

Episode 3 Lesson Plan: Power of Germs

This lesson is designed for students studying biology/life science, world history, geography, current events, and ethics in grades 6-12.

- Lesson Objectives
- Relevant National Standards
- Estimated Time
- Materials Needed
- Backgrounder for Teachers
- Assumed Student Prior Knowledge
- Teaching Strategy
- Assessment Suggestions
- Extension Ideas
- Related Resources
- About the Author

Lesson Objectives:

Students will be able to:

1. Discuss the role that disease has played historically and in the present day in the shaping and developing of wealth around the world.
2. Use listening and note taking skills to view the film segment and complete the accompanying viewing guide accurately.
3. Utilize a number of primary sources to conduct research about the role of disease in the historical and ongoing development of the world's nations.
4. Work in pairs/small groups to complete a project and presentation illustrating the role of disease in the world and how germs can stall/kill a country's chance at wealth and power.
5. Make a group presentation to teach classmates about what they learned about the germs and disease and impact of these things on the technological and economic development of countries.

Relevant National Standards:

World History

Standard 27: Understands how European society experienced political, economic, and cultural transformation in the age of global intercommunication between 1450 and 1750.

Standard 29: Understands the economic, political, and cultural interrelations among peoples of Africa, Europe, and the Americas between 1500 and 1750.

Geography

Human Systems

Standard 9: Understands the nature, distribution, and migration of human populations on Earth's surface

Standard 12: Understands the patterns of human settlement and their causes

Uses of Geography

Standard 17: Understands how geography is used to interpret the past

Science

Life Sciences

Standard 4: Understands the principles of heredity and related concepts

Standard 6: Understands relationships among organisms and their physical environment
Standard 7: Understands biological evolution and the diversity of life

Language Arts

Writing:

Standard 4: Gathers and uses information for research purposes

Reading:

Standard 7: Uses reading skills and strategies to understand a variety of information texts.

Listening and Speaking:

Standard 8: Uses listening and speaking strategies for different purposes

Viewing:

Standard 9: Uses viewing skills and strategies to understand and interpret visual media.

Thinking and Reasoning:

Standard 1: Understands and applies the basic principles of presenting an argument

Standard 5: Applies basic trouble-shooting and problem-solving techniques

Standard 6: Applies decision-making techniques

Working With Others

Standard 1: Contributes to the overall effort of the group

Standard 4: Displays effective interpersonal communication skills

Estimated Time:

Approximately 2 to 3 90-minute and 4 to 5 45-minute class periods

Materials Needed:

- Internet access to allow for viewing of companion website's "The Story of..." Smallpox and Malaria writing features and conducting research
- Television/vcr for viewing "Guns, Germs, and Steel: Episode 3" content
- Viewing Guide handout for each student (printable copy provided with lesson plan)
- Library/primary resources for conducting research
- Project Guide for each student (printable copy provided with lesson plan)
- Assorted art supplies including poster board, construction paper, markers, glue, colored pencils, and stencils for creating projects and presentations illustrating the power of germs.

Backgrounder for Teachers:

Teachers will need to look at the role that germs played in the historic conquests of the world as well as how the spread of these same diseases today is keeping many of the world's poorest countries from developing. The economic, social, and technological impact of the spread of germs and disease and how this part of Diamond's theory remains true even today will be explored in this lesson.

Assumed Student Prior Knowledge

For this lesson, students need to understand Diamond's theories related to geographic luck and how this luck allows some countries to grow and conquer while others develop at a much slower pace. Students will need to understand the words epidemic and endemic.

Teaching Strategy:

Part 1: The Power of Germs

1. Create student interest in the lesson by asking students to answer the following questions on a piece of scratch paper.

- Most deaths in children under age 5 are due to:
 - A. infectious diseases and malnutrition
 - B. premature birth/birth defects
 - C. accidents

***Answer: A (over 5 million each year die from diseases such as pneumonia and diarrhea combined with malnutrition—mostly in developing countries)**

- True or False: At least 40% of the deaths in children under age 5 that occur worldwide each year could be prevented by administering existing vaccines to young children.

***Answer: True Of the 5 million + children under five who die each year, 2 million deaths could be prevented by administering existing vaccines and most of the rest would be preventable by other means (i.e. good nutrition, hygiene, clean water, etc.)**

- List what you believe are the 5 most deadly infectious diseases worldwide.

***Answer: Acute Lower Respiratory Infections/Pneumonia (3.7 million), Tuberculosis (2.9 million), Diarrhea (2.5 million), HIV/AIDS (2.3 million), and Malaria (1.5-2.7 million)**

***Source: World Health Organization “50 Facts: Global Health Situation and Trends 1955-2025”**

2. Once students have answered each question, facilitate a class discussion and provide students with the correct answers to each question. In the discussion, pose questions such as:

- Were you surprised by the answers to any of the questions? If so, which ones, and why?
- As a person living in the U.S., would you expect to suffer from the infectious diseases that are the top killers worldwide? Why?
- In an age where so much medical technology is available, particularly in the form of medications and vaccines, why do you think so many people are still dying from preventable diseases?
- How does it make you feel when you think about people in developing countries dying from these types of diseases at alarmingly high rates?
- Who should be responsible for helping to eradicate these diseases? Why?

