***WABS STEM PBL Unit/Lesson Plan Template***

**Description:**

Problem-based learning (PBL) is focused, experimental learning organized around the investigation and resolution of messy and real world problems. The Final Unit will allow you to organize your lesson in a problem solving environment where students engage in learning in relevant and connected ways. Teachers function as a coach to guide student inquiry and facilitate learning to deeper levels of understanding for your students.

Research indicates that PBL is a superior pedagogy for promoting student engagement in the learning process. Torp and Sage (2002)1 broaden the impact of this pedagogy and confirm that it increases motivation, makes learning relevant to the real-world, promotes higher order thinking and self-regulated learning in students.

Generally, the teacher will present the problematic situation. The problem is ill-structured and messy (multiple sub-problems), not easily solved and **does not result in one right answer**. Students engage in active problem solving, and teachers guide and coach. A collaborative environment provides for the sharing of information within and between groups as they work to resolve - some may test and re-resolve - their problems. Authentic assessment compliments the problem solving process.

1 Torp, L., & Sage, S. (2002) Problems as Possibilities: Problem Based Learning for k16 Education (2nd ed.). Alexandria, VA: Association for Supervision and Curriculum Development

**PBL Procedure[[1]](#footnote-0): What is in a PBL Unit?**

Use this page as a reference. The PBL procedure may be one lesson or may be the process throughout the whole unit. Lessons may focus on a small part of the procedure or highlight the iterative process needed to get closer to a solution**.**

**Understand The Problem*:*** Describe how you will launch your problem. In this portion of the lesson, students will work towards a common understanding of what the problem is and what they need to know in order to solve the problem.

* Introduction/Problem Launch
* Brainstorm What Students Know/Need to Know
* Define/refine the Problem

**Explore the Problem*:*** How will students’ explore multiple ideas, pathways, and challenge their current conceptions? How will all students access the information/context? The students (groups) will develop multiple solutions to the problem based on their evidence that will be shared in the next section.

* Gather Information
* Share Information
* Generate Possible Solutions

**Resolve the Problem*:*** Students should be able to provide an argument for each of the possible solutions and be given an opportunity to share and critique arguments. How will students reflect upon and share what they’ve learned? How will students synthesize their learning? If there are presentations involved with this PBL, how do you plan to help the non-presenters learn from presentations?

* Determine Best Fit solution
* Present the Solution
* Debrief the Problem

**Unit Overview**

**Public Health and Patterns of a Pandemic**

Target Grade Level(s): 6th-8th Grade

Subject(s): Math/Geometry, Science

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**Problem Statement:**

You have been feeling pretty awful for the last two weeks and can’t seem to shake whatever bug you’ve got. You decide to head into the local Kaiser Permanente clinic to get checked out. The waiting room seems more full than you would expect, and you have been told that it will be a longer than usual wait time. As you settle in, you look around and notice the room is bursting at the seams with people complaining of various symptoms. You are wondering what is going on with the community. Why are so many people sick right now? Who is responsible for the care of all of these people? You wonder if you all have the same illness, and start wondering about what you should be doing to keep yourself and your family healthy.

**Unit Overview and Table of Contents**

|  |  |  |
| --- | --- | --- |
| Lesson | Overview | |
| Clinical Interview Ideas | How do you identify an epidemic?  What is an epidemic?  What are things that can spread?  How do you stop something from spreading?  What is the difference between contagious diseases and infectious diseases?  Who is responsible for public health and safety? | |
| Lesson 1: Deadliest Pandemic Discussion  1.5 Days | Students are introduced to historical pandemics and discuss initial responses to healthcare related questions. | |
| Lesson 2: What is contagious? What causes the spread of germs?  1 day | Students discuss the definition of contagious, watch a video about “the 5-minute rule”, and then analyze data that goes along with it. | |
| Lesson 3: 1918 Flu Simulation  2 days | Students use a simulation activity to mathematically model the spread of a disease. | |
| Lesson 4: Analyze Data from Local Clinics  1 day | Students compare the definitions of contagious, infectious, communicable, and noncommunicable.  Look at the data from local KP clinics. Discuss trends in data from the clinic. | |
| Lesson 5: Clinic Data Discovery  3 days | Students are exposed to career pathways related to outbreak responses. Students are asked to investigate data, draw conclusions and communicate their findings related to industry healthcare partnership. | |
| Lesson 6: Collecting Information About an Illness: Typhoid  1 day | Students create data table for future research.  Students read and discuss an article about typhoid. Complete accompanying worksheet. Record information in the data table. | |
| Lesson 7: Investigating a Variety of Illnesses  2 days | Students choose an illness to investigate from a list, or come up with one of their own.  Students research their illness and share their findings with the class. | |
| Lesson 8: Pandemic Town Hall  2 days | Students participate in a town hall to discuss possible strategies to promote healthy practices or prevent further outbreaks. | |
| Lesson 9: Public Messaging  Enrichments/Extension  2 days | Students look at what types of public messaging are appropriate for different community groups. Students create posters to share their messages. | |

**Provide the following items for the entire unit:**

**Standards (NGSS, CCSS, CTE):**

**Health**

* Analyze how personal choices contribute to communicable and noncommunicable diseases.
* Assess personal health behaviors that help reduce or prevent health risks.
* Investigate valid and reliable local health information.
* Demonstrate communication skills to enhance health and to avoid or reduce health risks.

**NGSS Science and Engineering Practices:**

* Asking Questions
* Defining Problems (for engineering)
* Analyzing and Interpreting Data
* Using Mathematics and Computational Thinking
* Constructing Explanations
* Designing Solutions
* Engaging in Argument from Evidence
* Obtaining, Evaluating, and Communicating Information

**Mathematics**

* [CCSS.MATH.PRACTICE.MP4](http://www.corestandards.org/Math/Practice/MP4/) Model with mathematics.

**Soft Skills:**

Communication:

* Whole group and partner work to communicate thinking.
* Problem exploration and summary
* Demonstrate and present information

Collaboration:

* Partnership in lessons
* presenting the information
* Compromising and consensus in group work

Critical Thinking:

* Planning ahead and describing next steps
* Providing status report modeled after industry partners
* Application of scientific method - hypothesis, outline, what you are measuring, examining results, analyzing data

Creativity:

* Designing solutions to address the problem statement
* Role playing during culminating activity

**Locally and/or Personally Relevant for Students:**

This PBL provides the opportunity to explore several trending topics including: epidemics, vaccination, health care, and social media. Students will explore these topics through the lense of Kaiser Permanente (a local healthcare provider), and King County Public Health in order to see how local businesses and government solve problems related to health care.

**Connections to career and educational pathways:**

* Clinicians.
* Epidemiologists
* Microbiologist
* Social Scientist
* Infection Prevention and Control Specialists
* Water, Sanitation and Hygiene Specialists
* Logistics and Security
* Sanitation engineer
* Data Analyst
* Healthcare Providers
* Community Outreach
* Business Owner
* Banker
* Real Estate Agent
* Farmer
* Public Relations

**Lesson 1: Deadliest Pandemic Discussion**

**Problem statement:**

**Learning objectives:**

Students will engage in discussion and communicate thinking related to public health considerations during a pandemic..

Students will compare and consider various pandemics throughout history.

**Lesson standards (NGSS, CCSS, CTE):**

CCSS ELA.8.1.a: Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

**Soft skills:**

Communication

**Materials:**

Discussion prompts

**Lesson preparation:**

Are we prepared as a nation for the next big outbreak? Outbreak is a term that can be used to refer to a range of possibilities from a virus such as swine flu that kills a couple hundred thousand people to an infected shipment of food that left dozens of people sick. Today's discussion will look at the six deadliest outbreaks and pandemics in history and ask you to explore the impact that these outbreaks had as they essentially changed the course of history.

**Time required:** 60-90 min

**Grouping of students for instruction:**

Students work independently for initial responses

Students participate in a whole class discussion.

