

Case Details

Case Title:

Sick!

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Grade Level(s):

Middle School

Subject(s):

Life Science

Summary:

A young woman is suddenly stricken with gastro-intestinal distress and fatigue, and as time goes on she realizes she's not the only one. Is this a simple case of food poisoning, or a full-blown outbreak?

Suggested Citation:

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Learning Objectives:

1. Identify the organs of the digestive tract and describe and what each organ does.
2. Define diarrhea and list common causes. Distinguish between pathogenic and nonpathogenic causes of diarrhea.
3. Explain how diarrhea and dehydration are related. Discuss how this connection relates to the medical advice given for managing / treating diarrhea.
4. Define the following terms: pathogen, infection, outbreak, parasitic disease, food poisoning, sanitation.
5. Identify common diarrhea-causing water-borne pathogens in the U.S. and how people typically get infected.
6. Identify common pathogens that cause food poisoning in the U.S. and how people typically get infected.
7. List general recommendations to prevent food poisoning and waterborne diseases. Evaluate the effectiveness of these recommendations.
8. Properly use a microscope to identify organisms in a water sample.

9. Correctly identify organisms in a water sample (pond protests) using a taxonomic key.
10. Research specific organisms and make judgments about the ability of the organisms to be pathogenic.
11. Characterize members of the protist kingdom (plant-like vs. animal like), methods of locomotion, reproduction, and obtaining / using energy.
12. Work together to generate hypotheses and learning issues.
13. Distinguish between data, hypothesis, questions relevant to the case and learning issues.
14. Research learning issues using a variety of appropriate references.
15. Report research findings in a clear and organized manner.
16. Create and follow rules for working on the case as a group.
17. Evaluate the effectiveness of the group (and themselves) in working through the case, researching the learning issues, and learning about the different issues that came up during the course of the case.

National/State Standards:

Georgia Performance Standards

SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science. (NSES Content Standard A, G).

- b. Recognize that different explanations often can be given for the same evidence.
- c. Explain that further understanding of scientific problems relies on the design and execution of new experiments which may reinforce or weaken opposing explanations

SCSh6. Students will communicate scientific investigations and information clearly. (NSES Content Standard G)

- d. Participate in group discussions of scientific investigation and current scientific issues

SCSh8. Students will understand important features of the process of scientific inquiry. (NSES Content Standard A, G)

- c. Scientists use practices such as peer review and publication to reinforce the integrity of scientific activity and reporting.
- e. The ultimate goal of science is to develop an understanding of the natural universe which is free of biases.
- f. Science disciplines and traditions differ from one another in what is studied, techniques used, and outcomes sought.

SCSh9. Students will enhance reading in all curriculum areas by:

- a. Reading in all curriculum areas
- c. Building vocabulary knowledge
- d. Establishing context.

S7L1. Students will investigate the diversity of living organisms and how they can be compared scientifically. (NSES Content Standard C)

- a. Demonstrate the process for the development of a dichotomous key.
- b. Classify organisms based on physical characteristics using a dichotomous key of the six kingdom system (archaebacteria, eubacteria, protists, fungi, plants, and animals).

S7L2. Students will describe the structure and function of cells, tissues, organs, and organ systems. (NSES Content Standard C)

- a. Explain that cells take in nutrients in order to grow and divide and to make needed materials.
- b. Relate cell structures (cell membrane, nucleus, cytoplasm, chloroplasts, mitochondria) to basic cell functions.
- c. Explain that cells are organized into tissues, tissues into organs, organs into systems, and systems into organisms.
- d. Explain that tissues, organs, and organ systems serve the needs cells have for oxygen, food, and waste removal.
- e. Explain the purpose of the major organ systems in the human body (i.e., digestion, respiration, reproduction, circulation, excretion, movement, control, and coordination, and for protection from disease).

National Science Education Standards (NSES), Content Standard F: As a result of activities in grades 9-12, all students should develop understanding of Personal and community health, Natural and human-induced hazards, Science and technology in local, national, and global challenges