increases creativity*
  4) *Nature may help you to be kind and generous*
  5) *Nature makes you "feel more alive"*

Assignment #3

"Color Outside the Lines; Think Outside the Box"

Day 3: Reason abstractly and quantitatively.

Objective: You will make connections to better understand the relationships between problem scenarios and mathematical representation (maps, plans, itineraries, etc.), and strategies for solution.

Rationale: Albert Einstein, one of the most widely recognized critical thinkers, once said if he were given an hour to solve a problem, he'd likely spend 5 minutes on the solution and the other 55 minutes defining and researching the problem. Like Einstein, you, too, should analyze the problem from all angles while making connections before proposing a solution.

Goal: Analyze the values that define your own town and make connections to how those values are represented in the community.

Key Terms: values, densification, biophilic, credibility

Materials & Resources:

Social Studies: Overpass park designed to celebrate Hill District history (*Pittsburgh Post-Gazette)*

ELA: Stage 2 of the Writing Process; Problem Solution Paragraphs; Persuasion Rubric; Persuasive Writing Words and Phrases

Math: Animated Map: Visualizing 200 Years of US Population Density

Science: Kids who grow up near green space have better mental health (*Quartz*)

ACTIVITIES:

Social Studies

- **Read** the article: *Overpass Park Designed to Celebrate Hill District History*
- **Explain** the relationship between the design of the "Overpass Park" and the history of that space in the Hill District.
- **Apply** concepts to your own city or town.
  - List 3-5 historical highlights of your town.
  - Write 3 **values*** that you think appropriately represent your town.
  - How would you design a space to appropriately reflect the history and values of *your* community? What people, places, or events would you highlight *in your community*?

ELA

- **Draft** a developed, one-paragraph persuasive argument to express your community needs.
  - Thoroughly explain the problem(s) and your proposed solution(s).
  - Use descriptive language to explain the problem(s) and your proposed solution(s).
  - Include # facts and statistics from research to add **credibility*** to your position.

Math

- **Describe,** in your own words, what you think a scatterplot is.
- **Analyze** the interactive map: Animated Map: Visualizing 200 Years of US Population Density
- **Graph** a (rough) scatter plot of population density versus year.
- **Determine** whether the scatterplot has a positive, negative, or no correlation and **think** about what this means in the context of the problem.
- [Learning Extension]
  If you can access the animated map (follow the link above), watch the population change over time. Choose a decade that demonstrated notable population growth in some part of the country. Make a connection to the events of that time to explain the visible change on the graph. Or ask a question about a specific change you noticed in the interactive map.

  Example: *The map is* populating from east to west up until the 1840s and 1850s when we start to see population boom in California but not in the central region of the country. What may have caused this disruption to the population growth trend?

Science

- **Read** the article: Kids who grow up near green space have better mental health
- **Define** **densification*** and **biophilic*** design.
- The article states, "Green spaces are 'potentially decreasing the risk of a lot of disorders, and can add up to a lot of potential benefits to a lot of people.'"
  - **Explain** why you think green spaces may potentially decrease the risk of disorders in children. What scientific evidence do you have to support your explanation?

Assignment #4

"The Only Person You Have to Convince is Me."

Day 4: Construct viable arguments and critique the reasoning of others

Objective: You will explain and discuss thinking processes including agreement and disagreement, providing multiple approaches to a problem and identify plausible rationales for each approach. (civil discourse, thought process, etc)

Rationale: An argument is strengthened by the depth and breadth of its defense. When you can demonstrate that you've considered the reasoning and proposals of others, and *still* argue that your solution is best, you will start to build formidable support.

Goal: Analyze a debate topic and examine the main points from multiple perspectives while considering the human emotions involved in the process. Analyze the design process and consider how different perspectives can satisfy design guidelines in different ways.

Key Terms: horticulture, counterargument, rebuttal, mock, relevant, city council, school board

Materials & Resources:

Social Studies: Article: Can Trees and Grass Become Best Crime-Fighting Tools?
ELA: Stage 3 of the Writing Process; Interview and Survey Questions; Preparing Rebuttals
Science: How the Brain Processes Emotions

ACTIVITIES:

Social Studies

- **Read** the article: Can Trees and Grass Become Best Crime-Fighting Tools?
- **Define** the word: **horticulture***
- **Summarize** the reasons people believe replacing run-down buildings and abandoned lots with green spaces can reduce crime and violence.
- **Explain** why some people may disagree.
- **Analyze** the quote from the article: "If you clean a space, people will want to protect it." Do you think this statement is accurate? Provide an example to support your argument.