**What is the instruction? Consider the PBL Procedure that is being addressed here: Understanding**

**Understanding the Problem**

|  |  |
| --- | --- |
| **Teacher** | **Student** |
| Launch the lesson by presenting discussion prompts for students utilizing the class venue for discussions. Could be an online discussion board, class worksheet and written response, etc. | Reading through the 6 deadliest pandemics prompts and selecting from the set to focus on. |
| Supporting research and reflection space for students. | Recording and reporting their initial thoughts related to the discussion prompts. … |
| Facilitating a discussion venue for students to share their initial thoughts. Recording student thoughts to design groupings and gather initial data. | Sharing initial thoughts in the teacher directed discussion venue. |

**Accommodations:**

For students with visual impairment consider font size for the discussion prompts.

For students with SPED needs, select one or two of the choices rather than the full list of 6.

For students who are highly capable encourage them to research pandemics that are not part of the provided pandemics and write their own public health related discussion prompt.

**Extensions:** Extend the lesson by making a timeline and a graph of pandemics as well as the impact worldwide. Map and look for patterns in locations.

**Assessment:**

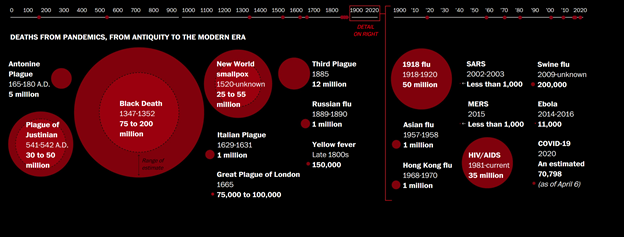
Student learning will be assessed upon participation in the discussion and communication. The final product will be a written response to the student selected prompt from the provided pandemics.

**References/Resources:**

<https://www.health.com/condition/infectious-diseases/worst-pandemics-in-history>

<https://www.mphonline.org/worst-pandemics-in-history/>

<https://www.washingtonpost.com/graphics/2020/local/retropolis/coronavirus-deadliest-pandemics/>

**Past Pandemics and Outbreaks Discussion Board Prompts**

**The Black Plague**

In the middle of the 14th century from 1347 to 1351, the Black Death reshaped European landscape and the world. As much as half of Europe may have died in a span of only four years. Global population estimates that when the plague began that 450 million people were alive, at least 75 million are believed to have been struck by the pandemic, however estimates span as high as 200 million.

The plague was so devastating that simply saying "The Plague" brings it to the forefront of historical memory. The name came from the black skin spots on the sailors who travelled the Silk Road and docked in a Sicilian port, bringing the disease now known as the bubonic plague with them from their voyage.

**​***What role do you think that the travel industry have in ensuring the safety of passengers? How does this affect international relationships? Should people be allowed to travel while ill? Would regulations be dependent on purpose of travel?*

**HIV/AIDS**

This pandemic remains a battle and medicine has made huge progress, making HIV in many ways a chronic condition that can be managed in many countries, an end is not near in sight. Originated in Cameroon and first recognized in 1981, the earliest documentation is believed to be in the Congo in 1959. Since the beginning of the epidemic 75 million people have been infected by AIDS and 32 million have died. Today the impact varies widely across the world, an estimated 1.1 million Americans, Sub-Saharan Africa has the majority of cases accounting for 61% of new HIV infections.

**​***What role does the healthcare industry play in educating the public about outbreaks?*

**The Antonine Plague**

Named for Roman Emperor Marcus Aurelius Antonius, the outbreak began in 165 and lasted until 180 where an estimated five million people died from what is now thought by scholars to have been smallpox. It's believed to have begun in Mesopotamian city of Seleucia (in modern-day Iraq) and spread to Rome by soldiers returning from the city's siege. At one point it is estimated that 2000 Romans died each day.

**​***What role does the healthcare industry play in providing care for illnesses not contracted in the region of care? How can we educate about public health and safety when the origin is not regional?*

**The Plague of Justinian**

In the year 541, rats on Egyptian grain boats bought a fatal disease to the Eastern Roman Empire that would leave approximately 25 million people dead. The Plague of Justinian tore through the empire. The emperor himself-Justinian I, for whom the plague was named-contracted the disease. While he lived, many didn't, with estimates that at one point as many as 5000 people died per day in Constantinople, the empire's capital. By the end about 40 percent of the city's population was dead **and so quickly that** disposal of bodies could not be kept up. Modern scholars and experts in the field believe this outbreak was the first recorded case of the bubonic plague.

**​***What role does the public health sector play in ensuring food safety and cleanliness of facilities? When facing epidemics, outbreaks or pandemics, how can the medical industry ensure proper care and adequate space for those facing illness?*

**1918 Spanish Flu**

While each year it appears there is another form of the flu virus that makes media attention, The Spanish Flu (although, not actually from Spain), had a quick and sudden decimation of the global population. The Spanish Flu had a mortality rate as high as one in five and an estimated one-third of the world population was afflicted, killing as many as 50 million people with approximately 25 million of those deaths in the first 25 weeks of the outbreak. The first US case came in March 1918, the disease spread especially quickly due to the close living quarters of troops fighting in World War I.

**​***How can the public provide care while protecting themselves? What role does the healthcare system have*

*to protecting spread of disease in situations where containment poses challenges?*

**Soft Skills:**

**Locally and/or Personally Relevant for Students:**

This PBL provides the opportunity to explore several trending topics including: epidemics, vaccination, health care, and social media. Students will explore these topics through the lense of Kaiser Permanente (a local healthcare provider), and King County Public Health in order to see how local businesses and government solve problems related to health care.

**Connections to career and educational pathways:**

* Clinicians: Develop and review treatment guidelines, plans and infection prevention and control measures.
* Epidemiologists: Use data to generate information about infectious diseases
* Microbiologist: Provide disease identification and molecular tracing of strains in an outbreak
* Social Scientist: Investigate social. political and economic factors that enable the spread of disease and limit the effectiveness of outbreak responses.
* Infection Prevention and Control Specialists: Train and educate, audit and provide expert advice at all levels of the healthcare system to prepare for and respond to outbreaks.
* Water, Sanitation and Hygiene Specialists: Promote good hygiene practices, ensure access to sufficient clean and safe water
* Logistics and Security: Plan and collaborate with key stakeholders to acquire, manage and deliver life-saving supplies, manage the physical environment.
* Sanitation engineer
* Data Analyst
* Healthcare Providers
* Community Outreach
* Business Owner
* Banker
* Real Estate Agent
* Farmer
* Public Relations

**Lesson 2: What is Contagious? What Causes the Spread of Germs?**

**Problem statement:** How can we identify the cause of an unknown illness in such a way that illuminates strategies to prevent future outbreaks?

You have been feeling pretty awful for the last two weeks and can’t seem to shake whatever bug you’ve got. You decide to head into the local Kaiser Permanente clinic to get checked out. The waiting room seems more full than you would expect, and you have been told that it will be a longer than usual wait time. As you settle in, you look around and notice the room is bursting at the seams with people complaining of various symptoms. You are wondering what is going on with the community. Why are so many people sick right now? Who is responsible for the care of all of these people? You wonder if you all have the same illness, and start wondering about what you should be doing to keep yourself and your family healthy.

**Learning objectives:**

* Students will understand the meaning of “contagious”, and begin thinking about what causes the spread of germs while analyzing data from a graph.

**Lesson standards (NGSS, CCSS, CTE)**

**Health: H7.W2.8a:**

|  |  |
| --- | --- |
|  | Analyze how personal choices contribute to communicable and noncommunicable diseases.  **Science: NGSS Science and Engineering Practices**   * Asking Questions * Analyzing and Interpreting Data |

**Soft skills:**

Communication, Collaboration, Critical Thinking

**Locally and/or personally relevant for students:**

We are using a scenario that should feel familiar to the students; illness in our community and how it is impacting us and those around us.

**Connections to career and educational pathways:**

In this unit, we will have a chance to find careers in the medical field and in public health that impact us.

