



Title: Meet the Microbes (2526)

Level: 5th grade

Location: Local School

Type: Outreach

Length: 60 minutes

Limit: 1 class (32 students)

Program Description

Get a cell's-eye view of the microbes that live in, on, and all around us. After reviewing the parts of cells, students will investigate larger-than-life microbes, share their findings, and work together to sort the microbes by type, where they live, and if they're harmful or helpful. Students will then conduct an experiment to compare the numbers and types microbes living on different surfaces in and around the classroom.

This program is offered in partnership with Emory University and the National Science Foundation.

Standards

S5L4. Obtain, evaluate, and communicate information about how microorganisms benefit or harm larger organisms.

- a. Construct an argument using scientific evidence to support a claim that some microorganisms are beneficial.
- b. Construct an argument using scientific evidence to support a claim that some microorganisms are harmful.

S5L3b. Develop a model to identify and label parts of a plant cell (membrane, wall, cytoplasm, nucleus, chloroplasts) and of an animal cell (membrane, cytoplasm, nucleus).

Vocabulary

Cell	Cell Membrane	Microbe	Fungus
Nucleus	Chloroplast	Bacteria	Culture
Cytoplasm	Harmful	Virus	Hypothesis
Cell Wall	Beneficial	Protist	Experiment

Pre-Visit Activities

Review the parts of a cell (nucleus, cytoplasm, cell wall, cell membrane, and – for plant cells – chloroplast), and the difference between animal and plant cells.

Post-Visit Activities

Microbes in the Classroom: Completing the Experiment

After the FSC class, the instructor will take the students' microbe cultures to Emory University. The cultures will be grown and photographed for 10 days, and the students will be able to view their microbes online at www.mycrobes.org so they can determine which classroom surfaces had the most microbes. The instructor will provide student worksheets and teacher guidelines for students to complete the experiment, graph their data, and evaluate their results and hypotheses.

ELA Extensions

Option A: Research Investigation (ELAGSE5RI10, W,2,4,6,78,9)

Have students research and report on the microbe they chose in class. In addition to written reports, students can write news blasts about their microbe, dress up as and present their microbe to the class, create posters, or explore other creative ways to let the public know about their microbe, its habitat, history, and how it harms and/or helps people.

Option B: Opinion Essay (ELAGSE5W1,4,5,6)

Based on their research and what they learned in class, have students write an opinion essay about one of the following prompts:

- Are microbes harmful or helpful? Why?
- Imagine a scientist just developed a new chemical that would get rid of all of the microbes on earth. Should the scientist use it? Why or why not?

Resources:

<http://www.e-bug.eu/> : Excellent K-12 teacher resources for teaching microbiology, including videos, labs, curriculum, background information, and more.

<http://www.cdc.gov/bam/index.html> : CDC's "Body and Mind" website for education about health and disease. Includes student pages, games, and Teacher's Corner with additional lesson plans (under "Activities")

Note:

Because this program is being conducted in partnership with Emory University as part of a grant from the National Science Foundation, pre- and post-visit data on program efficacy and student knowledge will be collected.