Lesson Author(s)	Katelyn Carew
Lesson Title	Global Spread of Disease
Lesson Source	
Technology Needs (if any)	Projector connected to computer with internet (to show a video clip) The game Plague Inc. available to all the students (either on iPad or online)
Date/Time Lesson to be Taught	
School	
Supervising Teacher	
Math or Science?	Science
Lesson Concepts	How does disease spread on a global scale? What are some factors that allow the disease to spread across the world?
Objectives	Students will be able to discuss what factors cause a disease to spread on a global scale and make predictions on how to prevent the spread of deadly diseases.
CO State Standards	Eighth grade science "Human activities can deliberately or inadvertently alter ecosystems and their resiliency" and "Organisms reproduce and transmit genetic information (genes) to offspring, which influences individuals' traits in the next generation"
Materials List and Advanced Preparation	Projector & computer to show the video https://www.youtube.com/watch?v=mv25TQibN8g Plaque Inc. the game (online or app)
Safety	General classroom management (kids may get rowdy playing the game)
Accommodations for Learners with Special Needs	For students who cannot play the game because of seeing difficulties or poor motor skills, the teacher or a fellow student can pair up with them and work collaboratively in winning the game This game is for kinesthetic, visual, and logical learners For the audio learners, the teacher will start out by strategizing gameplay out loud to the rest of class (addressing key factors pertinent to the objective)

	For students with ADHD, this game keeps them engaged by showing relevancy to their lives and providing a different perspective when thinking about the spread of disease through a fun and interactive game

1. ENGAGEMENT		**Time: Minutes 5**
What the Teacher Will Do	**Probing/Eliciting Questions**	**Student Responses and Misconceptions**
• Show the video https://www.youtube.com/watch?v=mv25TQibN8g • Video prompt: "What is the problem with the methods used in this video?"	• What is the issue with collecting the dead like that? Besides the demeaning comparison to trash -- sanitation issues…	none at this point in the lesson.
Evaluation/Decision Point Assessment		**Student Outcomes**
make sure they are engaged and thinking about disease spread in regards to sanitation.		Engagement.

2. EXPLORATION		Time: Minutes 30
What the Teacher Will Do	**Probing/Eliciting Questions**	**Student Responses and Misconceptions**
• Teacher will administer the game to all the students either by passing out the iPads or assigning them to computers (whichever's available). • Students will play Plague Inc. independently but are encouraged to discuss game play with other classmates. • In the game, students play a microbial disease of their choice and the goal is to eradicate the human race by strategically infecting the right region and mutating into a more infections and drug resistant disease. • Teacher will start out by showing the students how to play on the projector/doc cam (whichever is more convenient) and introduce important factors to consider. • As the game progresses, students will become more independent and the teacher can begin to walk around and monitor the progress of students.	What do you think is going to be more deadly: bacteria, fungi, virus, or protozoa? Why do viruses in the game get more mutations without spending DNA points? Where would be the most strategic place to infect first? What factors make you think so? (Tourism, population density, heavily traveled area, emigration, immigration, major cities, poor health care, etc.) What mutations will make the disease more infectious (without looking at the DNA points)? Why? What vectors will help the disease spread across seas? What vectors are hard to exterminate or keep away? Why? Why is drug resistance worth so many DNA points? Why do you think you lost? Won?	Students getting distracted with gaining DNA points and losing the objecting of why they are gaining DNA points.
Evaluation/Decision Point Assessment		**Student Outcomes**
Students engaged in winning or losing the game but more importantly explaining why they won or lost.		Playing the game.

3. EXPLANATION		Time: Minutes 5-10
What the Teacher Will Do	**Probing/Eliciting Questions**	**Student Responses and Misconceptions**
• Teacher will collect iPads/students will return to their seats (away from the distraction of the game). • Students will call out important factors that allowed their disease to spread and teacher will write this list on the board. • Class will discuss a few of these and a few other facets that help the spread of disease.	What helped you win the game? What made you lose? What factors cause disease to spread quicker or more effectively? Can you think of any major diseases now that are spreading in this way and becoming a world epidemic? How do they spread? How do you know? Why is the spread of disease faster in more populated cities? Why is it harder to infect isolated populations like Madagascar?	Tying in both geographical trends and genetic trends of the disease is a challenging connection for students to make.
Evaluation/Decision Point Assessment		**Student Outcomes**
Student responses and involvement in discussion		participation

4. ELABORATION		Time: Minutes 5-10
What the Teacher Will Do	**Probing/Eliciting Questions**	**Student Responses and Misconceptions**
• Teacher will pick one of the factors in this list • Class will discuss ways to prevent the spread of disease while focusing on this one factor • Teacher may provide examples of humans doing this in real life	What are some ways to prevent the spread of disease when considering (drug resistance, infectious symptoms, common vectors, populous cites, tourist cities, health care, etc.)? What have we done in the past to prevent further spread of an epidemic? What are we doing now? Have we improved? How do the health policies differ from country to country? When does the World Health Organization intervene?	Having trouble coming up with anything other than vaccines.
Evaluation/Decision Point Assessment		**Student Outcomes**
Critically thinking about ways to prevent the spread of disease on a global level.		Participation – make sure no one is lost at this point.

5. EVALUATION		Time: Minutes 10
What the Teacher Will Do	**Probing/Eliciting Questions**	**Student Responses and Misconceptions**
• Students will pick another factor in the list and give 2 or 3 ways on a notecard/exit ticket that prevents the spread of disease when only thinking about this factor.		

Differentiation	Time: N/A
Students who are behind or need support	For advanced or gifted students
-Extra attention and one-on-one time. -Addressing real world issues or even local issues like the spread of flu in school. -Connect it to their lives a bit more. -Make connections to gameplay throughout the discussion.	This lesson can be very advanced if the right questions are asked and multiple dimensions of the spread of disease are overlaid (social, biological, geographical, etc.).