GREEN REVOLUTION

About the Series

Coming up with better ways to get where we need to go and power the lives we live requires development of new technologies, along with research to help us minimize the impact of these technologies on our environment. The overall goal of this series is to encourage people to ask questions and look beyond fossil fuels for innovative solutions to our ever-growing energy needs. Interest in science and technology provides the necessary foundation for our future in a world powered by clean energy. The series also provides insight into what careers in science, engineering and other topics related to clean energy technologies are really like.

In this Episode

We explore how different types of biomass can be used to produce fuel.

At Arizona State University, engineering graduate student Emil Puruhito is building reactors to grow algae used to create biofuel at the Laboratory for Algae Research and Biotechnology.

Researchers at the University of Wisconsin are looking to nature to solve a different biofuel problem: conversion of cellulose in plants to a fermentable sugar used to make ethanol. Garret Suen in the Currie Lab explains how leafcutter ant colonies can teach us a lot about breaking down biomass.

Finally, engineer George Huber at the University of Massachusetts Amherst shows us how his lab uses chemistry and heat to turn waste from a sawmill into bio-oil and gasoline.

Green gasoline could be a key way to turn algae, agricultural waste and non-food plants into the fuel of the future.

Concepts

- Chemical elements can form molecules that interact to perform the basic functions of life.
- In a chemical reaction, one or more reactants are transformed into new products.
- Bioengineering technologies explore the production of devices, substances and organisms to improve our daily lives.

Content Standards

Biology/Physics
Middle School*

14. (BIO) Explain the roles and relationships among producers, consumers and decomposers in the process of energy transfer in a food web.
15. (BIO) Dead plants and animals are broken down by other living organisms. This process contributes to the ecosystem as a whole.
16. (BIO) Plants containing chlorophyll use energy from sunlight to make sugars from carbon dioxide and water through a process called photosynthesis.
5. (PHYS) There are more than a hundred elements that combine in different ways to make up all of the living and nonliving things that we encounter.

*Based on Massachusetts Science and Technology/Engineering Curriculum Framework, October 2006