**Lesson 2: Gathering Background Information- Infectious Disease**

**Problem statement:** restate problem statement with a focus on how each lesson fits into problem statement

A well-known, large tech company recently released a much anticipated social media app. Shortly after its’ release users began experiencing uncomfortable and fatal symptoms. You’re a Centers for Disease Control and Prevention (CDC) epidemiologist - someone who studies and analyzes effects of health and diseases. Your team has been tasked with understanding and containing this new infectious disease. After time, the disease began to mutate and is now transmittable between humans. Your team’s goal is to come up with a plan prevent, contain, or cure the disease. This unit helps students understand the spread of germs and how it affects our health through the application of computer modeling and simulation (agent based modeling).

**Students will brainstorm possible solutions for the problem statement to contain, prevent or cure and to test their model**

**Learning objectives:** Students will conduct sufficient background information about the history of diseases, identify several well known diseases (epidemic & pandemics) by name and define virus, bacteria.

The key research questions to be answered:

* *How do diseases spread?*
* *How are diseases contained, prevented or cured?*

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

What standards (content and practices) are you addressing in this unit/lesson(s)?

NGSS S8. Obtaining, evaluating, and communicating information

E2 Common Core ELA Practices They build strong content knowledge

[CCSS.ELA-LITERACY.RI.8.9](http://www.corestandards.org/ELA-Literacy/RI/8/9/)

Analyze a case in which two or more texts provide conflicting information on the same topic and identify where the texts disagree on matters of fact or interpretation

**Materials:**

* Access to online [Infectious Disease Research Resources](https://drive.google.com/open?id=1IEX9ZDrjnUQnhTuy_W2fJRjXgnXq_hbeIygas2Jym8I)
* [Research Notes](https://drive.google.com/open?id=1dRsQPo7of-TbARdVW6K-uZeDkAoMKxhP6ep1FuXba9U) (class copies)
* [Research Notes example](https://drive.google.com/open?id=10g-aPUQUkQUjKJjVHVibYCqmBH9759IVhOuXbE1nX3Q) (optional- for display)
* Student computers (class set)
* Headphones
* Teacher computer and projector

**Lesson preparation:**

* Ensure access to online reference materials for students: [Infectious Disease Research Resources](https://drive.google.com/open?id=1IEX9ZDrjnUQnhTuy_W2fJRjXgnXq_hbeIygas2Jym8I).
* Copy [Research Notes](https://drive.google.com/open?id=1dRsQPo7of-TbARdVW6K-uZeDkAoMKxhP6ep1FuXba9U) (class copies)
* Elect to show [Research Notes example](https://drive.google.com/open?id=10g-aPUQUkQUjKJjVHVibYCqmBH9759IVhOuXbE1nX3Q) (optional- for display)
* secure/distribute Student computers (class set)
* secure/distribute headphones to each student
* Teacher computer and projector
* Determine if optional videos/podcast to “hook Students” will be shown:
  + [Powers of Ten Video](https://youtu.be/0fKBhvDjuy0) (exponents- video examines the relative size of things: zooms in to micro level (inside human body viruses, etc.)l and out to solar system by adding power of 10. 1977 Cool)
  + New, HD version of something similar, but not as informative: [Cosmic Eye](https://youtu.be/jfSNxVqprvM) (zoom in zoom out- newer, but not narrated
  + [NPR Podcast](http://www.npr.org/sections/goatsandsoda/2017/02/14/511227050/why-killer-viruses-are-on-the-rise): Why Killer Viruses on Are the Rise (8:17)