ELA

- **Prepare** for **counterarguments*** to your proposal and possible **rebuttals***.
- **Practice** a **mock*** question-answer (Q/A) session within a **relevant*** scenario with an audience of at least one person who may oppose your proposal. *(Consider scenarios such as a **city council*** meeting or a **school board*** meeting.)*
    - One example focus could be on the budget proposals, for example. Hesitation to adopt proposals often deals with cost.

Math

- Your challenge is to **design** the ideal space for a community hoping to create social and collaborative experiences.
- Use the following guidelines:
    - At least two kids in the neighborhood use wheelchairs.
    - The kids enjoy sports, music, and food.
    - Your space must include an access route to transportation, a sitting area, some form of lighting, a space for plants/garden, and some kind of basic shelter (could be a roof or pavilion).
- How do these guidelines influence your design decisions?
- What MATH will you need to use in designing this space?
- What formulas will you use in the process? (Write out the formulas. Provide an example of how you could use a formula to solve a problem.)

Science

- **Read** the article: How the Brain Processes Emotions
- The process of discussion/debate can become very emotional when one is passionate about the subject. Emotion can mean many things; it refers to positive or negative feelings that are produced by a specific situation.
- **Identify** negative emotions and/or positive emotions that can be triggered during the process of debate.
    - What parts of the brain control emotional responses?
    - What behaviors could be displayed by an individual experiencing these positive and/or negative emotions?
    - How can we learn to control our negative emotions? What works for you? Explain *why* you think this method is successful.

Assignment #5

"If There's a Problem, Math Will Solve It!"

Day 5: Model with Mathematics

Objective: You will move explicitly between real-world scenarios and representations of those scenarios, assessing how this is like what happened at another time or place and what was done before. Did it work?

Rationale: You do not need to "reinvent the wheel" when solving problems. Chances are, similar problems have been solved and we can learn from what was done and how it worked (or didn't work). Using models and representations reduces risk while still providing authentic opportunities for trial and error.

Goal: Analyze maps and graphs, as models, to determine factors that may lead to environmental discrimination.

Key Terms: Environmental justice, environmental discrimination, pollution, urban planning

Materials & Resources:

Social Studies

1.) Connecticut Air Pollution Map vs. Minority Density (Teaching Tolerance, www.tolerance.org)
2.) Biases in Exposure to Pollution in Massachusetts (Teaching Tolerance, www.tolerance.org)
3.) Pollution Map for Allegheny County, PA (*Breathe Project,* www.breatheproject.org*)*
4.) **Environmental injustice in Pittsburgh (*Environmental Health News,* www.ehn.org)

** Supplementary article. Not required reading.

ELA: Quoting, Paraphrasing, Summarizing; Directly Quoting; Effective Paraphrasing
Math: Heron's Formula, 3 Simple Ways to Find the Area of a Pentagon
Science: Kids growing up in green areas have better mental health as adults

ACTIVITIES:

Social Studies

- **Analyze the maps,** *Air Pollution in Minority Areas, Pollution Map for Allegheny County*
- **Analyze the graphs,** *Biases in Exposure to Pollution in Massachusetts*
- **Define** the terms: **environmental justice*, environmental discrimination*, pollution***
- **Summarize** why poor and minority areas are often exposed to more pollution than others.
- **Make connections:**
  1.) Explain how pollution is related to inequality.
  2.) How can maps and graphs help us see where injustice exists?

ELA

- **Identify** key ideas while reading secondary sources (from fields of social studies, science, math, or other). Select the most relevant information to potentially cite in your revised proposal to help strengthen your argument.

- **Summarize, paraphrase, or directly quote** the information when you incorporate it into your revised proposal.

Math

- How does the area of a *quadrilateral* compare to a *triangle* with the same perimeter? How about a *pentagon*?
    - Cut 3 strips of cardboard, all at the same length. (3 strips of 12″ cardboard)
    - Bend one strip into a **triangle**, with sides of lengths 3″, 4″, and 5″.