**Materials:**

Computer, the means to project an online video, data from a graph

**Lesson preparation:**

This lesson can be presented using Powerpoint Slides or Google Slides with links to videos and graphs.

**Time required:**

1 - 50 minute class period

**Grouping of students for instruction:**

For this lesson, students will be at their regular tables. They partner with students at their table for discourse.

**What is the instruction? Consider the PBL Procedure that is being addressed here:**

**Understanding the Problem**

|  |  |
| --- | --- |
| **Teacher** | **Student** |
| What do these things have in common? Smiling, Yawning, Memes, Fear, Gossip | Turn and talk, share out (Things that are contagious) |
| What would you add to this list? | Turn and talk, share out (Things that are contagious) |
| What does contagious mean?  After students define, read a dictionary definition.  con·ta·gious  /kənˈtājəs/  *adjective*   1. (of a disease) spread from one person or organism to another by direct or indirect contact. "a contagious infection" 2. Similar: 3. infectious 4. communicable 5. transmittable 6. transmissible 7. transferable 8. spreadable 9. catching 10. epidemic 11. pandemic 12. epizootic 13. infective 14. (of an emotion, feeling, or attitude) likely to spread to and affect others. "her enthusiasm is contagious" | Define |
| Read problem: You have been feeling pretty awful for the last two weeks and can’t seem to shake whatever bug you’ve got. You decide to head into the local Kaiser Permanente clinic to get checked out. The waiting room seems more full than you would expect, and you have been told that it will be a longer than usual wait time. As you settle in, you look around and notice the room is bursting at the seams with people complaining of various symptoms. You are wondering what is going on with the community. Why are so many people sick right now? Who is responsible for the care of all of these people? You wonder if you all have the same illness, and start wondering about what you should be doing to keep yourself and your family healthy. |  |
| Show video “Sheldon the Germaphobe” | <https://www.youtube.com/watch?v=HU4xmWwYA2A> Begin at 30 seconds. |
| State the lesson objective: Today, we are going to begin a series of lessons about an illness. We are going to begin to think about what is causing the illness and what can be done about it. |  |
| We will begin by looking at a graph and analyzing what it is telling us.  What do you notice? What do you wonder?   1. Does the 5 second rule apply? Comparing the colonies of bacteria on bologna that was not dropped on the floor, dropped on the floor for 5 seconds, and dropped on the floor for 50 seconds. | Students will look at a graph with their small group. Analyze and discuss.  <https://www.sciencenewsforstudents.org/blog/eureka-lab/five-second-rule-myth-busted#video> |
|  | Share with the class the analysis of their graph, and explain why they made their decisions. |
| Reread the problem.  Based on your prior experience, what do you think could be causing the illness at school? What information do you need to know more of? | Turn and talk, and share out. |

**Accommodations:**

* Larger font for students who are vision impaired
* Repetition of directions for individuals when needed
* Write on board for a second way to understand the information
* Show what you know in another way as a accommodation
* Have student repeat directions themselves out loud
* For ELL’s include language objectives along with content objectives
* For highly capable students include more higher level questions.

**Assessment:**

Students will share their ideas verbally, and record their thoughts in the science notebook for future reference.

**Lesson 3: 1918 Flu Simulation**

**Problem statement:**

You have been feeling pretty awful for the last two weeks and can’t seem to shake whatever bug you’ve got. You decide to head into the local Kaiser Permanente clinic to get checked out. The waiting room seems more full than you would expect, and you have been told that it will be a longer than usual wait time. As you settle in, you look around and notice the room is bursting at the seams with people complaining of various symptoms. You are wondering what is going on with the community. Why are so many people sick right now? Who is responsible for the care of all of these people? You wonder if you all have the same illness, and start wondering about what you should be doing to keep yourself and your family healthy.

**Learning objectives:**

* Model how an infectious disease can spread through a human population.

**Lesson standards (NGSS, CCSS, CTE):**

### [LS4.D: Biodiversity and Humans: Changes in biodiversity can influence humans’ resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling. *(secondary to MS-LS2-5)*](http://www.nap.edu/openbook.php?record_id=13165&page=166)

### CCSS Math Practice MP4. Modeling with Mathematics

**Materials:**

* 1918 Flu Simulation Classroom activity
* Sheets of adhesive stickers in two colors
* Timer

**Lesson preparation:**

* Prepare materials ensuring enough stickers for each student during 6 rounds.
* Read through procedure and prepare

**Time required:**

2 class periods

**Grouping of students for instruction:**

For the whole class simulation, the teacher will need to select one student as the virus transmitter.

**What is the instruction?**

**Understanding the Problem**

|  |  |
| --- | --- |
| **Teacher** | **Student** |
| |  | | --- | | Introduce the topic by soliciting responses to the following questions:   1. How can viruses move from person to person? 2. What are some ways of preventing viruses from infecting a person? 3. What vaccines do people have and for which diseases?   Establish ground rules for the activity.  You will be the official timekeeper and date recorder. Request a volunteer to be the virus carrier. Tell the class that they will be circulating around the room. At some point you will give a signal and the virus carrier will move quickly around the room and stick a sticker on the arm or hand of random students. Students should not avoid the virus carrier or actively seek out the virus carrier. | | Round 1: Give the virus carrier at least one same colored sticker for everyone in the class. Have the class begin circulating slowly and quietly. Start the timer and tell the virus carrier to begin applying stickers to as many students as possible. After 60 seconds say, stop and return to their seats. Ask all students with a sticker to raise their hand, multiple stickers are only counted once. | | Engage in the student discussion and adhere to established guidelines.  Create a data table to collect data after each round.  Participate in round 1 of the simulation and record data in the data table. |
| |  | | --- | | Round 2: In this round the virus carrier will carry three sheets of stickers of the same color as those in round 1. The first three classmates tagged are given one of these sheets. Each of them will sticker as many classmates as possible within the one-minute time. After 60 seconds, tally and record the number of individuals tagged. | | Participate in round 2 of the simulation and record data in the data table. |
| |  | | --- | | The next four rounds explore how a preventative measure(innoculation) affects how quickly a virus spreads through a population. Tell students that once inoculated, they must keep their inoculation stickers for the remaining rounds in order to stay protected. Give 20% of the class an inoculation sticker and have them put it on their right shoulder. The stickers should be a different color from the infection stickers.  Round 3 is a repeat of round 2 except some students are inoculated.  Round 4 is a repeat of round 3 with now 40% inoculated.  Round 5 is a repeat of round 4 with now 60% inoculated.  Round 6 is a repeat of round 5 with now 80% inoculated. | | Graph round 1 as a linear relationship between time and number of people infected.  Graph round 2 as an exponential relationship between time and number of people infected. |
| |  | | --- | | Discuss Rounds 1 and 2 as being models of an infectious disease at different stages.  The data should match this pattern roughtly:  *In Round 1, the virus carrier infects one person at a time, and the overall number of infected people grows arithmetically [i.e., 1, 2, 3, 4, 5]. In contrast, the multiple virus carriers in Round 2 infect the class more quickly, and the overall number of infected people grows geometrically [i.e., 1, 2, 4, 8, 16* | | Graph round 1 as a linear relationship between time and number of people infected.  Graph round 2 as an exponential relationship between time and number of people infected. |
| |  | | --- | | DAY 2: Divide the class into small groups and have them discuss questions. Ask them to summarize their main points in their handout.   1. Which of the game rounds more realistically represents an epidemic? Explain. 2. How do different levels of inoculation affect how a virus spreads through a population? 3. How could you change the game to make it more realistic? 4. List any methods that might help prevent an epidemic from spreading. 5. How do inoculations compare to other preventive measures, such as wearing a mask or washing hands, when it comes to reducing infections? 6. This activity represents one kind of model used in science teaching—a simulation of how a virus spreads. List some other examples of models used in science. Why do people use models? | | Discuss the questions with a small group and summarize the main points of discussion. |
| Facilitate a whole group discussion addressing each question and recording the main points on the board. | Communicate ideas and answer questions in a whole class discussion |

**Accommodations:**

For students who have graphic difficulties with pre-populated tables and labeled graphs.

