

# K-12 Energy Lessons and Activities

## Grades 9-12

Here you'll find lesson plans on energy efficiency and renewable energy for grades 9-12.

### Biomass Energy

- Biofuel Production (8 Activities)
  - The Biofuel Project: Creating Bio-diesel
  - A Pre-Treatment Model for Ethanol Production Using a Colorimetric Analysis of Starch Solutions (1 Activity)
  - Reaction Rates and Catalysts in Ethanol Production (1 Activity)
  - Investigating and Using Biomass Gases
  - Photosynthesis and Biomass Growth (7 Activities)
  - Renewable Energy Plants in Your Gas Tank: From Photosynthesis to Ethanol (4 Activities)
  - Statistical Analysis of Corn Plants and Ethanol Production

### Energy Basics

- Energy Posters - Energy Basics
- Secondary Energy Infobook and Secondary Infobook Activities (19 Activities)
- Thermodynamics Teacher and Student Guides (6 Activities)
- Computer-Based Energy Projects (4 Activities)
- Energy Analysis

### Energy Efficiency and Conservation

- Take the Energy Action Challenge
- Energy Efficiency Ambassadors (9-12)
- Energy Posters - Energy Efficiency and Conservation
- Energy Walkabout
- New Year's Resolution
- Passive Solar Building Design (8 Activities)
- Summer Camp 2050
- Watt Does It Cost To Use It?

### Environment

- Energy Awareness Quiz
- Energy Posters - Environment
- How Big Is Your Footprint?
- Global Warming and Climate Change (8 Activities)

### Hydrogen and Fuel Cells

- Hydrogen Sprint (6 Activities)

### Solar Energy

- Understanding Solar Energy: Advanced Photovoltaic Investigations (5 Activities)
- Solar Cooking (5 Activities)
- Modeling the Process of Mining Silicon Through a Single Displacement/Redox Reaction
- Mini Rockets

**Photovoltaics: Solar Electricity (4 Activities)**  
**Photovoltaics Teacher and Student Guides (10 Activities)**  
**Renewable Energy and Photovoltaics (5 Activities)**  
**Survival Still**  
**What Does the Sun Give Us? (5 Activities)**

### **Transportation Fuels**

**Transportation Fuels: The Future is Today (6 Activities)**  
**Transportation Fuels Rock Performances**

### **Wind Energy**

**Building the Basic PVC Wind Turbine**  
**Wind Power (7 Activities)**  
**Scale Models and Wind Turbines**  
**See the Wind**  
**Wind Turbine Blade Design**