



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

Microbial Influence on Earth's Systems

Guide for Curriculum Unit 10.03.06
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The purpose of this unit is to examine the influences microbes have on Earth's systems. For identification purposes and more detailed study Earth is broken down into four spheres: atmosphere, hydrosphere, lithosphere, and biosphere. As separate as these spheres sound, they work together to create the planet that we inhabit.

The unit includes background information on Earth's origin, microbes, and biogeochemical cycles. An outline of Earth's origin is discussed from the time of the Big Bang to the accretion of the planet. From that point the unit fast forwards to about 3.8 billion years ago, the documented time of the first microbes. It discusses how microbes changed the atmosphere into one that was oxygen rich and able to support eukaryotes. A classification scheme for prokaryotes is discussed, focusing on metabolism and outlining the major groups of bacteria and archaea. Following the background information on Earth and microbes is a section on the carbon, nitrogen and phosphorus cycles and the influence that microbes have over these systems.

Sample lessons are included. Each lesson has been created to reinforce the concepts of matter cycling and Earth's integrated systems. The focus of each lesson is to investigate, analyze and communicate findings in writing.

(Recommended for Physical Chemistry, grade 9; Environmental Science and Advanced Placement Environmental Science, grades 11 and 12)

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