Consider student behavior plans when determining the groupings of students and simulation.

**Extensions:**

As part of the logistics and securities team task force, consider the following scenario and develop a set of recommendations. Have the group present the proposal to the class:

The Chief Medical Officer is trying to keep healthcare costs down to meet a fixed budget. Describe how you would allocate money to manage a new flu epidemic. Show how you would appropriate the money (eg. 50% to immunize, 25% for quarantine, 10% for education, 15% for early aggressive treatment of ill people) and explain your allocations.

**Assessment:**

Student understanding will be demonstrated through data analysis that is recorded in a data table, and discussed in a google classroom discussion.

**References/Resources:**

NOVA scienceNOW: 1918 Flu https://www.pbs.org/wgbh/nova/education/activities/3318\_02\_nsn.html

**Lesson 4: Analyze Data from Local Clinic**

**Problem statement:** How can we identify the cause of an unknown illness in such a way that illuminates strategies to prevent future outbreaks?

You have been feeling pretty awful for the last two weeks and can’t seem to shake whatever bug you’ve got. You decide to head into the local Kaiser Permanente clinic to get checked out. The waiting room seems more full than you would expect, and you have been told that it will be a longer than usual wait time. As you settle in, you look around and notice the room is bursting at the seams with people complaining of various symptoms. You are wondering what is going on with the community. Why are so many people sick right now? Who is responsible for the care of all of these people? You wonder if you all have the same illness, and start wondering about what you should be doing to keep yourself and your family healthy.

**Learning Objectives:**

* Students will learn the definitions of infectious, communicable, and noncommunicable.
* Students will compare definitions.
* Students will analyze data from clinics to determine what illnesses were present.

**Lesson Standards (NGSS, CCSS, CTE):**

**Health: H7.W2.8a, H3.W4.8**

|  |  |
| --- | --- |
|  | * Analyze how personal choices contribute to communicable and noncommunicable diseases. * Investigate valid and reliable local health information.   **Science: NGSS Science and Engineering Practices**   * Asking Questions * Analyzing and Interpreting Data * Obtaining, Evaluating, and Communicating Information |

**Soft skills:**

Communication, Collaboration, Critical Thinking.

**Locally and/or personally relevant for students:**

We are using a scenario that should feel familiar to the students; illness in our community and how it is impacting us and those around us.

**Connections to career and educational pathways:**

In this unit, we will have a chance to find careers in the medical field and in public health that impact us.

**Materials:**

Computer, the means to project an online video, set of digital data and online data.

**Lesson preparation:**

This lesson can be presented using Google Slides with links to videos and the spreadsheet.

**Time required:**

1 - 50 minute class period

**Grouping of students for instruction:**

For the first lesson, students will be at their regular tables. They partner with students at their table for discourse.

**What is the instruction? Consider the PBL Procedure that is being addressed here:**

**Understanding the Problem**

|  |  |
| --- | --- |
| **Teacher** | **Student** |
| State the learning objective: Today, we are going to learn the definitions of   * Contagious * Infectious * Communicable * Noncommunicable     We will compare these definitions.  We will analyze data from local clinics to think about what kind of illnesses may be present, and what can be done about them. |  |
| What does contagious mean?  **con·ta·gious**  *adjective*  (of a disease) spread from one person or organism to another ***by direct or indirect contact***.  What does infections mean?  **in·fec·tious**  *adjective*  (of a disease or disease-causing organism) likely to be transmitted to people, organisms, etc., ***through the environment.***  What does communicable mean?  A **communicable disease**  *noun*  one that is ***spread from one person*** to another ***through a variety of ways*** that include: ***contact with blood and bodily fluids***; ***breathing in an airborne virus***; or by being ***bitten by an insect***.  What does noncommunicable mean?  A **noncommunicable disease** (NCD)  *noun*  a disease that is ***not transmissible directly from one person*** to another. NCDs include Parkinson's disease, autoimmune diseases, strokes, most heart diseases, most cancers, diabetes, chronic kidney disease, osteoarthritis, osteoporosis, Alzheimer's disease, cataracts, and others. | One word at a time:   1. Record your thoughts. 2. Read the actual definitions. 3. Compare them to each other. 4. Turn and talk, share out as a class. |
| Show a short video simulation “Sneezing on a Plane”.  <https://www.youtube.com/watch?v=ZlH60lm3mz0> | What do you notice?  What do you wonder?  Turn and talk, share out |
| Read problem: You have been feeling pretty awful for the last two weeks and can’t seem to shake whatever bug you’ve got. You decide to head into the local Kaiser Permanente clinic to get checked out. The waiting room seems more full than you would expect, and you have been told that it will be a longer than usual wait time. As you settle in, you look around and notice the room is bursting at the seams with people complaining of various symptoms. You are wondering what is going on with the community. Why are so many people sick right now? Who is responsible for the care of all of these people? You wonder if you all have the same illness, and start wondering about what you should be doing to keep yourself and your family healthy. |  |
| Share the data from local KP clinics. This data is available digitally but if printed, needs to be assembled (taped together) and posted as it is many pages. | Students can look at the data on their device, or go by table groups to look at the posted data.  What do you notice?  What do you wonder? |

**Accommodations:**

* Larger font for students who are vision impaired
* Repetition of directions for individuals when needed
* Write on board for a second way to understand the information
* Show what you know in another way as a accommodation
* For highly capable students include more higher level questions

**Assessment:**

Students will share their ideas verbally, and record their thoughts in the science notebook for future reference.

**Lesson 5: Clinic Data Discovery**

**Problem statement:**

How can we identify the cause of an unknown illness in such a way that illuminates strategies to prevent future outbreaks?

You have been feeling pretty awful for the last two weeks and can’t seem to shake whatever bug you’ve got. You decide to head into the local Kaiser Permanente clinic to get checked out. The waiting room seems more full than you would expect, and you have been told that it will be a longer than usual wait time. As you settle in, you look around and notice the room is bursting at the seams with people complaining of various symptoms. You are wondering what is going on with the community. Why are so many people sick right now? Who is responsible for the care of all of these people? You wonder if you all have the same illness, and start wondering about what you should be doing to keep yourself and your family healthy.

**Learning objectives:**

* Observe and interpret data from a graph.
* Identify data points from a graph and make predictions based on findings.
* Collaborate with a team to communicate findings and conclusions related to data.
* Engage in communication methods through reading, writing, speech and listening comprehension.

**Lesson standards (NGSS, CCSS, CTE):**

**CCSS HS Statistics and Probability:** Make inferences and justify conclusions from sample surveys, experiments, and observational studies

[**WHST.6-8.9** Draw evidence from informational texts to support analysis, reflection, and research.](http://www.corestandards.org/ELA-Literacy/WHST/6-8) *(MS-ETS1-2)*

[**CCSS.Math.Content.7.SP.A.2**](http://www.corestandards.org/Math/Content/7/SP/A/2/)

Use data from a random sample to draw inferences about a population with an unknown characteristic of interest.

**CCSS ELA.8.1.a** Introduce claim(s), acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.

**Soft skills:**

Communication, Collaboration

**Locally and/or personally relevant for students:**

Co-Vid 19 is a pandemic that personally impacted students and information is given by the local university in the Seattle region. Data was provided from the regionally clinic.

**Connections to career and educational pathways:**

Students will learn about careers pathways of different people who are involved with public health particularly in an outbreak situation. Career profiles will be provided and student choice in the role that they would like to explore further.

**Materials:**

Who is involved in an outbreak survey results, Kaiser Permanente Data Results.

**Lesson preparation:**

Prepare copies or post Career Profiles for students, prepare survey and plan for groupings based upon results

**Time required:**

3 class periods

**Grouping of students for instruction:**

Groups of up to 6 in interest groups from survey.

