

**Project FOCUS
Best Lessons
FIFTH GRADE**

Title of Lesson: Bacteria and Hand Washing

Theme: Life Science

Unit Number: 1 **Unit Title:** Cells and Microorganisms

Performance Standard(s) Covered (enter codes):

S5CS8. Students will understand important features of the process of scientific inquiry.

S5L4. Students will relate how microorganisms benefit or harm larger organisms.

S5CS1. Students will be aware of the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.

Enduring Standards (objectives of activity):

Habits of Mind

- Asks questions
- Uses numbers to quantify
- Works in a group
- Uses tools to measure and view
- Looks at how parts of things are needed
- Describes and compares using physical attributes
- Observes using senses
- Draws and describes observations

Content (key terms and topics covered):

harmful bacteria, helpful bacteria, bacterium, single-celled

Learning Activity (Description in Steps)

Abstract (limit 100 characters): Students will learn the importance of hand-washing while learning about characteristics of bacteria.

Details:

Introduction: Play a guessing game with students. You will describe something and they have to guess what you are describing. Don't give the whole description at once, but as you describe, let students guess.

Description:

1. Something that is alive.
2. There are approximately five million trillion trillion of these on the earth.
3. These things multiply very rapidly. They can double as quickly as ten minutes.
4. Can live in live in extreme temperatures. Some have been found to live in under water volcano vents where it gets as hot as 700°F and others live at the South Pole in temperatures as cold as - 120 °F.
5. These live almost everywhere. They cover everything, including your skin. They live in water, dirt, food, and in the air. They live inside you: in your mouth, stomach, and lungs.

6. Some live in radioactive (nuclear) waste.

7. Is so small we can only see it with a microscope.

Answer: Bacteria

Transition: "Today we are going to learn about bacteria."

Lecture/Discussion:

"Bacteria are living things that have only one cell. There are many different species of bacteria. Here are some pictures of bacteria magnified many, many times." (Show students pictures of magnified bacteria. Point out that bacteria are different shapes.)

"Do you think that bacteria are good or bad?" (Let students answer.) "Actually, that was a trick question. Some species of bacteria are harmful and some are good."

Make a T-chart on the board to discuss the differences between harmful and helpful bacteria (below). Ask students to copy chart in their science journals.

Discuss ways bacteria can be harmful and the solution/prevention of these problems.

- Bacterial Infections; Solution: Antibiotics**
- Cavities; Solution: brushing teeth and flossing**
- Body Odor; Prevention: washing daily and wearing deodorant.**

Discuss ways that bacteria are helpful.

- Good bacteria in the digestive systems of people and animals help break down food so that nutrients can be used and the waste disposed off.**
- Bacteria help garbage and sewage to decompose.**
- Dead Bacteria are used to produce antibiotics, and vaccines which help our bodies fight off bad or harmful bacteria.**
- Some bacteria produce oxygen.**

"The amount of good bacteria in the world far out numbers the amount of bad bacteria. Bacteria are necessary for human life. We just need to be careful not to spread bad bacteria. One simple way to prevent the spread of bacteria is hand washing."

"We come into contact with trillions of bacteria every day. Every time we touch a door knob, pick up the phone or a pen or pencil. Just imagine that the person who touched that doorknob or pencil just sneezed on their hands and before that used the restroom and did not wash their hands. Yuck! No wonder sickness goes around. What can we do to prevent some of the bacteria spreading and sharing? Wash our hands! That is right. It is that simple. When we wash our hands, the bacteria are washed off and down the drain."

Procedure: Choose two students and rub shortening on their hands. The shortening represents your skin's natural oils. Sprinkle lots and lots of nutmeg on the shortening covered hands. This represents the millions of bacteria on our hands. Have one student wash his hands in cold water for 20 seconds, then dry his hands on a paper towel. Have the second student wash his hands with

warm water and soap for 20 seconds also, then wipe his hands on a paper towel. Compare the paper towels. Have students report results.

Conclusion: Plain water cannot fight bacteria. Soap and water removes bacteria that are trapped in the skin's oils. Washing hands regularly is one of the best ways to ward off bacteria.

Closure: Review the material covered in lecture with question and answers.

Q: "How many cells are in one bacterium?"

A: "One"

Q: "Where are bacteria located?"

A: "They cover almost everything; they are inside of your mouth and digestive system, in air, water, dirt."

Q: "How big are bacteria?"

A: "They are so small that we can only see them with a microscope."

Q: "What is one way bacteria are harmful?"

A: "Body odor, infections, food poisoning, cavities, etc."

Q: "What are some ways that bacteria are helpful?"

A: "Help waste to decompose, make oxygen, help food digest, used to make medicines."

Q: "Are there more helpful or more harmful bacteria?"

A: "more helpful."

Have students respond to the following questions in their science journal.

1. What happened when the student washed their hands with just cold water?
2. What happened when the student washed their hands with soap and warm water?
3. Why do you think this happened?
4. How should somebody wash their hands to ensure they kill bacteria?

Materials Needed (Type and Quantity):

shortening (or vaseline), nutmeg, soap, water (cold and warm), paper towels, pictures of bacteria

Notes and Tips (suggested changes, alternative methods, cautions):

Make sure students that you choose to demonstrate the hand washing are not allergic to the materials.

Sources/References:

1)

<http://www.lessonplanspage.com/SciencePEBacteriaFriendOrFoeAndProperHandWashing45.htm>

2)

3)