Formula for area of a **triangle:**

Your answer:

- Bend one strip into a **square,** with sides of 3″.

Formula for area of a **square:**

Your answer:

- Bend one strip into a **pentagon,** with sides (roughly) 2.4″.

Formula for area of a **pentagon:**

Your answer:

- **Complete** an investigation to determine the best shapes to maximize space in your community.
- **Update** your thoughts on how you think math can be used to elicit change in your community.

Science

- **Read** the article: Kids growing up in green areas have better mental health as adults.
- **Analyze** the multiple benefits of vegetation within an urban space, as stated in the article.
- Then, **paraphrase** the article for more clarity, using 1-2 paragraphs.
    - What are the most important takeaways?
    - What questions do you still have?

Assignment #6

"Let's Get REAL With Our Learning"

Day 6: Use appropriate tools strategically

Objective: You will use tools to aid the problem-solving process and predict what actions are necessary for the task to be accomplished. Assess what could have made the task easier or more difficult.

Rationale: Meaningful learning should be generalizable and applicable to real life. You will learn to use tools (formulas, strategies, techniques, etc.) to be dynamic in solving problems.

Goal: Make learning real and meaningful by applying learned knowledge to solve new problems.

Key Terms: appositive, *Americans with Disabilities Act (1990)*

Materials & Resources:

Social Studies: ADA Accessibility Standards Now Include Parks (Pittsburgh Parks Conservancy)
ELA: Effective Interviewing; Creating Good Questions; Appositive Phrases; Example Quotes

ACTIVITIES:

Social Studies

- **Read** the article: ADA Accessibility Standards Now Include Parks
- **Summarize** the **Americans with Disabilities Act***. Why is it important? How does it drive the design process to accommodate everyone in different spaces?
- **Analyze** the quote from the article: *"While it seems obvious that a goal in the design of a new playground is to allow a disabled child to play easily with other children, less obvious is the fact that a disabled parent also would need to be able to reach her child (disabled or not) in case she falls or gets hurt."*
    - How would your green space design accommodate disabled people?
- **Write** one thought you had while reading the article about the ADA applied to parks.
- **Write** one question you have. What still makes you curious? What might you need to have clarified?

ELA

- **Interview** 1-2 people to add more voice and perspective to help enhance your argument (ideally from
  other age groups, gender, role, etc.)
- **Apply** an appositive phrase to identify each interviewee in your text.

Math

- **Describe,** in your own words, what you think *unit price* is.
- **Apply** Use linear regression for proportion concepts to determine unit price of an item when increasing scale and scope of an order.

1 yard = $29 **5 yards = $130**

  - **How much would 80 yards of mulch cost?**
  - **With a mulch budget of $1,650, how many yards of mulch can you get?**

- **Design** your own math problem using linear regression to determine unit price at different increments. Use a table to show the unit prices at different increments.

Science

- **Connect** Reach out to a medical professional (a nurse, nurse practitioner, physician's assistant, doctor) to ask them about additional health benefits of Green Spaces in the community. ("How do you think people in our community would benefit from more nature space? Are you familiar with any health benefits associated with time spent in nature?" And so on…) Make sure you ask for their permission to use the information you are collecting. This will also enhance your argument.
- **Reflect** After speaking with a medical professional (or reading their research), explain how your new learning will influence the design of your own community green space.
- Remember, you can reach out to your own doctor as a resource. If you are unable to have a conversation with a healthcare professional, please write down facts about each of the areas listed below:
  a. How do green spaces improve *mental* health?
  b. How do green spaces improve *emotional* health?
  c. How do green spaces improve *physical* health?

Assignment #7

"Timing Beats Speed. Precision Beats Power."

Day 7: Attend to precision

Objective: You will use clarity and accuracy of process and outcome in problem solving. Summarize what materials and resources are needed to implement the plan with accuracy and clarity.

Rationale: A formal proposal for meaningful change must be edited, revised, polished, and precise. Minor errors can be disqualifiers when submitting work to policy makers and decision makers.

