

Unit 2 Living Earth

OBJECTIVES

Students will be able to:

Investigate different types of infectious diseases.

Discover what diseases affect the target audience.

Explore the role of a Community Outreach Campaign Team.

BACKGROUND

Over the past few decades, some major diseases, such as polio, the bubonic plague, and mumps, have been almost completely eradicated in many countries. This is due to understanding what causes infectious diseases and what actions can help eliminate them. Infectious diseases can spread throughout the world quickly and relentlessly. This means it is vital that we find ways to identify and treat these diseases. Children under the age of five are especially susceptible to infectious diseases.

Scientists work hard to study and find solutions to diseases. To do this, they have to have a firm understanding of how infectious diseases spread through populations and the pathogens that cause the diseases. Studying pathogens, variables that determine their spread, and ways to destroy them allows scientists to develop the vaccines and recommend procedures to prevent diseases to the public.

In 1796, Edward Jenner developed a vaccine for smallpox. Even after this important discovery, the importance of sanitation to prevent disease was not recognized until the late 1800s. At that time, many diseases were linked to drinking impure water and to unsanitary living conditions. Diseases including cholera, malaria, diarrhea, hepatitis A, and typhoid are common infectious diseases that result from unclean drinking water. There are still more than a billion people worldwide who lack clean drinking water and more than two billion who lack clean living conditions. Clean water is especially important in preventing diseases in children under five.

From a presence in research, to a lack of trust in medicine, to availability of vaccines and treatment, many people of color and other disadvantaged groups in the US and globally face inequity as they seek medical treatment for infectious disease.

Unit 2 Living Earth

PROJECT SUMMARY

Disease Education Report

Posts and Communication Created for the Disease Education Social Media Posts Slide Deck

Community outreach or health campaigns can have a powerful impact on awareness as they combine information and education with visual and audio elements to bring awareness and change to a community issue. The first steps in the creation of an outreach campaign is to understand the problem and identify the audience that is being impacted negatively. This project will focus on infectious disease and the inequality that some groups or populations face when seeking medical care and finding access to data and information about their own health.

You are part of a team that is tasked with creating a community outreach campaign to inform and influence people in a community that struggles with health literacy about an infectious disease they are facing. Your community outreach campaign should address issues related to disparities in healthcare and access to treatments or prevention associated with your disease. In your role as a project manager, community education specialist, web design specialist, or media specialist, you will choose a community profile and work with your group to research information about the challenges the community faces when dealing with disease and health-related issues. The group will create a community outreach campaign that will provide community members with education about infectious diseases, treatments, health care availability and data on disparities in health care for their community. An informative ad or

infographic, PSA video calling community members to action, a mock social media outreach, or other advertisements for communication will be added to the campaign website.

IMPORTANT NOTE: This project does not actually have students post directly to social media platforms due to the sensitivity around using social media in the classroom and the potential issues of having students create social media accounts for this project. Instead, students are creating posts for the social media platform they choose, but are not actually posting on the platform. Options will be suggested for ways to reach the target audience of their social media posts including:

- Teachers managing a class social media account for the students.
- Classes providing ideas and content to be shared on school social media platforms.
- Students share their social media posts directly to identified community leaders via email or other form of communication.

Proposal Requirements

Research for the project must include:

- Definition of different infectious diseases (viral, bacterial, parasitic).
- What conditions allow the disease to exist and persist within the identified community.
- 3 How the disease impacts the people in their community.
- 4 How the disease impacts the body, disrupts the homeostasis of the body system.
- 5 The social and emotional impact of the disease.
- 6 Data on prevalence of infectious disease in their community or region with a separation of various ethnic or socioeconomic groups (if available).
- 7 Information on where clinics and treatment might be available in the community or websites to get information about treatment options.

The Disease Education Report must include:

- 1 Disease Background
- 2 Disease Impact
- 3 Disease Causes
- 4 Disease Context (Conditions that give rise to the disease)
- 5 Disease Treatment

The posts and communications must include:

- 1 All portions of the mock social media profile completed in an appropriate and relevant way.
- 2 Informative postings, pictures, and comments that convey data and the message of the project to the target audience.
- 3 A clear topic and message that is conveyed in a graphic way.
- 4 Incorporation of data to support the topic or message from appropriate and credible sources.
- 5 Pictures or graphics to support the data.
- 6 Background information on inequity in healthcare in disadvantaged communities that helps to explain why this is an important issue related to human health.
- 7 A clear message for a specific target audience, which may include a slogan or catchphrase.
- 8 It should be engaging and appropriate for the target audience.