3. Focus student attention on the content of “Guns, Germs, and Steel” by reminding students about the question that started Jared Diamond’s research: **Why do some societies have so much while others have so little?** Remind students of Diamond’s theory that **geography** determines which societies flourish and grow and which are conquered and lag behind in the development of technology, power, and wealth. At the heart of this theory is the idea that guns, germs, and steel ultimately gave some groups advantages over others. Direct students to the “The World” feature at <http://www.pbs.org/gunsgermsteel/world/index.html> to review and document the statistics about disease and poverty rates in the countries described when each portion of the map is engaged.

4. Distribute the **Viewing Guide** to students. Take time to read over the questions before viewing “Guns, Germs, and Steel: Episode 3”. If there are time limits on the amount of

viewing that can take place, excerpt the episode and view the following segments:

- Beginning of episode to 6:50 (explains European settlement in Africa)
- 8:26 to 10:01 (introduction of European diseases to Africa)
- 33:50 to 40:53 (describes the effects of diseases native to the tropics on European settlers)
- 42:39 to 48:01 (describes how malaria, to which many Africans once had immunity, is now an endemic and the number one health problem in Africa because of the physiological and cultural changes the country has experienced over the last 100 years)
- 50:37 to 52:32 (discusses how other tropical countries have become rich and powerful by addressing the problems that geography and germs caused and eradicating them in order to gain wealth and power in the world)

5. Once students have viewed the film, have them learn more about Smallpox and Malaria and how these diseases effected the development of world powers. Have students access this information at <http://www.pbs.org/gunsgermsteel/variables/smallpox.html> and <http://www.pbs.org/gunsgermsteel/variables/malaria.html> and answer questions 11-12 on the **Viewing Guide**.
6. After students have completed the **Viewing Guide**, take time to discuss each question, referring back to the film or the companion website materials as needed. Encourage students to add to their answers so they can use this information as they complete the projects in Part 2 of the lesson.

Part 2: Combating Germs Worldwide

1. Students have learned about and discussed the role of germs in the development of nations throughout the world. Using what they have learned from viewing the film, reading the content from the companion website, and class discussions, have students work in pairs or small groups to create a project related to what they have learned about the impact germs have on the development of a society/country. Using the **Project Guide**, direct students as they complete one of the projects described and prepare to present it to the class.
2. Provide students with classroom time to conduct research and create their projects. Monitor students frequently to ensure they are completing the project according to the established guidelines.
3. When projects are completed, provide each pair/group with class time to present what they have learned and developed to the rest of the class.
4. When all projects have been completed, provide an area in the classroom for students to display their work.

Assessment Suggestions:

1. Students could receive participation scores/grades for answering and discussing the infectious disease questions, participating in class discussion and debate, and completion of group research for project presentation.
2. Students could receive completion or accuracy grades for their work on the Viewing Guides.
3. Students could complete peer evaluations and self evaluation or be graded using a scoring guide for completion of the project and the accompanying presentation.

Extension Ideas:

1. Have students write letters to the editor of to their congressional representatives stating their opinions about what should be done in the U.S. to help developing countries fight preventable

For more GUNS, GERMS, AND STEEL lesson plans...go to: www.pbs.org/gunsgermsteel/

diseases and save people, many of them children, from dying from diseases that have been eradicated or are easily preventable in technologically advanced and wealthier countries.

2. Conduct a classroom debate about the U.S. and groups such as the World Health Organization should be doing to increase awareness about diseases such as HIV/AIDS and tuberculosis and to fight the spread of these diseases on a global level.

Related Resources:

“**Guns, Germs, and Steel**” website sections entitled:

“The World” feature available at <http://www.pbs.org/gunsgermsteel/world/index.html> illustrates the disease and poverty rates in many different regions of the world

Variables (“The story of...” Smallpox and Malaria features content about each of the diseases and their historical significance and can be found <http://www.pbs.org/gunsgermsteel/variables/index.html>

World Health Organization

http://www.who.int/whr/1998/media_centre/50facts/en/

provides detailed information about global health trends from 1955 and projected into 2025.

National Institute of Allergy and Infectious Disease

<http://www.niaid.nih.gov/final/immun/immun.htm>

provides a step-by-step look at how the body’s immune system works to fight disease and produce antibodies

National Library of Medicine

<http://sis.nlm.nih.gov/Tox/biologicalwarfare.htm>

provides information about the possible agents and effects of biological warfare

About the Author

Lisa Prososki is an independent educational consultant who taught middle school and high school social studies, English, reading, and technology courses for twelve years. Prososki has worked with PBS TeacherSource and has authored many lesson plans for various PBS programs over the past five years. In addition to conducting workshops for teachers at various state and national conventions, Prososki has also worked as an editor and authored one book.