



# Meet The Microbes!

## Pre-Assessments

### NGSS Alignment

#### CORE IDEAS

##### Core Idea LS1: From Molecules to Organisms: Structures and Processes

LS1.A: Structure and Function

##### Core Idea LS2: Ecosystems: Interactions, Energy, and Dynamics

LS2.B: Cycles of Matter and Energy Transfer in Ecosystems

#### CROSS CUTTING CONCEPTS

- Patterns
- Cause and effect: Mechanism and explanation**
- Scale, proportion, and quantity
- Systems and system models
- Energy and matter: Flows, cycles, and conservation**
- Structure and function
- Stability and change

#### PRACTICES

- Asking questions (for science) and defining problems (for engineering)**
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics, information and computer technology, and computational thinking
- Constructing explanations (for science) and designing solutions (for engineering)**
- Engaging in argument from evidence**
- Obtaining, evaluating, and communicating information

# INTRODUCTION

## Learning Objectives

Students are introduced to the idea that microbes exist virtually everywhere, even in extreme environments, and that some microbes are beneficial while others are harmful to other organisms or the environment.

## Essential Questions



1. **What is a microbe?**
2. **Are microbes good/beneficial or bad/harmful?**
3. **What do microbes look like?**  
How big are microbes?  
Student Activity: How big are microbes?
4. **What shape are microbes?**  
Student Activity: Make a Microbe
5. **Where do microbes live?**  
Extremophiles  
Student Activity: Extremophile Wanted Poster

## By The End of This Lesson...

### Students will understand that:

- Bacteria, viruses and fungi are three different types of microbes
- Microbes are found virtually everywhere
- Many microbes live in extreme environments
- Microbes have both positive and negative impacts on humans, other organisms, and the environment

### Students will be able to:

- Define what a microbe is
- Use distinguishing characteristics to differentiate between bacteria, viruses and fungi
- Identify positive and negative attributes of microbes
- Explain how microbes are a crucial part of our daily life

# PRE-ASSESSMENTS

## Pre-Assessment: Free Response

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Ask students to write down their ideas on the following questions using only what they already know:

1. What is a **microbe**?
2. What are **germs**?
3. What do you think microbes look like? **Draw a picture** to go with your answer:
4. **Where** are microbes found?
5. In what ways can microbes be **good/beneficial** to other living organisms?
6. In what ways can microbes be **bad/harmful** to other living organisms or the environment?
7. What **questions** do you have about microbes?

## Pre-Assessment: Multiple Choice

Ask students to answer the following questions using only what they already know:

1. The term “Microbes” refers to \_\_\_\_\_
  - a. Bacteria
  - b. Fungi
  - c. Protozoa
  - d. All of the above [i.e. it’s another term for “microorganism”]
  
2. Microbes are \_\_\_\_\_ humans and other organisms
  - a. good for
  - b. bad for
  - c. good or bad for (depends on the type of microbe)
  
3. Microbes are important to the environment because they
  - a. act as a food source for larger organisms
  - b. break down dead organisms and waste
  - c. clean up toxic waste sites
  - d. all of the above
  
4. What scale would be best to measure the size of microbes?
  - a. meters
  - b. centimeters (hundredths of a meter)
  - c. millimeters (thousandths of a meter)
  - d. micrometers (millionths of a meter)
  - e. nanometers (billionths of a meter)

**True or False:**

- |   |      |       |
|---|------|-------|
| 5. All microbes carry disease and cause people to be sick     | TRUE | FALSE |
| 6. Microbes are on your skin and in your body                 | TRUE | FALSE |
| 7. Microbes only live in dead organisms                       | TRUE | FALSE |
| 8. Microbes only live in soil                                 | TRUE | FALSE |
| 9. Microbes can only grow in darkness                         | TRUE | FALSE |
| 10. Microbes can only live if oxygen is present               | TRUE | FALSE |
| 11. Microbes can only live in temperatures between 0°- 80 ° C | TRUE | FALSE |