Project Design Process Journal	
Name	Team Members
Start Date	
Due Date	

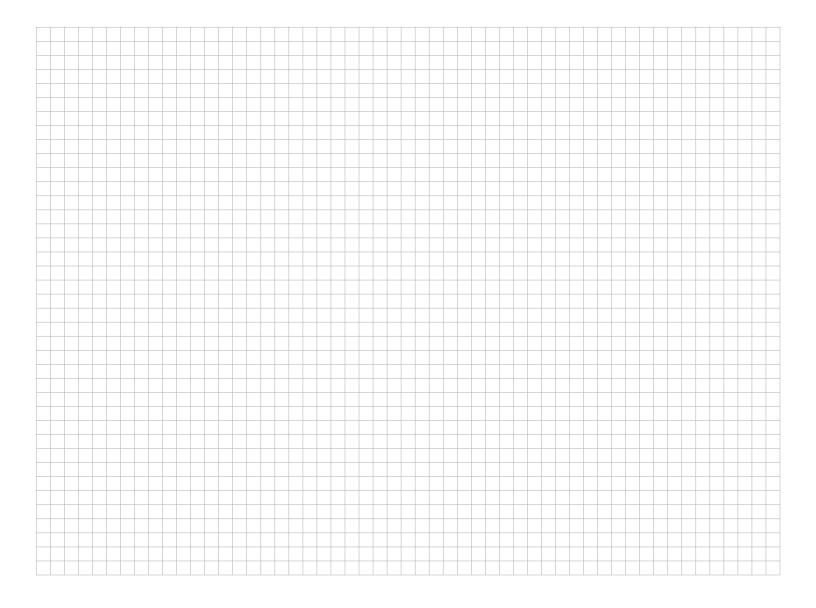
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Engineering Design Process Journal

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Step 2: Brainstorm

Discuss initial ideas for your campaign with your group. In the space provided, create a concept map, flow chart, or other type of graphic organizer showing how you might connect information about an infectious disease to the issues of health care inequity in your chosen community. What will the goal of each piece of the campaign be to inform and inspire?



in answering your questions?

Engineering Design Process Journal Step 2: Step 1: Define the Step 4: Step 5: Step 6: Step 7: Step 8: Step 9: Step 10: Step 11: Step 12: Brainstorm Research Identify Make a Model Test and Modify Communicate Explore Select an Develop Refine the Problem and Generate Criteria Possibilities the Design and Present Processes Approach or Prototype Evaluate Design Ideas and Specify Proposal Design Using for Market and Results Constraints Specifications Step 3: Research and Generate Ideas **Resource List** On the table below, think about possible questions you need to answer to gather more information prior to committing to one of your ideas. What resources are available to assist you

Possible Questions Generate a list of specific questions that need to be answered	Collected Information to Answer the Question	Any Additional Ideas Uncovered or Generated During Research Notes or sketches

Possible Question starters:

- What are some additional demographics or background that might be helpful to know about your chosen community?
- Has the problem of inequity in healthcare been addressed previously? If so, what was not effective or what allows the problem to continue?
- What will the target audience be for this campaign?
- What data resources might be helpful when creating the campaign?

Engineering Design Process Journal

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Lesson Connections

LESSON 1: Infectious Diseases

Use the capture sheets and information learned from this lesson to answer the following questions:

How has Covid-19 impacted our community?	
How can a community outreach campaign be used to combat diseases in a community?	
How do different types of infectious diseases impact our bodies and communities?	

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Lesson Connections

LESSON 2: Disease Transmission and Cause

Use the capture sheets and information learned from this lesson to answer the following questions:

How are the different causes of infectious diseases similar and different from one another regarding their transmission and effects on the body?
How is our body organized to make it work properly?
How do the various body systems work?
How do diseases impact the body system?

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Lesson Connections

LESSON 3: Disease Impact

Use the capture sheets and information learned from this lesson to answer the following questions:

How do you design an experiment around an experimental question?
How does the body maintain homeostasis?
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How does the process of mitosis help maintain homeostasis in the body?
How does infectious disease disrupt the homeostasis of an infected person's body?
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Lesson Connections

LESSON 6: Community Empowerment

Use the capture sheets and information learned from this lesson to answer the following questions:

How can the disease be eradicated from the community you are focused on helping?
How can you deliver a speech that helps convince people to follow a certain course of action?
How can you deliver a speech that helps convince people to follow a certain course of action?
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Step 1: Define the Problem	Step 2: Brainstorm	Step 3: Research and Generate Ideas	Step 4: Identify Criteria and Specify Constraints	Step 5: Explore Possibilities	Step 6: Select an Approach	Step 7: Develop the Design Proposal	Step 8: Make a Model or Prototype	Step 9: Test and Evaluate Design Using Specifications	Step 10: Refine the Design	Step 11: Modify and Present for Market	Step 12: Communica Processes and Results
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Engineering Design Process Journal

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F	Problem		and Generate	Criteria	Possibilities	Approach	the Design	or Prototype	Evaluate	Design	and Present	Processes
			Ideas	and Specify			Proposal		Design Using		for Market	and Results
				Constraints					Specifications			

Step 5: Explore Possibilities

Disease Education Report

Review your ideas from the Brainstorm and Research sections of your Design Journal. Explore some of your ideas with more detail. Record your exploration in the space below. Possible explorations can reflect testing, experiments, simulations, peer review, etc. Be sure to include any data collected or group discussion and feedback.

