

What Microbe Are You?

Background & Key Concepts

Microbes are often viewed in a negative light. When most people think of microbes, they envision harmful bacteria and associated diseases, but the "bad guys" comprise only a small fraction of all known bacteria. The vast majority of microbes are not only beneficial but in fact necessary for the existence of all other life on Earth (CMORE, 2008)!

"What Microbe Are You?" attempts to change the way students – and teachers – think about microbes through a "personality quiz" designed to match the quiz-taker with the microbe that s/he most closely resembles. Nineteen choices of microbes are provided, emphasizing the diversity of these highly versatile organisms. To help students determine their microbial match, a series of either/or statements are provided. In each pair of statements, students select the statement that most closely describes them and, depending on their answer, are directed to a new pair of statements. These statements are linked to a dichotomous key that relates the student's personality traits to those of a given microbe. At the end of the quiz, when students are assigned their microbial matches, the microbes are given fun code names to substitute for the difficult pronunciation of the microbes' scientific names.

Note: This "What Microbe Are You?" quiz (Hsia et al, 2011) is designed for elementary school students. It is based on a quiz of the same name which was developed for older students (Weersing et al, 2010).

Hawai'i Content & Performance Standards (HCPS III)

The following standards and benchmarks can be addressed using this lesson:

Science Standard 1: The Scientific Process: **SCIENTIFIC INVESTIGATION**: Discover, invent, and investigate using the skills necessary to engage in the scientific process.

Grade 3 Benchmarks for Science:

Benchmark SC.3.1.2 Safely collect and analyze data to answer a question.

Science Standard 5: **Life and Environmental Sciences: DIVERSITY, GENETICS, AND EVOLUTION: Understand genetics and biological evolution and their impact on the unity and diversity of organisms.**

Grade 4 Benchmarks for Science:

Benchmark SC.4.5.3 Describe how different organisms need specific environmental conditions to survive.

Materials (for each pair of students)

- "What Microbe Are You?" PDF Flipbook or an online version found at:
http://cmore.soest.hawaii.edu/education/kidskorner/elem_quiz/elem_ur_q1.htm
- Scissors
- Stapler

Procedure

Advanced Procedure

- 1) Download and print (double-sided) the PDF microbe quiz flipbook found at:
http://cmore.soest.hawaii.edu/education/kidskorner/microbe_quiz.htm

- 2) To assemble, cut each page in half the short way, and then staple into a booklet. Students can share a flipbook with a partner, so that the teacher will only need to assemble one flipbook per pair of students. Alternatively, students can assemble the flipbooks themselves.

Introduction

- 1) Ask the students what they know about microbes (e.g., bacteria and viruses). Are they good or bad (most are good, very few are bad)? Where do they live (everywhere: in the ocean, the rivers, in the soil!)? What do they do (some can fix nitrogen from the air for biological uses, some put oxygen into the atmosphere, some can breakdown decaying material)?
- 2) Explain to them that they will be taking a personality matching quiz to match their interests to a marine microbe.
- 3) Students will work in pairs with a flipbook. In each pair, one student will ask the other student the questions. Once a microbial match has been made, the students will switch roles (the student that was originally answering the questions will now ask the questions).
- 4) If using a computer, type in the following address onto each computer:
http://cmore.soest.hawaii.edu/education/kidskorner/elem_quiz/elem_ur_q1.htm
Each student should answer the either/or statements individually.



Discussion/Questions

Ask students to compare with one another or the class their “microbial matches”. Discuss the vast diversity of microbes, the different (and in some cases, extreme) environments in which microbes live, their various adaptations, and the way scientists, such as those at C-MORE, classify microbes (CMORE, 2008). A dichotomous key can be found at:

http://cmore.soest.hawaii.edu/education/teachers/documents/personality_paths_english.pdf

References Cited

1. C-MORE. 2008. Key Concepts in Microbial Oceanography. Center for Microbial Oceanography: Research and Education (C-MORE).
http://cmore.soest.hawaii.edu/downloads/MO_key_concepts_hi-res.pdf
2. Hsia, Michelle H., Kimberley A. Thomas, Barbara C. Bruno. 2011. What Microbe Are You? An activity designed for our youngest scientists. *American Society for Microbiology Classroom and Outreach Activities (online)*.
http://cmore.soest.hawaii.edu/downloads/hsia_what_microbe_are_you_final.pdf
3. Weersing, Kimberly, Jacqueline Padilla-Gamiño, Barbara Bruno. 2010. What Microbe Are You? *The Science Teacher* 77 (6): 40-44.
http://cmore.soest.hawaii.edu/downloads/Weersing_et_al_2010.pdf