



Bad Bacteria

CONTENT STANDARD: Life Science

CONTENT TOPIC: Bad Bacteria

CONCEPT: Bacteria are essential to life.

CONTENT OBJECTIVE: To identify and learn about bad bacteria

INSTRUCTIONAL OBJECTIVES: The learner will:

- define bacteria.
- list and observe the characteristics of bacteria.
- research the distribution of microorganisms.

OUTLINE OF CONTENT:

- I. Define bacteria
- II. Characteristics of bacteria
- III. Harmful bacteria
- IV. Research growing cultures

GOAL: To enable students to demonstrate the process of science by posing questions and investigating phenomena through language, methods and instruments of science

THEME: Observing and Explaining- The senses are used to develop an awareness of an event or object and the properties thereof.

STANDARD(S): The learner will understand that:

The human senses and technological instruments are used to gather information from the environment.

BENCHMARK Information is gathered by using human senses and various instruments such as magnifying lenses, microscopes, telescopes, thermometers, scales, and balances.

CLASSROOM CONNECTORS

TIME REQUIRED: 30 minutes

MATERIALS: Cultures, magnifying lenses and microscopes. *The cultures will need to be grown prior to QUEST Day.* It is a good idea to use 4th and 5th grade classes to help in growing these cultures two weeks prior to QUEST Day.

SET:

(Show a book with small print.) What can I use to help make this easier to see? Tell your neighbor. (magnifying glass). That's right! A magnifying glass will make objects appear larger. What would you use to magnify something that's even smaller? (a microscope). Today you will use a microscope that will magnify a culture from different sources 100x (or check the magnification degree of your microscope).

Kinder and 1st grade:

- Bacteria are tiny living things we can only see with a microscope
- We call bad bacteria “germs”. Germs can make you sick.
- That is why it is so important to wash your hands often, especially after playing outside or when you feel sick.

2nd-5th grades:

Today we have some cultures of some microscopic organisms of bacteria and other microorganisms. Bacteria live in or on 99.9% of all living things including the air, water, soil, plants and animals. You each have more bacteria on your body than there are people on the planet Earth.

I want you to observe the cultures and make a picture or drawing of the different organisms. We want to observe and discuss how microorganisms live. We don't expect you to be able to practice medicine after this lesson, but hopefully you will better understand the importance of covering your sneezes and coughs with a tissue or handkerchief in order to avoid the spread of viral germs and also remember the need to keep your hands clean!

INSTRUCTION:

Some bacteria are helpful and some are harmful. We are going to talk about some harmful bacteria. Bacteria are one kind of microorganism. Bacteria are tiny living cells that can only be seen through a microscope. Under the microscope we will look at some cultures made by 4th and 5th grades. (Pass around and compare the cultures) Like all other bacteria, the animal-like bacteria are made of only one cell and have GENETIC Material (DNA) floating inside.

There are many different kinds of animal-like microorganisms. Most of the animal-like microorganisms have some special way of moving about. The ameba is one of the animal-like microorganisms that move by changing its shape. Did you see anything like that? Microorganisms need a food supply. This is usually other living organisms. Whatever the microorganism is feeding on is called the *host*. The host organism can become sick because of these microorganisms. The sickness we, as humans get, are caused by microorganisms we call “*germs*”.

- **What do bacteria look like?** They come in different shapes and sizes. The common shapes are: rods (bacillus), spirals (spirillum) and spheres (coccus)
- **How do they grow?** Bacteria cells don't get bigger. They grow by splitting in two. The two split in to 4, the 4 in to 8, etc. They grow very quickly.

- **What can bad bacteria cause?** They can cause infection of the nervous system called tetanus; strep throat; blood poisoning; a lung infection called pneumonia; tonsillitis; earache and other bad things. We use *antibiotics* to kill bad germs.
- **What are other microorganisms?** They can be divided into 6 main types: *archaea*, *bacteria*, *fungi*, *protista*, *viruses* and *microbial mergers*.

ACTIVE PARTICIPATION:

(Divide the class into five groups. Each group get's one culture)

Here are your directions:

- 1) Take a culture dish and observe it using your magnifying glass (or place it under a microscope, if possible).
- 2) Draw pictures of what you see under your microscope.
- 3) Compare different pictures and cultures from other teams.

CLOSURE:

Using the microscope and learning about things that are not seen everyday is most interesting. In later years, if you like researching the unknown, maybe this type lesson will be a spark of interest for those scientific, in-depth studies. Hopefully so. Maybe you will be a doctor someday. It would be great if we helped turn out a doctor who conquered cancer or some of the other dreaded diseases.

- 1) Explain how you could help people using a microscope?
- 2) Draw pictures of what you think bad bacteria looks like?