Goal: Move your project proposal from a rough draft to a presentable copy through the revision process. Learn to think critically and analyze primary sources to ensure authentic clarity and accuracy of process.

Key Terms: cite, veracity

Materials & Resources:

Social Studies: CHIEF SEATTLE'S LETTER
ELA: Stage 4 of the Writing Process; In-Text Citations;
Science: The 8 Dimensions of Wellness: Where Do You Fit In?
** 8 Dimensions of Wellness (Supplementary resource. Not required reading.)

ACTIVITIES:

Social Studies

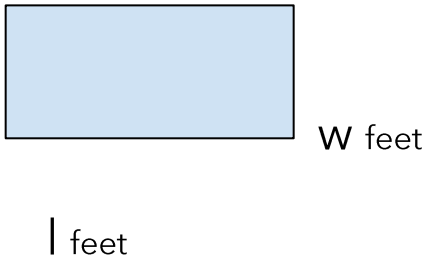
- **Read** CHIEF SEATTLE'S LETTER.
- Prepare to **think critically**, like historians, by learning to analyze and critique primary sources:
  (1) ***Assess the point of view of an author and source***. - Who is the author of this letter? What is his purpose for writing it? When was it written?
  (2) ***Place arguments in context*** - When was this speech delivered? What do you know about this time period in our country? Attend to accuracy.
  (3) ***Validate the veracity* of a claim*** **-** How accurate do you think Chief Seattle's message is, overall? Is there truth to what he's claiming?
- **Apply** How can reading primary sources help us to inform a more accurate understanding of a problem? Inversely, how can reading secondary sources be inaccurate?

ELA

- **Edit/Revise** your original proposal to include expanded information and understanding that you've gathered since stage 1 of your process.
- **Cite*** your sources in-text appropriately, adding credibility to your content and context.

Math

- The length, l, and the width, w, of the rectangle shown below have values that are rational numbers.



- **Construct** an informal proof that shows that the value of the area, in square feet, of the rectangle must be a rational number.
- **Calculate** accurately and efficiently. **Explain** your thinking using mathematics vocabulary. **Use** appropriate symbols and specify units of measure.

Science

When thinking about Green Spaces, let's make sure that we are thinking of all the ways that green spaces will promote wellness. Wellness is identified by eight dimensions that focus on optimal health.

The eight dimensions are emotional, spiritual, financial, intellectual, physical, environmental, occupational, and social. Think of ways that Green Spaces can satisfy each area of wellness. (ie: Emotional wellness can be improved by changing what you do in your leisure time. For example, just visiting green spaces to sit and look at nature gets your senses involved and promotes relaxation which can evolve into clarity.)

- **Create** an example of wellness within each of the 8 dimensions.
- **Apply** Choose two of these dimensions to specifically include in your green space design.
- **Explain** how your green space will promote wellness within these dimensions.

MATH ANSWER KEY

Given: l is rational; w is rational.
Prove: l × w is rational.

Proof: Since l is rational, by the definition of rational number, l can be written in the form , ___, where a and b are both integers and b is nonzero. Similarly, since w is rational, by the definition of rational number,

w can be written in the form , ___c where c and d are both integers and d is nonzero.

Then l x w = ___x ___c = ___a .

Since the set of integers is closed under the operation of multiplication, both ac and bd are integers. Thus l × w is the ratio of two integers. So by the definition of rational number, l × w is rational.

Assignment #8

"Where Have I Seen THIS Before?"

Day 8: Look for and make use of structure

Objective: You will look closely for patterns or structure in order to solve a problem; apply concepts to similar events while recognizing what is similar and what is different this time.

Rationale: When a new problem arises, chances are good that there has been a precedent set previously to teach us about how things worked out the last time something similar happened.

Goal: Learn about the "before" and "after" of problems in your community. How did they originate? What has been done to address them?

In order to better understand how problems were solved and how precedents were set during the creation of our nation's government, students will read an excerpt from the Federalist Papers to learn about how Founding Fathers created solutions to problems.

