Curriculum Units by Fellows of the Yale-New Haven Teachers Institute
2010 Volume III: Geomicrobiology: How Microbes Shape Our Planet

The Wonders of Bacteria

Guide for Curriculum Unit 10.03.01
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The purpose of this unit is to introduce students to the invisible world of bacteria. Bacteria play a significant role in our lives and in natural ecosystems; yet we cannot see this with our naked eyes. Through this unit, students will develop a deeper understanding for the classification of bacteria, practice some lab techniques that will improve their experimental design skills, and use a microscope to explore the amazing world of bacteria.

The background information sheds light on the differences among prokaryotes including shape, chemical structure of the cell wall, reproduction, and styles of movement of prokaryotes in their environment. However, no characteristic of prokaryotes can illustrate their diversity more than the methods they use to obtain energy. This diversity can have a direct impact on our lives either by producing organic carbon, formation of iron deposits, producing oxygen in the biosphere or recycling organic matter in nature. The unit will also explain how bacteria can cause diseases and reasons why some bacteria are becoming resistant to antibiotics.

The unit includes many hands-on activities that allow students to draw the shape of bacteria, and teaches them about exponential growth. It also includes a Gram-staining technique, and an antibiotic sensitivity lab. In addition, students will complete a research project about the role of bacteria in science, society and technology. They will make a brochure and will be evaluated using a rubric.

(Developed for Biology, grade 10; recommended for Biology, grades 9-10)