**What is the instruction? Consider the PBL Procedure that is being addressed here: Exploring**

**Understanding the Problem**

|  |  |
| --- | --- |
| **Teacher** | **Student** |
| Prior to Day 1: Administer the “Who is involved in an outbreak survey” either as homework or as an entry task prior to presenting the data. Place students into groups with balanced choices for each of the careers. | Read through and select desired career pathway for this task. |
| Day 1: Show the IMHE graph so that students are familiar with the process of investigating data and working through the questioning/communication of:   1. What do you notice? *If you make a claim, tell us what you noticed that supports your claim.* 2. *What do you wonder? What are you curious about that comes from what you notice in the graphs?* | Investigate the IMHE graph and answer these three questions:   * What do you notice? *If you make a claim, tell us what you noticed that supports your claim.* * What do you wonder? *What are you curious about that comes from what you notice in the graphs?* * What’s going on in this graph? Write a catchy headline that captures the graphs’ main idea. |
| Review how to read a graph, define x and y-axis, uncertainty, trends.  Allow students to explore and direct focus to identification of specific data values. | Identify data points and use the information to make predictions related to the trend line data.  Answer the question: What would need to happen for the data pattern to change? What healthcare precautions would need to happen for the trend line to go from a positive slope to a negative slope? |
| Day 2: Present students with data from the Kaiser Permanente Clinic and have them go through the Notice and Wonder with no further guidance. Let them explore the document and make their observations for the first 25 minutes.    After 25 minutes, scaffold students to direct their attention to the sections relating codes of care as well as looking at the symptoms. | Study the data from Kaiser Permanente’s clinics across the state to determine what codes are trending, and where the issues are occurring. |
| Day 3: Have students write their report of their proposed findings to be handed in as a collaborative team effort at the end of the class period. | Collaborate with team members to justify and communicate any findings and conclusions related to the data from Kaiser Permanente as it relates to the problem statement. |

**Accommodations:**

For students with writing goals, provide sentence starters specific to the lesson impaired

Allow for demonstration of communication in verbal, written or typed format.

For students with SPED needs, limit the data set given.

**Assessment:**

Students will be assessed on their collaborative document presenting their conclusions and findings.

**References/Resources:**

WABS Kaiser Permanente Data Set File

Outbreak Team Career Profiles

Website for the Institute for Health Metrics and Evaluation.[www.healthdata.org](http://www.healthdata.org).

**Extensions**

Students are directed to look at other sources that may have similar data and compare the data displays.

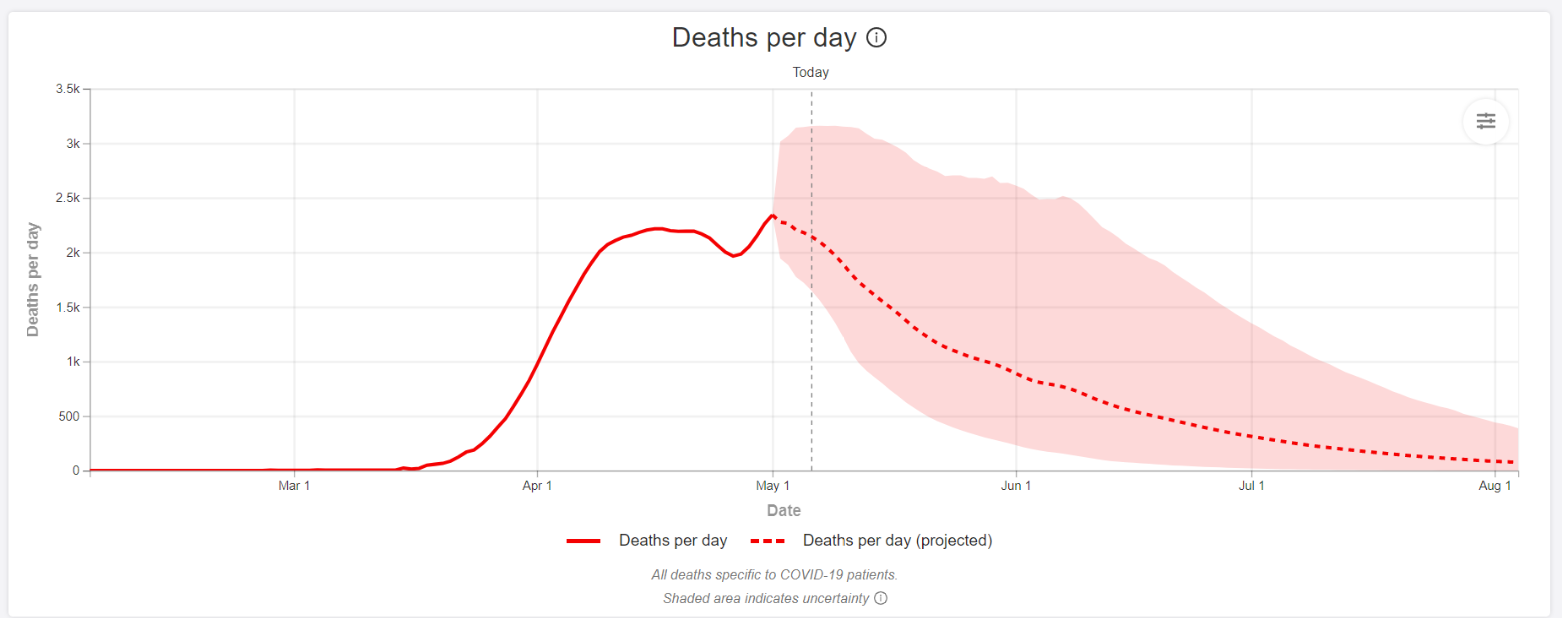
Fiction writing. Design a made up scenario where a virus inundated a city with the protagonist as a researcher discovering data for the community.

Research philanthropic organizations such as the Bill and Melinda Gates foundation. Investigate endowments and grants related to health outreach.

**Survey Options:**

1. Clinicians: Develop and review treatment guidelines, plans and infection prevention and control measures.
2. Epidemiologists: Use data to generate information about infectious diseases
3. Microbiologist: Provide disease identification and molecular tracing of strains in an outbreak
4. Social Scientist: Investigate social. political and economic factors that enable the spread of disease and limit the effectiveness of outbreak responses.
5. Infection Prevention and Control Specialists: Train and educate, audit and provide expert advice at all levels of the healthcare system to prepare for and respond to outbreaks.
6. Water, Sanitation and Hygiene Specialists: Promote good hygiene practices, ensure access to sufficient clean and safe water
7. Logistics and Security: Plan and collaborate with key stakeholders to acquire, manage and deliver life-saving supplies, manage the physical environment.

IMHE Graph:



**Lesson 6: Collecting Information about an Illness: Typhoid**

**Problem statement:** How can we identify the cause of an unknown illness in such a way that illuminates strategies to prevent future outbreaks?

You have been feeling pretty awful for the last two weeks and can’t seem to shake whatever bug you’ve got. You decide to head into the local Kaiser Permanente clinic to get checked out. The waiting room seems more full than you would expect, and you have been told that it will be a longer than usual wait time. As you settle in, you look around and notice the room is bursting at the seams with people complaining of various symptoms. You are wondering what is going on with the community. Why are so many people sick right now? Who is responsible for the care of all of these people? You wonder if you all have the same illness, and start wondering about what you should be doing to keep yourself and your family healthy.

**Learning Objectives:**

* Students will learn about an illness called typhoid.
* Students will collect information and prepare to compare similar information from other illnesses in order to help make decisions about what is going on in the unit phenomenon.

**Lesson Standards (NGSS, CCSS, CTE):**

**Health: H7.W2.8a, H4.W5.8**

|  |  |
| --- | --- |
|  | * Analyze how personal choices contribute to communicable and noncommunicable diseases. * Demonstrate communication skills to enhance health and to avoid or reduce health risks.   **Science: NGSS Science and Engineering Practices**   * Asking Questions * Analyzing and Interpreting Data |

**Soft skills:**

Communication, Collaboration, Critical Thinking.

**Locally and/or personally relevant for students:**

We are using a scenario that should feel familiar to the students; illness in our community and how it is impacting us and those around us.