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Engineering Design Process Journal

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Define the	Brainstorm	Research	Identify	Explore	Select an	Develop	Make a Model	Test and	Refine the	Modify	Communicate
Problem		and Generate	Criteria	Possibilities	Approach	the Design	or Prototype	Evaluate	Design	and Present	Processes
		Ideas	and Specify			Proposal		Design Using		for Market	and Results
			Constraints					Specifications			

Step 6: Select and Approach

Use the following decision matrix to assist you in selecting one of your ideas for further development. To use the tool, complete the following steps:

- 1 Enter the criteria and constraints of the project you recorded earlier in the first column.
- 2 Use a numeric value to rate each solution against the criteria or constraint. (2 = totally meets the requirement, 1 = somewhat meets the requirement, 0 = does not meet the requirement)
- 3 Total the columns and circle the highest score.

Criteria or Constraint	Sketch/Idea 1	Sketch/Idea 2	Sketch/Idea 3
Other criteria: A single rating for your own "nice-to-have," desirable criteria and universal design criteria (such as Robustness, Aesthetics, Cost and Resources, Time, Skill Required, Safety):			
Totals			

Engineering	; Design Pro	cess Journal									
Step 1: Define the Problem	Step 2: Brainstorm	Step 3: Research and Generate Ideas	Step 4: Identify Criteria and Specify Constraints	Step 5: Explore Possibilities	Step 6: Select an Approach	Step 7: Develop the Design Proposal	Step 8: Make a Model or Prototype	Step 9: Test and Evaluate Design Using Specifications	Step 10: Refine the Design	Step 11: Modify and Present for Market	Step 12: Communicate Processes and Results
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Engineering Design Process Journal

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Define the	Brainstorm	Research	Identify	Explore	Select an	Develop	Make a Model	Test and	Refine the	Modify	Communicate
Problem		and Generate	Criteria	Possibilities	Approach	the Design	or Prototype	Evaluate	Design	and Present	Processes
		Ideas	and Specify			Proposal		Design Using		for Market	and Results
			Constraints					Specifications			

Step 8: Campaign Design

In the space below, create a storyboard of your effective pitch from Lesson 6. Use your Disease Education Report and Community Communication Posts to communicate how to eliminate the infectious disease in the target community.

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Step 1: Define the Problem	Step 2: Brainstorm	Step 3: Research and Generate Ideas	Step 4: Identify Criteria and Specify Constraints	Step 5: Explore Possibilities	Step 6: Select an Approach	Step 7: Develop the Design Proposal	Step 8: Make a Model or Prototype	Step 9: Test and Evaluate Design Using Specifications		Step 11: Modify and Present for Market	Step 12: Communicat Processes and Results
Step 10:	Refine the	Design									
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Engineering Design Process Journal

Step 1:	Step 2:	Step 3:	Step 4:	Step 5:	Step 6:	Step 7:	Step 8:	Step 9:	Step 10:	Step 11:	Step 12:
Define the	Brainstorm	Research	Identify	Explore	Select an	Develop	Make a Model	Test and	Refine the	Modify	Communicate
Problem		and Generate	Criteria	Possibilities	Approach	the Design	or Prototype	Evaluate	Design	and Present	Processes
		Ideas	and Specify			Proposal		Design Using		for Market	and Results
			Constraints					Specifications			

Step 11: Modify and Present

What changes (if any) did you make to your campaign after data and feedback in the Evaluation step of this project?

Presentation of the Product

The community outreach campaign platform (website) must include:

- 1 An education section that will inform community members about the science of treatment for infectious diseases, the production of vaccines, and data on the inequity the community faces.
- 2 An ad or infographic that will inform the community about the problem with inequity in medicine.
- A PSA video that will call for action from the community members to demand equity and equality in healthcare.

- 4 A mock social media profile that can show outreach and a method for communication of information for the community.
- 5 Features that are targeted to your specific audience. (For example, if your target audience is non-english speaking, it may be helpful to add pages that are translated in that language or record a second PSA video with a voiceover in the native language of that group.)

Explain in the space below, if this were for an actual community outreach campaign challenge (rather than a fictional one) what further work would need to be done to prepare the campaign for actual implementation in the community?

Engineerin	g Design Pro	cess Journal									
Step 1: Define the Problem	Step 2: Brainstorm	Step 3: Research and Generate Ideas	Step 4: Identify Criteria and Specify Constraints	Step 5: Explore Possibilities	Step 6: Select an Approach	Step 7: Develop the Design Proposal	Step 8: Make a Model or Prototype	Step 9: Test and Evaluate Design Using Specifications	Step 10: Refine the Design	Step 11: Modify and Present for Market	Step 12: Communicate Processes and Results
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