

Energy Learning Objectives and Resources

1. Energy is an essential human need we obtain from our natural resources. What is energy? What are our needs for energy? Understand the different sources of energy - sun, coal, oil, gas, hydro, geothermal, nuclear - and look at how supply and demand are related to our choices of energy resources.

- * Energy Infobooks – NEED <http://www.need.org/EnergyInfobooks.php>
Introduction to Energy
http://www.need.org/needpdf/infobook_activities/SecInfo/IntroS.pdf
Biomass
http://www.need.org/needpdf/infobook_activities/SecInfo/BiomassS.pdf
Coal
http://www.need.org/needpdf/infobook_activities/SecInfo/CoalS.pdf
Geothermal
http://www.need.org/needpdf/infobook_activities/SecInfo/GeothermalS.pdf
Hydrogen
http://www.need.org/needpdf/infobook_activities/SecInfo/HydrogenS.pdf
Hydropower
http://www.need.org/needpdf/infobook_activities/SecInfo/HydroS.pdf
Natural Gas
http://www.need.org/needpdf/infobook_activities/SecInfo/NGasS.pdf
Petroleum
http://www.need.org/needpdf/infobook_activities/SecInfo/PetroS.pdf
Propane
http://www.need.org/needpdf/infobook_activities/SecInfo/PropaneS.pdf
Solar
http://www.need.org/needpdf/infobook_activities/SecInfo/SolarS.pdf
Uranium (Nuclear)
http://www.need.org/needpdf/infobook_activities/SecInfo/UraniumS.pdf
Wind
http://www.need.org/needpdf/infobook_activities/SecInfo/WindS.pdf
Energy Consumption
http://www.need.org/needpdf/infobook_activities/SecInfo/ConsS.pdf
All provided on the 2010 Michigan Envirothon Resource CD.

2. Understand that energy conservation is a consequence of our choices. Become familiar with some ways to practice energy conservation - insulation, efficient products, decisions and choices.

- * *Learning About Saving Energy* – National Renewable Energy Laboratory
<http://www.nrel.gov/docs/legosti/old/16215.pdf>
Provided on the 2010 Michigan Envirothon Resource CD.
- * *How Trees Can Save Energy* – Tree City USA
http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/13/ba/8e.pdf
Provided on the 2010 Michigan Envirothon Resource CD.
- * Energy usage, home and business. Energy conservation

<http://www.classroom-energy.com>

- * *Energy usage, home.*
<http://www.ase.org/section/topic/assessment/www.urbanoptions.org/demonstrationHouseEntrance.php>
Video: Home Court:
http://www.affordablecomfort.org/resources_videos.php?PageID=80&id=1#video
Video: Saving Money on your Electric Bill:
http://www.affordablecomfort.org/resources_videos.php?PageID=80&id=2#video
Video: Energy at Home
http://www.affordablecomfort.org/resources_videos.php?PageID=80&id=3#video
<http://www.aceee.org/consumerguide/checklist.htm>
<http://www.homeenergy.org/>
- * *Energy usage, business.*
http://www.ase.org/uploaded_files/greenschools/School%20Energy%20Guidebook_9-04.pdf
Provided on the 2010 Michigan Envirothon Resource CD.
- * *Energy Myths Exposed* – EcoIQ Magazine; MSN.com; American Council for An Energy Efficient Economy
A hard copy is provided in the Energy Resource Packet.

3. Become familiar with different energy measurement terminology and basic terms when talking about energy.

(The following links also apply to learning objectives #1 and 2.)

- * <http://www.classroom-energy.com>
- * *Energy Sources*
http://library.thinkquest.org/C0110881/energy_en.html#wat
Provided on the 2010 Michigan Envirothon Resource CD.
- * *Natural Gas*
<http://www.naturalgasfacts.org/links.html>
Provided on the 2010 Michigan Envirothon Resource CD.
- * *Oil and Natural Gas*
<http://www.adventuresinenergy.org/index.html>
Provided on the 2010 Michigan Envirothon Resource CD.
- * *Biofuels*
<http://sustainabledesignupdate.com/?cat=8>
- * *Energy Sources – Pro’s and Con’s*
<http://www.api.org/classroom/curricula/energy-sources.cfm>

4. Learn about “alternative energy” - solar, biomass, geothermal, wind, etc.

- * *Renewable Energy: An Overview* – U.S. Department of Energy
<http://www.nrel.gov/docs/fy01osti/27955.pdf>
Provided on the 2010 Michigan Envirothon Resource CD.
- * *Learning about Renewable Energy* – U.S. Department of Energy
<http://www.nrel.gov/learning/>
Provided on the 2010 Michigan Envirothon Resource CD.
- * *Energy Infobooks* – NEED <http://www.need.org/EnergyInfobooks.php>
For the following renewable sources (see learning objective #1 above for links):

Biomass, Geothermal, Hydropower, Solar, and Wind.

Provided on the 2010 Michigan Envirothon Resource CD.

- ★ *Michigan's Renewable Energy and Efficiency Success Stories – Urban Options*

<http://www.urbanoptions.org/RenewableEnergy/index.htm>

Provided on the 2010 Michigan Envirothon Resource CD.

- ★ Fact Sheets – Midwest Renewable Energy Association

http://www.the-mrea.org/fact_sheets.php

Off Grid PV Systems, Solar Domestic Hot Water, Solar Hydronic Radiant Floors, and Straw Bale Construction

All 4 Fact Sheets provided on the 2010 Michigan Envirothon Resource CD.

- ★ *Biofuel Student Glossary*

Provided online at the Michigan Envirothon website and on the 2010 Michigan Envirothon Resource CD.

- ★ *Bioenergy: Power for Agriculture & Conservation – NACD*

<http://www.nacdnet.org/resources/reports/bioenergy.phtml>

5. Understand the different energy requirements for different types of transportation - cars, trucks, buses, airplanes, trains, boats, etc.

- ★ *Transportation – U.S. Department of Energy*

www.energy.gov/energyefficiency/transportation.htm

- ★ *Household Vehicles Energy Use: Latest Data & Trends – Energy Information Admin.*

www.eia.doe.gov/emeu/rtecs/nhts_survey/2001/index.html

6. Identify and study current issues concerning energy production, uses, etc.

- ★ Energy providers and legislative challenges.

www.classroom-energy.org

- ★ Policy

http://www.ase.org/section/_audience/policy

http://www.aceee.org/energy/state/michigan/mi_index.htm

<http://www.acore.org/front>

- ★ Energy Providers

http://www.aceee.org/energy/state/michigan/mi_utility.htm

Additional Internet Resources for Energy

Book: Energy Savings for the Novice - Dennis Fijalkowski and Mary Steele, 1998.

Bioenergy Quiz

http://www.greatlakesbioenergy.org/wp-content/uploads/2008/11/bioenergy_quiz.html

Renewable Energy Opportunities on the Farm – ATTRA

<http://attra.ncat.org/attra-pub/PDF/energyopp.pdf>

U.S. Department of Energy: <http://www.doe.gov>

Energy Information Administration: <http://www.eia.doe.gov>

Office of Energy Efficiency & Renewable Energy: <http://www.eere.energy.gov>

Renewable Resource Data Center: <http://www.nrel.gov/rredc/>