

# FERMENTATION CHALLENGE



**Overview:** Students will design their own experiment and collect data to investigate the ability of yeast to metabolize a variety of feedstocks originating from different carbohydrate sources. Teachers demonstrate yeasts' inability to metabolize certain food sources. Students are encouraged to think about potential feedstocks and the biochemical processes necessary to convert each type of carbohydrate into fuel.

## LEVELS

High school - Undergraduate

## SUBJECTS

Science, Biotechnology

## OBJECTIVES

- Identify carbohydrates found in different plant parts.
- List the products of fermentation.
- Explain that due to enzyme specificity yeast can only metabolize sucrose, not starch or cellulose.
- Infer metabolic rates through measurement of carbon dioxide production.
- Propose methods, such as heat and enzymes, to digest complex carbohydrates into simple sugars.

## MATERIALS

Fermentation Challenge package

## ACTIVITY TIME

Variable: Three to Five 50-minute class periods

## STANDARDS

### AAAS Project 2061:

- 1B The Nature of Science: Scientific Inquiry
- 3A The Nature of Technology: Technology and Science
- 4D The Physical Setting: Structure of Matter
- 4E The Physical Setting: Energy Transformations
- 5C The Living Environment: Cells
- 5E The Living Environment: Flow of Matter and Energy
- 8B The Designed World: Materials and Manufacturing
- 12B Habits of Mind: Computation and Estimation

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

