

# BIOPROSPECTING FOR CELLULOSE-DEGRADING MICROBES



**Overview:** Students investigate locations they believe harbor cellulose-digesting microbes, collect samples, isolate them on selective media, and screen them for cellulase activity. These novel microbes may be useful for the production of cellulosic ethanol. In the process they learn about plating techniques, serial dilutions, symbiotic relationships and enzyme specificity.

## LEVELS

High school-Undergraduate

## SUBJECTS

Science, Biotechnology

## OBJECTIVES

- Identify the role of cellulose-degrading microbes in biofuels production.
- Explain the function of cellulase enzymes and the challenges in breaking down the cellulose within the plant.
- Identify the symbiotic relationships within an environmental sample that allows for the breakdown of plant cell wall components into food (glucose).
- Justify their environmental sample choice.
- Demonstrate how to isolate microbes from an environmental sample.
- Evaluate an environmental sample for cellulose-degrading microbes.

## MATERIALS

Bioprospecting package

## ACTIVITY TIME

Seven 50-minute class periods over 12-18 days

## STANDARDS

AAAS Project 2061

- 1B The Nature of Science:
- Scientific Inquiry
- 3C The Nature of Technology: Issues in Technology
- 5D Interdependence of Life
- 12C Manipulation and Observation
- 12D Communication Skills

AAAS. 1993. *Benchmarks for Science Literacy: Project 2061.* Oxford University Press. New York