**Connections to career and educational pathways:**

In this unit, we will have a chance to find careers in the medical field and in public health that impact us.

**Materials:**

Computer, the means to project a slideshow lesson, reading “The Case of the Contaminated Cook” either in printed form or digital, accompanying worksheet either as a Google assignment or in printed form.

**Lesson preparation:**

This lesson can be presented using Google Slides with links to videos and graphs.

The reading and worksheet could be printed in hard copy if desired.

**Time required:**

1 - 50 minute class period

**Grouping of students for instruction:**

Students will partner to read the article, and for discourse.

**What is the instruction? Consider the PBL Procedure that is being addressed here:**

**Understanding the Problem**

|  |  |
| --- | --- |
| **Teacher** | **Student** |
| Make a table in your science notebook. It should have 5 columns titled:  Illness  Symptoms  Treatment  Prevention  Fatality Rate  (Example can be displayed.) | Draw table in science notebook. |
| State the lesson objective:  Today we are going to learning about an illness called typhoid.  We are going to create a table in our science notebook that we will use to record information about this illness. We will continue to use this table in future lessons to record information about other illnesses as we learn about them.  We will then use these facts to compare and contrast different illnesses. We will use them to draw a conclusion about the unknown illness in our phenomenon. |  |
| Read problem: You have been feeling pretty awful for the last two weeks and can’t seem to shake whatever bug you’ve got. You decide to head into the local Kaiser Permanente clinic to get checked out. The waiting room seems more full than you would expect, and you have been told that it will be a longer than usual wait time. As you settle in, you look around and notice the room is bursting at the seams with people complaining of various symptoms. You are wondering what is going on with the community. Why are so many people sick right now? Who is responsible for the care of all of these people? You wonder if you all have the same illness, and start wondering about what you should be doing to keep yourself and your family healthy. |  |
| Read the story “The Case of the Contaminated Cook”.  <https://documentcloud.adobe.com/link/track?uri=urn%3Aaaid%3Ascds%3AUS%3Ad783cd38-185d-40c5-904a-905d7ef56159> | Read the story with a partner. |
| Discuss at your table.  Answer the questions on the worksheet.  <https://docs.google.com/document/d/1QLFLlrwXlc4x9aIF1lYnKxwgxIEWSR_fAKSRXG40-H0/edit> | Discuss the story at their table.  Complete the worksheet while discussing with their table group. |
| Go to the table in your science notebook.  Make a row for typhoid. Fill in each column across the row. | Complete the first row of the table for the illness of typhoid. |

**Accommodations:**

Larger font for vision impaired

Repetition of directions for individuals when needed

Write on board for a second way to understand the information.

Show what you know in another way as a accommodation

Have students repeat directions themselves out loud.

**Assessment:**

Students will share their ideas verbally, and record their thoughts in the science notebook for future reference.

**Lesson 7: Investigating a Variety of Illnesses**

**Problem statement:**

How can we identify the cause of an unknown illness in such a way that illuminates strategies to prevent future outbreaks?

You have been feeling pretty awful for the last two weeks and can’t seem to shake whatever bug you’ve got. You decide to head into the local Kaiser Permanente clinic to get checked out. The waiting room seems more full than you would expect, and you have been told that it will be a longer than usual wait time. As you settle in, you look around and notice the room is bursting at the seams with people complaining of various symptoms. You are wondering what is going on with the community. Why are so many people sick right now? Who is responsible for the care of all of these people? You wonder if you all have the same illness, and start wondering about what you should be doing to keep yourself and your family healthy.

**Learning objectives:**

* Investigate an illness
* Analyze the information, compare data from the different illnesses investigated, and begin to think about the unit phenomenon and the data from the local KP clinics

**Lesson standards (NGSS, CCSS, CTE):**

**Health: H3.W4.8. H4.W5.8**

|  |  |
| --- | --- |
|  | * Investigate valid and reliable local health information. * Demonstrate communication skills to enhance health and to avoid or reduce health risks.   **Science: NGSS Science and Engineering Practices**   * Asking Questions * Analyzing and Interpreting Data * Constructing Explanations * Engaging in Argument from Evidence * Obtaining, Evaluating, and Communicating Information |

**Soft skills:**

Communication, Collaboration, Critical Thinking.

**Locally and/or personally relevant for students:**

We are using a scenario that should feel familiar to the students; illness in our community and how it is impacting us and those around us.

**Connections to career and educational pathways:**

In this unit, we will have a chance to find careers in the medical field and in public health that impact us.

**Materials:**

Computers for students to use for research

**Lesson preparation:**

This lesson can be presented using Google Slides

**Time required:**

1 - 50 minute class period

**Grouping of students for instruction:**

Students may choose to work alone, work with a partner, or work with a group up to 4.

**What is the instruction? Consider the PBL Procedure that is being addressed here:**

**Understanding the Problem**

|  |  |
| --- | --- |
| **Teacher** | **Student** |
| Entry task:  What trends do you remember from the data of the clinics? | Private think time.  Talk with partner.  Share out. |
| Review how germs spread, meaning of communicable with video.  How do germs spread  <https://www.heraldextra.com/entertainment/relax/byu-grads-science-video-shows-just-how-easily-germs-spread/article_74d54f7d-1bcf-5942-9f67-1c7d2c3ca879.html>  Is is communicable or noncommunicable  <https://www.youtube.com/watch?v=vpEAos0blyw&feature=youtu.be> | Turn and talk, share out |
| State the lesson objective:  We will investigate a variety of illnesses and facts about them.  We will analyze our information, compare data, and begin to think about what decisions we can make about our unit phenomenon and the data in our local clinics. |  |
| Read problem: You have been feeling pretty awful for the last two weeks and can’t seem to shake whatever bug you’ve got. You decide to head into the local Kaiser Permanente clinic to get checked out. The waiting room seems more full than you would expect, and you have been told that it will be a longer than usual wait time. As you settle in, you look around and notice the room is bursting at the seams with people complaining of various symptoms. You are wondering what is going on with the community. Why are so many people sick right now? Who is responsible for the care of all of these people? You wonder if you all have the same illness, and start wondering about what you should be doing to keep yourself and your family healthy. |  |
| Your next task is to choose an illness to investigate.  You may work alone or with a partner.  Choose one of the following illnesses to investigate. You are going to look for facts that can fill in the data table:  Symptoms, treatment, prevention, fatality rate.  Choose one of the following illnesses to investigate.  **Legionnaires disease**  **Tuberculosis**  **Botulism**  **Food poisoning**  **Cholera**  **Measles**  **Flu (different types)**  **Other ideas?**  ***Or research causes of symptoms found in the clinic*** | Students choose illness to investigate.  There should be many illnesses chosen so students have a chance to share their information with the class and they have enough to discuss to have the ability to engage in an argument based on their findings and the findings of others.  Work together with another student or small team of students.  Find: symptoms, treatment, prevention, and fatality rate of the disease being investigated. |
| As a whole class, share findings. Fill in the table for as many illnesses as possible. | Fill in table in their science notebooks. |
| Begin to consider how any of the information from the illnesses may match any of the data taken from our local KP clinics. |  |

**Accommodations:**

Larger font for vision impaired

Repetition of directions for individuals when needed

Write on board for a second way to understand the information.

Show what you know in another way as a accommodation

For highly capable students include more higher level questions.

**Extensions:**

Students who finish researching one illness may choose another to research, or may go further in their research.

**Assessment:**

Students will record their research in their science notebooks. They will share verbally with the class, and it will be recorded on a class chart. All students will record facts from all illnesses researched in the data tables in their science notebooks.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Formative Assessment in the Lessons

Summative Assessment for the Unit

**Lesson 8: Pandemic Town Hall**

**Problem statement:** You have been feeling pretty awful for the last two weeks and can’t seem to shake whatever bug you’ve got. You decide to head into the local Kaiser Permanente clinic to get checked out. The waiting room seems more full than you would expect, and you have been told that it will be a longer than usual wait time. As you settle in, you look around and notice the room is bursting at the seams with people complaining of various symptoms. You are wondering what is going on with the community. Why are so many people sick right now? Who is responsible for the care of all of these people? You wonder if you all have the same illness, and start wondering about what you should be doing to keep yourself and your family healthy.

