

The *Pathogens and Disease CPU* introduces students to disease-causing agents and epidemiology. Students culture bacteria and fungi and use a microscope to examine and classify the microorganisms they grow. Students explore diseases such as smallpox, rabies, and AIDS to better understand the effect of pathogens and disease on the population at large.

Through a simulated disease outbreak, students perform the necessary procedures to identify and contain an epidemic. Activities include culturing and identifying bacteria and fungi, analyzing data such as patient interviews and questionnaires, creating an epidemic curve, and calculating attack rate and relative risk for various exposures.



Areas Covered

- ◆ Germ theory
- ◆ Overview of the immune system
- ◆ Collection and examination of contaminated water
- ◆ Bacteria, viruses, and fungi
- ◆ Bioterrorism and the CDC category A agents
- ◆ Descriptive epidemiology, including:
 - Graphing and interpreting an epidemic curve
 - Creating and analyzing a spot map
 - Analyzing populations affected
- ◆ Analytic epidemiology, including:
 - Performing cohort studies and calculating attack rates
 - Performing case-control studies and calculating relative risk
- ◆ Disease prevention techniques, including:
 - Quarantine
 - Variolation, inoculation, and vaccination
 - Aseptic technique
 - Skills and knowledge to aid students in various HOSA competitions



Career Pathway Unit Includes:

Pathogens and Disease CD and Instructor's Overview Booklet, Bacteria CD, Butane Burner, Incubating Microorganisms Textbook, Skills Cart™, Microbe Scavenger Hunt Lab, Microscope, Pathophysiology for the Health Profession Textbook, Protista and Fungi, Viruses CD

Pathogens & Disease Goals & Activities

- Investigate the evolution of germ theory.
- Explore careers related to pathogens and disease.
- Define terms related to epidemiology.
- Determine the initial steps of an epidemic investigation.
- Conduct research on *E. coli* bacteria in preparation for a simulated epidemic.
- Determine whether an actual outbreak is occurring in an epidemic scenario by creating a graph to track cases.
- Determine appropriate surveillance methods for tracking a simulated *E. coli* epidemic and when each is appropriate to use.
- Create an epidemic curve for a simulated *E. coli* epidemic.
- Create a spot map for a simulated *E. coli* epidemic.
- Create a personal characteristics summary for the patients involved in the simulated *E. coli* epidemic.
- Create a hypothesis for the origin of the simulated *E. coli* epidemic.
- Analyze data obtained for cohort and case-control studies conducted for the simulated *E. coli* epidemic to determine attack rates and relative risk.
- Review basic microbiology.
- Prepare slides for examination.
- Use the microscope to examine microbes in the untreated water samples.
- Create a report describing the type and number of microbes in each water sample and contrasting the samples.
- Culture bacteria and fungi from multiple areas.
- Review patient questionnaires for information pertinent to a simulated *E. coli* outbreak.
- Analyze data to identify which patients require further testing or other follow-up in a simulated outbreak scenario.
- Explore fungi and mycoses.
- Observe a multimedia presentation on mold.
- Collect and examine bacterial and fungal cultures for growth.
- Examine the common cold and determine why a cure for the common cold is unlikely.
- Explore both human viruses and bacteriophages.
- Identify several of the diseases for which vaccinations are available.
- Discover the history of AIDS both in this country and worldwide.
- Observe presentations on the causes, prevention, and effects of HIV/AIDS.
- Examine AIDS as an example of immunodeficiency.
- Examine diseases caused by protists.
- Determine how descriptive epidemiology is used during an outbreak.
- Examine the general shape, color, and structure of the bacterial colonies.
- Stain slides of the bacteria grown in the cultures.
- Examine the general shape, color, and structure of the fungal colonies.
- Create, examine, and identify fungal slides.
- Determine how analytic epidemiology is used in an epidemic scenario.
- Determine how to calculate attack rates for exposed and unexposed individuals in a cohort study.
- Determine how to calculate relative risk for a given exposure in a case-control study.
- Examine the CDC Category A disease agents.



Ronald A. Williams, Ltd.
1703 N. Parham Rd.
Suite 120
Richmond, VA 23229
800-752-6968
804-282-8239
804-282-4087 FAX
www.rawledu.com
info@rawledu.com