**Time required:** 2 class period (50 minutes each)

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| **Time** | **Teacher** | **Student** |
| 5-8 min | Deliver “Hook” to students (optional) See above. | Students listen to podcast or watch one of the two videos. |
| 2 minutes | Remind students: “You’re a Centers for Disease Control and Prevention (CDC) epidemiologist - someone who studies and analyzes effects of health and diseases. Your team has been tasked with understanding and containing this new infectious disease. First you’ll need to research the history of diseases, learn about pathogens and determine what type you may be dealing with in this recent outbreak that coincided with the release of the new social media app so you can determine how to isolate, contain and hopeful cure people infected with the disease.”  A variety of resources have been provided for you to gather background information about the history of disease and basic biology about diseases, what causes them, how they are prevented,spread, contained and cured. |  |
| 3 minutes | Distribute worksheet [Research Notes](https://drive.google.com/open?id=1dRsQPo7of-TbARdVW6K-uZeDkAoMKxhP6ep1FuXba9U) (class copies) and direct students to online resources ([Infectious Disease Research Resources](https://drive.google.com/open?id=1IEX9ZDrjnUQnhTuy_W2fJRjXgnXq_hbeIygas2Jym8I).). There are a menu of resources for them to choose from to complete the worksheet.Show [Research Notes](https://docs.google.com/document/d/1w6UT4spI3Tf3VgtLlUUkvZCkfNB4RVo4ZPBMJFYC7wM/edit?usp=sharing) example (optional- for display) for an idea of what notes should look like. |  |
| 60 min | Monitor and assist as student complete worksheet | Students work independently on worksheet |
| 10 minutes | **Note Exchange: Determining Key Facts by Compiling Information**  In groups of 4 have students share items from their bulleted lists on “Background Information”. If the information appears on another student’s paper in the group it should be highlighted. Those without the information should add it |  |

**Grouping of students for instruction:**

Students will work individually on the research portion of this lesson, self selecting the resources that are most appealing to them.

**What is the instruction? Consider the PBL Procedure that is being addressed here:** See the PBL procedure on page 2. Are the students understanding, exploring, or resolving the problem? Or, are they doing all 3 in this lesson? Explain what the teacher is doing and what the students are doing. This section should be written as if you were writing very detailed substitute plans. Teachers should be able to teach this lesson from all the information you provide without having to ask the author questions

**Explore the Problem**

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| --- | --- | --- |
| **Time** | **Teacher** | **Student** |
|  | Introduce the research assignment and Essential Questions   * Need to pick two resources for the section on history (one reading and one video) * [Show Resource Matrix](https://docs.google.com/document/d/1IEX9ZDrjnUQnhTuy_W2fJRjXgnXq_hbeIygas2Jym8I/edit?usp=sharing) and [Notes Organizer](https://docs.google.com/document/d/1dRsQPo7of-TbARdVW6K-uZeDkAoMKxhP6ep1FuXba9U/edit?usp=sharing)   Essential Questions:   1. How do diseases spread? 2. How are they contained, cured, prevented?   Show an example |  |
|  | Facilitate Student Research   * Help guide students to find main ideas and key details in their research | Research and fill out Infectious Diseases Notes |

**Accommodations:** Describe special accommodations for any students with significant exceptional needs (i.e. visual impairment, deafness, physical impairments, etc.) Consider special groups like ELL, SPED, and Highly Capable when possible.

**Extensions:** Describe possible ways to extend the lessons, if time allows.

**Assessment:**

How will you assess student learning during the problem? Will there be a final product? Will the final product criteria be clear for students from the beginning? Will there be both whole group elements and individual accountability? Attach appropriate rubrics

Formative Assessment in the Lessons

Summative Assessment for the Unit

**Resources used for the whole unit can be captured at the end. Resources used only in one lesson should be noted individually for that lesson plan and at the end**.

**References/Resources:**

Attach any materials students will use during the lesson; e.g., handouts, questions to answer, and worksheets.Acknowledge your sources. Give credit to the person who created the idea for the instructional plan, including yourself. You might use language such as "Instructional Plan adapted from \_\_\_\_\_”; “Instructional Plan Consultants (not responsible for the content of this instructional plan): \_\_\_\_\_\_\_”; and/or “Instructional Plan Created by \_\_\_\_\_” Cite scripted materials/curriculum if appropriate.