This lesson will focus on recognizing the unique interests and needs of members of a community when addressing a possible pandemic.

**Learning objectives:**

1. Students will be able to research and identify different perspectives related to healthcare during a health crisis
2. Students will be able to articulate the perspective of their given persona in a town hall setting.

**Lesson standards (NGSS, CCSS, CTE):**

[**MS-ETS1-2 Engineering Design**](https://www.nextgenscience.org/pe/ms-ets1-2-engineering-design)

* Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

**Soft skills:**

Communication: citing data, using appropriate vocabulary, providing unique perspectives to a diverse audience

Critical Thinking: identifying patterns, making predictions or inferences about potential problems and solutions

Collaboration: comparing ideas and coming to an agreement on a resolution

**Locally and/or personally relevant for students:**

Background to local businesses and organizations:

1. Kaiser Permanente - a local healthcare provider
2. King County Public Health - organization that protects and improves the health of King County residents through protection, promotion, and provision of health related services

The town hall also includes local business owners and local government officials so that students can consider their perspectives in addressing the community’s concerns.

**Connections to career and educational pathways:**

Introduction to health related careers in the public and private sector including: epidemiology, health administration, nursing, materials management, emergency medical services, etc.

**Materials:**

* Podium
* Role cards
* Epidemic Video: <https://www.youtube.com/watch?v=UG8YbNbdaco>

**Lesson preparation:**

* Print and Cut out Role Cards
* Pre-assign roles or determine how roles will be selected

**Time required:**

Two 50 minute periods

* first 50 minutes - student preparation for town hall
* second 50 minutes - town hall and reflection activity

**Grouping of students for instruction:**

Each student will choose or be assigned a role in the town hall. The teacher may want to designate roles based on the likely amount of necessary airtime in the town hall.

**What is the instruction? Consider the PBL Procedure that is being addressed here:**

**Part 1: Exploring the Problem**

|  |  |
| --- | --- |
| **Teacher** | **Student** |
| Introducing the problem using the launch video: | Students are:   1. Noticing 2. Wondering 3. What might be going on? |
| Assigns or facilitates the distribution of roles for the Town Hall | Considering what role they will play in the Town Hall and asking questions about their role as necessary. |
| Providing resources that give background and meaning to the problem through the following sites… | Brainstorming what they already know and what they need to know about this problem, and what information will be helpful to further the most important cause for their given role. |
| Checking in on student progress and preparation, and providing additional guidance and support as necessary | Checking in with their teacher to determine what else is needed to be ready for the Town Hall |

**Part 2: Resolving the Problem**

|  |  |
| --- | --- |
| **Teacher** | **Student** |
| Teacher asks the Mayor to Bring the Town Hall Meeting to Order | Students are:   * Listening to the directions of the mayor * Preparing to share their perspective |
| Teacher is monitoring student participation, jumping in as necessary to move discussion forward or to address inappropriate student responses. If necessary, teacher should prompt students towards a final course of action if there are less than 10 minutes in the Town Hall. | Students are:   * Listening to the directions of the mayor * Sharing their perspective as necessary * Asking questions of the speaker * Providing their data or information relevant to the topic of discussion |
| Teacher will ask students to draft a resolution and vote on it as a community. | Students are:   * Creating the resolution for action by identifying key components/ideas to implement * Voting on the final resolution |
| Teacher is prompting students to complete the reflection task | Students are completing the reflection task |

**Reflection Activity:**

Create a campaign ad, song, or letter to the editor that addresses the following questions:

1. Who keeps our community safe?
2. How do we identify there is a problem?
3. What is the problem in our town?
4. How should we solve it?

**Role Expectations**

1. City Council

1. Write a one paragraph summary of your personal background that will be read at the beginning of the meeting. (do not just copy your data card)
2. Listen to all testimony and statements
3. Dress in costume
4. Ask questions of the speakers – you must have a minimum of 5 thoughtful questions written out prior to the meeting.
5. Vote and announce decision at the end of the meeting
6. Create a name tag so that others can address you by name

2. Business and Government Representatives

1. Write and give a two paragraph speech in support of a particular view.
2. Prepare questions to ask people with the opposing view
3. Dress in costume

3. News Reporters

1. Write a 1-2 page news article about the town hall meeting. You should summarize the various speeches, and the council’s decision. You will take notes during the meeting and your report will be due the day following the town meeting.

4. Magazine Reporters

1. Write a 1-2 page personal impact story describing the potential consequences for local workers, residents, or school children. You will need to conduct interviews of the town hall participants. Your story will be due the day of the town hall meeting.

5. Concerned Citizens

1. Write a 1-2 page letter to the editor of your local newspaper or commissioner in support of a particular point of view. Your letter will be due the day of the town hall meeting.

6. City Secretary

1. Facilitate Town Hall meeting

· Create seating arrangement for Council members

* Introduce City Council members

· Prepare order of speakers

· Keep appropriate time and manage the flow of the meeting

1. Announce speakers to the council
2. Create an emblem that will be attached to the podium for the meeting

**Personal Data Cards - City Council**

Jamie Jorgenson. Restaurant Owner (City Council - favors less intervention)

You have been in business in Lovely Town for the last 10 years. Your business is doing well, but you have concerns about city intervention limiting the number of people that visit your restaurant

Rafael Ramirez, Merchant (City Council - undecided)

You are 52 and own a local grocery store. You are concerned about what you will need to do as a business owner to keep your store open while protecting your employees and customers. Your mother is immuno-compromised.

Micah Jackson, Real Estate Agent (City Council - favor less intervention)

You were born and raised in this town. You remember when the news made a big deal about the Swine Flu back in the late 2000’s and yet you didn’t know anyone who got it. You do not want your day to day life to change, and do not see why it needs to.

Issac Fredrickson, Farmer (City Council - undecided)

You own and operate a large farm just outside of the town. You are concerned about any viruses and whether or not they could spread to your livestock. Many of your workers do not have health insurance, and you are aware that many of them would not be able to afford to take time off of work due to illness.

Chrissy Penny, Banker (City Council - undecided)

You are 35 old and as a banker you have provided home and car loans for most of the people in town. You are worried that if too many people are unable to work, they may default on their bank loans.

Stacy Bones, Md., Doctor (City Council - favor more intervention)

You are 30 years old and recently moved to town to work at the local hospital. You have noticed an uptick in critical care patients in the last few weeks, and you are concerned about whether there will be enough staff to support the increase in patients.

Willie Stouts, Mayor (City Council - undecided)

You are 68 years old and have been the mayor for the last 13 years. You trust the local business owners and are well liked by people in the town. They say you could sell ice to an eskimo, but it is hard to change your mind once it is made up.

**Personal Data Cards - Business Representatives**

Ollie Fogie, Resident (for interventions)

You are an 84 year old who is “fit as a fiddle” but your doctor has warned you to keep an eye out for the weird illness going around. You had some bronchitis issues a few years back and are careful not to touch your face or eat without washing your hands first.

Frannie “Flyer” Jones, Adrenaline Junkie (favor less interventions)

You are a wild one! Nothing holds you back and the world is your oyster. You get outside every chance you can and love to hold huge parties on your 10 acres of land. Your barbeques are legendary and people from around the county always show up uninvited. You don’t like the idea of seeming unwelcoming, and always embrace new-comers with open arms (literally).

Tommy Carter, Supply Chain Manager for the Local Hospital (favor interventions)

This is your tenth year of working for the local hospital and you love your job. Your focus is on getting everyone the stuff they need to keep the hospital running smoothly. Recently the hospital has needed additional personal protective equipment (PPE) to handle patients with the strange new illness going around. Lately the PPE has been harder to come by, and you are worried that at this rate you will run out of supplies.