Key Terms: dopamine, oxytocin, serotonin, endorphins, neurotransmitters

Materials & Resources:

Social Studies: Federalist, No. 78 (Included on Resources page - "Social Studies Day 8")
ELA: Creating Headlines for an Article
Science: Neurotransmitters Types of neurotransmitters (video)
4 Ways to Hack Your Brain Chemicals to Become More Productive

ACTIVITIES:

Social Studies

- **Read** excerpt from Federalist Papers' No. 78 examining the judicial branch of the proposed government.
    - Primary source excerpt from Federalist Papers' No. 78 -- (Lexile level 1190)
    - Text included on "Resources" page.
- **Respond** to the following questions:
    1) Why does Alexander Hamilton consider the judicial branch to be the least dangerous to the political rights of the Constitution?
    2) What is the proposed solution when it occurs that, "There are two laws existing at one time, clashing in whole or in part with each other."?
        a) Explain the structure of this proposed solution.
        b) Provide an example of how the "Supremacy Clause" may apply today.

ELA

- **Draft** a headline relevant to your scenario (for a newspaper article, personal blog, or yearbook page, for example) that highlights the compare and contrast of your problem-solution work (the "before" and "after").

Math

- **Prove** Use coordinates to prove simple geometric theorems algebraically.
    - Alicia and Avery are best friends. They placed a map of their town on a coordinate grid and found the point at which each of their houses lies. If Alicia's house lies at (9, 7) and Avery's house is at (15, 9) and they wanted to meet in the middle, what are the coordinates of the place they should meet?
- **Apply** How can you use an equation like this to solve a problem in the design of your green space?
    - In what ways does this problem connect to other mathematical concepts?
    - Can you generalize the results from this problem/situation?

Science

- **Read** the article about "happiness" brain chemicals and how to hack them.
- **Explain** how green spaces help us to trigger these neurotransmitters.
    - Write down 2 ways the utilization of green spaces helps to trigger each one of these neurotransmitters (dopamine, serotonin, oxytocin, endorphins).

Assignment #9

"I Like What You're Thinking. Now Let's Improve It."

Day 9: Look for and express regularity in repeated reasoning

Objective: You will maintain oversight of the process while attending to details.

Rationale: A healthy and thorough understanding of a problem allows us to keep an eye on the big picture while working out the details of the problem.

Goal: After revising and editing the details of your problem and solution, we want to re-examine the larger picture to assess our progress toward our original goal.

Key Terms: pandemic, social justice

Materials & Resources:

Social Studies: In a Pandemic, the Parks Are Keeping Us Alive
ELA: "A Narrow Fellow in the Grass"; "I Wandered Lonely as a Cloud"
Science: Community Assistance (This information would be based on where the student lives.)

ACTIVITIES:

Social Studies

- **Examine** health equity as a social justice issue -- "Environmental Justice"
- **Read** In a Pandemic, the Parks Are Keeping Us Alive
- **Define pandemic*** and **social justice***
- **Summarize** In 1-2 sentences (each) summarize each section from the article: **Accessibility, Funding, Space.**
- **Make connections**
    - Now that we've looked at the details of the problem, let's recall the bigger picture of the problem. **Explain** how access to green spaces (or lack thereof) has become a social justice issue. How would you make your community green space more accessible to all people?

ELA

- **Analyze** how writers use poetry to express emotion about nature and their surroundings:
    - Emily Dickinson poem "A Narrow Fellow in the Grass" (an unnamed object in nature)
        - **Identify** Dickinson's unnamed object in nature.
        - **Imitate** her rhyme pattern for an object in nature of your own choosing **and/or**
    - William Wordsworth's *I Wandered Lonely as a Cloud* (stanza 1)
        - **Replace** lines (3-6) (what Wordsworth describes using imagery) with your own choice descriptive imagery of a scene in nature. (Perhaps consider describing something from your community solution.
        - **Create** mood by choosing vivid words that reflect an emotion, such as joy, peace, or appreciation.

MATH

- *Inversely proportional quantities change in inverse ways. This means that if one of the quantities doubles, then the other will become half as large.*
- **Determine** how long it will take the construction crew to set up a playground, 4 park benches, and a bike rack at the park.
    - With a work crew of 3 people, it will take 16 hours to assemble the playground, 3.5 hours to assemble and install the park benches, and 2 hours to assemble the bike rack.
    - If working at the same rate, how long would it take for 7 people to complete these 3 tasks?
    - If each worker is making $9.25/hour, is it more cost effective to pay 3 workers for 16 hours or 7 workers for the amount of time it will take them to complete the same tasks?
    - Which work crew would you choose (3 people or 7 people) and how much money would you save by making the right decision?

