**Lesson 2: PANDEMIC Introduction to PBL**

**Problem statement:**

Imagine you are an epidemiologist--someone who studies the spread and control of diseases. You work for the Centers for Disease Control and Prevention in Atlanta, GA. Reports of middle school students out sick have been pouring in from all over the country at an alarming rate. Few things are known about this mystery disease: victims are experiencing chills and high fever, and the disease is spreading quickly. There are no recorded fatalities, but there are reports of more extreme symptoms such as paralysis. Your team has been tasked with understanding and containing this new infectious disease. Your director has handed you a document with notes to start with, but it is up to you to come up with a plan to prevent, contain, or cure the disease. Time is of the essence, as symptoms are starting to appear in adults and high school students as well.

**Learning objectives:**

Students will be able to use their schema to brainstorm what information they will need to start answering the problem statement.

* 1. Students brainstorm what information they’ll need to start answering the problem statement
  2. Ask questions
  3. Define and refine the problem

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

**Next Generation Science Standards**

*6-8 Ask Questions*

1. that arise from careful observation of phenomena, models, or unexpected results, to clarify and/or seek additional information.
2. Define a design problem that can be solved through the development of an object, tool, process or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions.

**Common Core State Standards**

*Math Practices*

1. MP.1Make sense of problems and persevere in solving them

**Career and Technical Education**

*Career Ready Practices*

1. Communicate Clearly, effectively, and with reason
2. Utilize critical thinking to make sense of problems and persevere in solving them
3. Work productively in teams while using cultural/global competence

**Soft skills:**

**21st Century Skills**

*Learning and Innovation*

1. Creativity and innovation
2. Critical thinking and problem solving
3. Communication and collaboration

*Life and Career*

1. Social and cross-cultural skills
2. Flexibility and adaptability
3. Productivity and accountability

**Materials:**

* [Video Notes Questions](https://docs.google.com/document/d/1WIm1jOj9tuFF8RVMNSFlUKL7cCGPCB2lu38x46_ikk4/edit?usp=sharing)
* Chart paper
* Markers
* Computer with internet access
* Audio system
* Projector

**Lesson preparation:**

* Set norms for group work
* Copy video questions
* Que up video clip
* Prepare poster paper with the following questions:
  + What do you already know about epidemics and pandemics?
  + What questions do you need to know to be able to solve this problem?
  + What questions do you still have?

**Time required:** 45 minutes

**Grouping of students for instruction:**

Small groups (4-5 students per group)

Protocol that will help groups function smoother:

* Everyone leaning in
* Shared speaking time - equal voice
* No cross talk
* pass the pen so everyone is writing

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

Understanding the Problem

|  |  |  |
| --- | --- | --- |
| **Time** | **Teacher** | **Student** |
| **5 min** | Introduce the problem   * Distribute [questions](https://docs.google.com/document/d/1WIm1jOj9tuFF8RVMNSFlUKL7cCGPCB2lu38x46_ikk4/edit?usp=sharing) before starting the video * YouTube Video - [Flu Attack! How a Virus Invades Your Body](https://www.youtube.com/watch?v=Rpj0emEGShQ&feature=youtu.be) (3:38) (<https://goo.gl/91Rv4k>) | Students will watch to the video and take notes on the following questions:   1. How does the flu virus multiply? 2. How is the flu virus spread? 3. Why don’t we die when we contract the flu virus? 4. What is the flu viruses main purpose? |
| **7 min** | Group discussion of answers to video notes | Students share their notes   * Each member in the group should have the same answer * If there’s a disagreement, students should consult another group or rewatch the video * Once all answers are the same, students staple their answer sheets together and turn them in. |
| **2 min** | **Introduce Problem Statement**  Imagine you are an epidemiologist--someone who studies the spread and control of diseases. You work for the Centers for Disease Control and Prevention in Atlanta, GA. Reports of middle school students out sick have been pouring in from all over the country at an alarming rate. Few things are known about this mystery disease: victims are experiencing chills and high fever, and the disease is spreading quickly. There are no recorded fatalities, but there are reports of more extreme symptoms such as paralysis. Your team has been tasked with understanding and containing this new infectious disease. Your director has handed you a document with notes to start with, but it is up to you to come up with a plan to prevent, contain, or cure the disease. Time is of the essence, as symptoms are starting to appear in adults and high school students as well. |  |
| **15 min** | Facilitating a discussion in small groups (4-5 people)   * What do you already know? * What information do we need to be able to solve this problem? * What questions do you still have?   Help students get to the idea that they need to know how diseases are spread, contained, and cured. | Brainstorming what they already know and what they need to know about this problem. Jot ideas on paper as they come up with them |
| **10 min** | Facilitate whole group discussion - gallery walk | Share out ideas   * Walk clockwise around the room adding one note to the posters with each question. * Keep rotating around the room until all notes are recorded * If another group has the same idea as you add a tally/check mark. |
| **5 min** | Closure   * Restate problem statement * Recap brainstorm * Prepare students for tomorrow’s research   + Tomorrow we’re going to be answering some of the questions you identified today. |  |

**References/Resources:**

1. [Student Video Notes](https://docs.google.com/document/d/1WIm1jOj9tuFF8RVMNSFlUKL7cCGPCB2lu38x46_ikk4/edit?usp=sharing)
2. [Teacher Presentation](https://docs.google.com/presentation/d/1VgRYYySXOVzcOeMtkjhQj2i_oj6I1rPB2sLCipvyW9Y/edit?usp=sharing)