Heidi Heart, President of the Nurses’ Union (favor interventions)

You represent over 300 nurses in the local bargaining union. Your members have been complaining about lack of equipment and a strange new illness that has put three of your members in critical care in the last two weeks. Nurses are worried about not being protected and possibly spreading the illness to their families.

Kahlial Koda, County Health Department Head (undecided)

You have an interest in preserving the health and wellbeing of citizens of your county. Recent reports have shown an uptick in illnesses in Lovely Town, and you want to offer the support of the county health department. You want to know what specific issues they are facing and in return will provide appropriate supplies and manpower.

Polly Pollen, Garden and Floral Emporium Owner (against interventions)

You are a 48 year old florist, and don’t see what all the fuss is about. It is the start of the height of your business season and people are lining up at your doors to start their outdoor projects. All of the symptoms that people are describing make sense - it is allergy season. You see no reason to close up shop, and doing so now would likely bankrupt you and put your 18 employees out of work.

Sherlock Murdoch, Data Scientist (for using data to decide on intervention)

You love fun graphs and facts. You are observant and good at collecting information to arrive at a conclusion that is based on evidence. That’s difficult sometimes. Opinion can be biased, data can be biased, but it’s a lot harder to make up data because scientists have to show their work. You have been tracking the number of cases, outcomes, medical resources, trends, and public opinions. You are seeing a downward trend in cases but caution that we have to be prepared for another spike.

**Accommodations:**

* Sentence stems provided for Notice, Wonder, and Story prompts
* Graphic Organizer and Rubric for Exploring Phase
* Provided resources for Exploring Phase
* Intentional choice of roles (possible student selection of roles)

**Accommodations:**

Larger font for vision impaired

Repetition of directions for individuals when needed

Write on board for a second way to understand the information.

Show what you know in another way as a accommodation

**Extensions:**

1. Ask students to create a formal draft of their proposal to share with local public health, and private healthcare groups.
2. Ask students to create a social awareness campaign to address how to prevent or slow the spread of a pandemic.

**Assessment:**

Students will be assessed on their participation within the Town Hall and their reflection on the final resolution.

**References/Resources:**

Town Hall Instructional Plan Adapted from To Zone or Not to Zone (TZONZ) lesson created by Holly Odle.

**Lesson 9: Public Messaging**

**Problem statement:** How can we identify the cause of an unknown illness in such a way that illuminates strategies to prevent future outbreaks?

You have been feeling pretty awful for the last two weeks and can’t seem to shake whatever bug you’ve got. You decide to head into the local Kaiser Permanente clinic to get checked out. The waiting room seems more full than you would expect, and you have been told that it will be a longer than usual wait time. As you settle in, you look around and notice the room is bursting at the seams with people complaining of various symptoms. You are wondering what is going on with the community. Why are so many people sick right now? Who is responsible for the care of all of these people? You wonder if you all have the same illness, and start wondering about what you should be doing to keep yourself and your family healthy.

**Learning Objectives:**

* Compare different public messages for usefulness in the community
* Determine how different populations respond to different public messages
* Engage in the discussion by listening and contributing

**Lesson Standards (NGSS, CCSS, CTE):**

**CTE Vocational skills of visual arts. CCSS ELA.8.1.a**

|  |  |
| --- | --- |
|  | * In the discussion make yourself prepared in advance by reading the articles that have evidence in them, probe and then reflect on public messaging ideas that are under discussion. Stay on topic. |

**Soft skills:**

* Communication (listening, speaking, reading, and writing)
* Creativity in terms of the public service message that each group designs

**Locally and/or personally relevant for students:**

We are using a scenario that should feel familiar to the students; illness in our community and how it is impacting us and those around us.

**Connections to career and educational pathways:**

In this unit, we will have a chance to find careers in the medical field and in public health that impact us.

**Materials:**

note-taking supplies, writing journal, art supplies, poster board paper, K-W-L chart paper

**Lesson preparation:**

How does Seattle-King County Public Health keep our community safe through public messaging to all citizens? Public messaging is the ability to communicate a message through a medium to different audiences and succeed in changing behavior to healthful choices during a pandemic.

**Time required:**

1-2 Class periods of 50 minutes each

**Grouping of students for instruction:**

Teacher chosen or student chosen based on class make-up.

**What is the instruction? Consider the PBL Procedure that is being addressed here:**

**Understanding the Problem**

|  |  |
| --- | --- |
| **Teacher** | **Student** |
| Discuss public messaging at Seattle-King County Public Health. Review vocabulary from the unit. Add to the list if students think of more important words.   1. quarantine 2. isolation 3. prevention 4. symptoms 5. contagious 6. infectious 7. communicable 8. noncommunicable | Review and write definitions of academic and language words after the teacher reviews words.  Think of other words to add to our list from our unit. |
| Introduce concepts of effective messaging: high contrast, color usage, reduced vision accommodations, use of pictures, and core messaging.  Example from King County Public Health, face mask poster:  <https://www.kingcounty.gov/depts/health/covid-19/care/~/media/depts/health/communicable-diseases/documents/c19/poster-mask-directive.ashx> | Students brainstorm what they already know about what color combinations work well together and what strategies make a poster easily accessible to all. |
| What is public messaging?  What are some examples of public messaging?  (If links are no longer valid, search for public message images.)  Example from WHO, Stay Home, Save Lives:  <https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.blog.google%2Finside-google%2Fcompany-announcements%2Fcovid-19-how-were-continuing-to-help%2F&psig=AOvVaw0ZP7qoaC94dBLviA3OhVIB&ust=1589996385953000&source=images&cd=vfe&ved=0CAIQjRxqFwoTCICsrKG8wOkCFQAAAAAdAAAAABAD>  Example from Inmar Intelligence, communicating with care:  <https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.inmar.com%2Fblog%2Fthought-leadership%2Fcovid19%2Fcommunicating-care-three-principles-effective-messaging-during-covid-19&psig=AOvVaw0ZP7qoaC94dBLviA3OhVIB&ust=1589996385953000&source=images&cd=vfe&ved=0CAIQjRxqFwoTCICsrKG8wOkCFQAAAAAdAAAAABAT>  Example, posted handwashing reminder:  <https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.npr.org%2Fsections%2Fhealth-shots%2F2020%2F03%2F03%2F811656226%2Fpandemic-panic-these-5-tips-can-help-you-regain-your-calm&psig=AOvVaw0ZP7qoaC94dBLviA3OhVIB&ust=1589996385953000&source=images&cd=vfe&ved=0CAIQjRxqFwoTCICsrKG8wOkCFQAAAAAdAAAAABAO>  Additional resources in Teacher Materials.  Why is it important in a pandemic such as the one we are currently going through in 2020? | Students will compare and contrast different public messages and tell which ones are most effective given the targeted population.  Students will brainstorm messages that are important to share during a pandemic   * suggestions for preventions of the spread of illness * words of encouragement * etc. |
|  | Each group makes a public message poster communicating core safety to other students regarding the 2020 pandemic. |

**Accommodations:**

Larger font for vision impaired

Repetition of directions for individuals when needed

Write on board for a second way to understand the information.

Show what you know in another way as a accommodation

**Extensions:**

Extend the lesson by asking students to promote the student store and create some public messaging signs to increase profits for the student body.

**Assessment:**

Students will share their ideas verbally, and record their thoughts in the science notebook for future reference.

**References/Resources:**

* Go to Seattle-King County Public Website and find out the recommended precautions for the pandemic.
* Call the clinic for King County Public Health and ask to speak to a nurse about which precautions are the most important and for which segments of the population.
* Go to a medical textbook or website and review technical language and convert it to casual language for common consumption.
* Look up data at Washington State Department of Health website for evidence of “best practices” and goal setting for the community reduction of virus.

1. The sub-sections of the procedure section (e.g., Understand the Problem, Explore the Problem) are from the Illinois Math and Science Academy’s PBL Teaching and Learning Template, however, the descriptions were developed by WABS and do not necessarily represent the views of IMSA. [↑](#footnote-ref-0)