Science

- **List** county and community resources**,** then reach out to let them know of your project. These services may be able to provide you with additional resources and may also want to provide their services. **Resources like: Cambria County Dept. of Human Services, Cambria County Behavioral Health, and Community Action Partnership.**

  Sample Telephone Conversation:
  Hello, my name is _____, and I am a student at __(school)___. I am taking part in a project that involves creating a green space within our community. We are in the final steps of the process, in regards to approval. I am reaching out to you for support of the green space we will be building, via your usage of the space. Also, my fellow students and I would love to see someone from your company present when we present the new space to the community. Do we have your support?

  (If yes, get a contact name and phone number and let them know you will be in touch when you receive a final decision from the city, and you will keep them updated along the way. If no, thank them for their time, provide a closing salutation.)

  Tips:
    - You do not need to tell what school you are with if you are not comfortable.
    - Contact 3-5 community resources.
    - You do not have to convince anyone to be a part of your celebration
    - Make sure you get a good contact person and phone number for future reference.

Assignment #10

"Hey Neighbors, Let's Do This."

Day 10: Finalize your project

Objective: You will present work to an authentic audience (newspaper readers, city council, community members, etc.)

Rationale: Establishing an authentic audience for your work allows you to see the real-world purpose for their work. You should synthesize all their research, supporting evidence, and final proposal

Goal: Present student work to an authentic audience so students can recognize the real value of their work and how it connects to the community. The authentic audience will benefit by recognizing the school's role in guiding the community as well.

Key Terms: authentic audience

Materials & Resources:

Social Studies ****Create worksheet guide to writing this letter (tips, structure guide, etc.)**
ELA: Stage 5 of the Writing Process; Public Speaking and Presentations
Math: Transformations
Science: Poster board, markers, pencil, etc

ACTIVITIES:

Social Studies

Presenting student work to an ***authentic audience**** *creates a meaningful real-life experience for students. They recognize the value of their work and how it fits into the real work being done in our communities.*

- **Write** a letter to your state or local legislator, or school board, etc to urge them to take action on your proposal. Provide facts to support your idea. Find two quality news articles that address various sides to the issue/problem and possible solutions. Use persuasive debate strategies including strong counter arguments. Use the following questions and guidelines to thoroughly draft your letter:
    - What is the problem, issue, or policy you are working on?
    - Summarize your proposed solution.
    - What problems did you encounter? Explain.
    - What are you proud of, as it pertains to your project?
    - What is the purpose of your action? What do you hope to achieve? Why?
    - Attach any evidence of your own action. (Copies of emails, correspondence, phone log, pictures of you at meetings or events, etc.)
    - What did you learn about your particular issue?
    - What impact did you make? (This could be large or small.)

- Do you feel like you have "succeeded" in your mission? Why or why not? Do you think you'll continue working on this issue after the project?
- What recommendation would you make to the next person who chooses to work on this issue?

ELA

- **Prepare** a 2 minute speech that would be appropriate for a news broadcast serving to interview you, showcasing your work leading this project in your community.

Math

Imagine you are the project manager for this green space in your community. When the student group presents their final design, you realize they placed a park bench and a sandbox in the wrong spot of the green space.

- Use a transformation graph to demonstrate **rotation, reflection, and translation** of these two shapes.
- **Draw** the two shapes on a plot that demonstrates your green space. (Use two different shapes. The bench is a rectangle and the sandbox is a triangle.)
- **Explain** how you used a transformation graph to precisely move two objects within your green space.
- **Prove** How else could you use graphs in your green space design project?

Science

- **Design** a poster that clearly demonstrates the health benefits of your project; in this case, the green space / park. Your poster should have an attention-grabber, an illustration, 3-5 research-based health benefits of the project, etc.
- On a separate sheet of paper, **describe** some of the emotions that you went through while completing this project about Green Spaces and why you felt that way. (ie: happiness, worry, doubt, delightment, frustration.)
- **Make connections** between the Scientific Method and your project. The Scientific Method requires us to (1) Ask a question, (2) Do background research, (3) Construct a hypothesis, (4) Test your hypothesis by doing an experiment, (5) Analyze your data and draw a conclusion, (6) Communicate your results.
    - **Evaluate** how your project may have followed the guidance of the scientific method. Provide examples where applicable.

KEY TERMS

ADA - *Americans with Disabilities Act (1990)* - a civil rights law that prohibits discrimination against individuals with disabilities in all areas of public life, including jobs, schools, transportation, and public and private places that are open to the general public

Appositive - a noun or noun phrase that renames another noun right beside it. (The insect, *a cockroach*, is crawling across the floor.)

Authentic audience - a person or group of people outside the teacher and classroom who receives or evaluates work in hopes of making the learning real and relevant.

Biophilic - a desire or tendency to be commune with nature

Blight - vacant, abandoned structures, typically homes and buildings

Cite - to credit the source or speaker when quoting, summarizing, or paraphrasing information referenced as evidence for or justification of an argument or statement.

City Council - the legislative body of people who are elected by community members to govern a city, town, municipality, or local government area.

Community - a group of people living in the same place or having a particular characteristic in common

Correlation - a mutual relationship or connection between two or more things.

Cortisol- an organic compound belonging to the steroid family that is the principal hormone secreted by the adrenal glands.

Counterargument- a set of reasons put forth to oppose (go against) another idea or argument

Credibility- the quality of being trusted or believed in

Densification - an increase in the number of people in a space

Dissenting Opinion - an opinion filed by someone who disagrees with the majority opinion

Dopamine - a neurotransmitter made in the brain that is released when your brain is expecting a reward; associated with pleasure or satisfaction

Endorphins - a group of hormones produced by the central nervous system and the pituitary gland to reduce pain and boost pleasure, resulting in a feeling of well-being. (Structurally similar to morphine.)

Environmental discrimination - unjust or prejudicial treatment, exposure, or opportunities to enjoy the benefits of nature due to grounds of race, income, or socioeconomic status

Environmental justice - the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies

Green Space / Nature Space - an area of grass, trees, or other vegetation set apart for recreational or aesthetic purposes in an otherwise urban environment.

Horticulture - the art or practice of garden cultivation or management

Infrastructure - the basic organizational structures of society, such as buildings, roads, and power supplies.

Inversely Proportional - the relationship between two variables when their product is equal to a constant value. When the value of one variable increases, the other decreases, so their product is unchanged.

Majority Opinion - an opinion agreed upon by more than half of the members involved in the argument

Mock - not real, simulated

Neurotransmitter- also called chemical transmitter or chemical messenger, any group of chemical agents released by neurons (nerve cells) to stimulate neighboring neurons or muscles or gland cells, thus allowing impulses to be passed from one cell to the next throughout the nervous system.

Oxytocin - a hormone produced in the hypothalamus and released by the pituitary gland that acts as a chemical messenger in the brain, controlling key aspects of the reproductive system, including childbirth and lactation

Pandemic - occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people.

Pollution - something introduced into the environment that is dirty, unclean, or has a harmful effect

Population Density - the number of people living in each unit of area

Precedent - an earlier action or event that is regarded as an example or guide

Rebuttal - a response to try to suggest or prove that a point is weak or incorrect; to refute

Relevant - closely connected or relevant to what is being done, said, or considered

Serotonin - a naturally occurring chemical nerve cells produce, which regulates mood, memory, happiness, and anxiety. Low levels of serotonin are linked to depression.

Scatter Plot - a graph in which the values of two variables are plotted along two axes, the pattern of the resulting points revealing any correlation present.

School Board - a group of people elected by the community members to determine the educational policy for a school district within a city

Social justice - justice in terms of distribution of wealth, opportunities, and privileges within a society

Sustainability - avoidance of the depletion of natural resources in order to maintain an ecological balance.

Unanimous Decision - all voting members are in agreement on an opinion

Unit Price - the cost per unit of an item

Urban Planning- design and regulation of the uses of space that focus on the physical form, economic functions, and social impacts of the urban environment and on the location of different activities within it.

Values - the regard that something is held to deserve; the importance, worth, or usefulness of something

Veracity - conformity to facts; accuracy; truthfulness