



Energy

PROJECT PLANNING GUIDE

OBJECTIVES OF THE 4-H ENERGY PROGRAM

1. To provide a clear understanding of what energy is.
2. To provide a familiarity with fossil fuels, the main source of U. S. energy.
3. To create concern for how the current rate of consumption of fossil fuels will affect the U. S. economy and 4-H members.
4. To provide specific techniques of conservation that the 4-H'er can practice.
5. To encourage the 4-H'er to seek alternate sources of energy to supplement fossil fuels.

EXTENSION RESOURCE MATERIALS

Unit I. 4-H --The Energy to the Future - County Extension Office

Unit II. 4-H --The Energy of the Future - County Extension Office

Energy Resource Center -- County Extension Office

LEVEL 1
(9- to 11- year-olds)

Things To Learn	Things To Do
1. Definition of energy	<p>1. Identify the items in the room that have potential energy.</p> <p>Set up a line of dominoes and watch the energy transmission as each domino falls on the next.</p> <p>Shoot one marble into a group of marbles. Watch the evidence of energy dispersion.</p>
2. Types of fossil fuels	<p>2. Go to a local natural science museum and see samples of fossils, or examine rocks in your area that might have imprints of fossils.</p> <p>Examine samples of oil and coal before it is processed.</p> <p>Circle those items in the picture in the guide that use oil products</p> <p>Set up a display of the various products and by-products made from crude oil or coal. Have leader demonstrate carbon dioxide gas formation by use of the vinegar-baking soda experiment.</p>
3. The meaning of limited supply	<p>3. Have a popcorn snarf feast.</p> <p>Have an energy auction.</p> <p>See how long the 4-H members can go without energy.</p>
4. The characteristics of different fibers	<p>4. Go to a fabric store and examine the different weaves and weights of fabrics. If the store permits, take samples and mount on a chart for winter and summer fabrics.</p>
5. Ways to dress to fit the temperature	<p>5. Form groups and choose those items most suitable for winter and summer from a mixed selection of clothes.</p>

Things To Learn

Things To Do

6. Ways to avoid energy waste

6. Make energy stick-ups out of contact or gummed paper to place where energy is wasted around the house.

Have an energy stick-up search. Visit 4-H members' homes or farms and identify good places for energy stick ups. Record all the places where energy is being wasted. Make a separate list of all the things that use energy.

7. Ways to plan efficient car use

7. Study information available in the packet "4-H-Energy of the Future" located in Extension Office.

Chart a travel map of your family's daily car use. Then create a second map that shows how you can combine your trips to save energy.

8. Ways to use non-fossil energy sources

8. Make a solar hotdog cooker.

Hang a load of clothes on the clothes line and compare the amount of time it takes for the clothes to dry on the line in comparison to drying them in the clothes dryer.

Tour a hydroelectric plant.

LEVEL 2
(12- to 14-year-olds)

Things To Learn	Things To Do
1. History of fuel	1. Plan a "camp meeting" where only "old" fuels are used--oil lamps, wood fires, candles.
2. How fossil fuel is extracted	2. View slide/tape program of oil well drilling. Visit either an oil or water well drilling site and a finished well. Visit a coal mining site. Construct a model or chart of an oil or gas drilling rig. Call a local investment firm, utility company, or drilling company and ask for a speaker to explain to your group the costs of a well and how it is financed.
3. How coal is converted	3. Do a coal experiment that produces methane gas for an example of coal conversion.
4. Energy terms: BTU, watts, kilowatts, horsepower	4. Read electric and gas meters. Call utility company and get last year's consumption figures. Practice conservation and see which 4-H'er can achieve the greatest percentage reduction of energy use for one to three months. Visit your local utility office. Find out the horsepower or engine size of your family car. Keep a record of the number of miles and amount of gas used. Determine the MPG. Determine the number of gallons per horsepower hour that tractors or motorized equipment use on your
5. The importance of the U. S. being energy self-sufficient	5. Using a creative dramatics approach, make an energy "machine."

Things To Learn	Things To Do
<p>5. continued...</p>	<p>After making the energy machine, form several groups and discuss the effect of the U.S.'s dependency on foreign oil for a major percentage of the U. S. fuel supply.</p> <p>Make a list of the services or products that would be eliminated if half of the fuel supplies were stopped. Try to live without those for one week. Report your success at the next meeting.</p> <p>Create a simulated newscast about the effect of reduced fuel for farm use.</p>
<p>6. Ways to conserve energy through insulation</p>	<p>6. Visit a local lumberyard or hardware store and secure samples of the various types of insulation and caulking supplies.</p> <p>Determine the R value of insulation needed for the walls and ceilings in your home or farm buildings.</p> <p>Do a thermometer experiment.</p>
<p>7. How to caulk</p>	<p>7. Make a draftometer and test your home for air leaks.</p> <p>Practice caulking windows.</p> <p>Install switch plate insulator gaskets.</p> <p>Caulk windows that leak air in your home or heated farm buildings.</p>
<p>8. Ways to use natural fertilizer</p>	<p>8. Plant two gardens, one with organic fertilizer and one with chemical fertilizer. Record results of labor used and costs and compare the produce from each garden.</p>
<p>9. Creating awareness</p>	<p>9. Silk screen or "paint embroider" an energy conservation symbol on T-shirts and wear the shirts to your meetings.</p>

Things To Learn	Things To Do
10. How energy is transmitted	10. Visit your local utilities office or view a film on energy transmission.
11. Positive and negative forces	11. Make or rewire a lamp.
12. How energy is stored	<p>Make a demonstration board that shows various working electrical switches.</p>
13. How energy is converted	12. Make a simple food fuel battery. It should be able to power a small flashlight.
14. How people feel about energy	<p>Make a solar collector.</p>
15. Possible solutions	13. Visit a refining plant or hydroelectric plant.
	14. Conduct a survey at school to see how other students view the energy situation. Compile the results of your questionnaire.
	<p>Write for various free publications about the energy problem. (See the resource list for addresses.) Compare what the questionnaire results show with what the pamphlets state.</p>
	15. Attend a meeting or write to the Environmental Protection Agency to see how EPA pollution standards relate to the energy problem.
	<p>Find out the particulate levels permitted in your drinking water and air in your area. Discuss the level that would be acceptable to you.</p>
	<p>Visit a solar home.</p>
	<p>Discuss the other alternate energy forms such as geothermal, wind, ocean, biomass, nuclear. (Slide and film resources are listed in leader guide.)</p>
	<p>Discuss which of the alternate energy sources could be used on the farm.</p>

Things To Learn	Things To Do
<p>15. continued...</p>	<p>Do a marble splitting experiment to simulate nuclear division.</p> <p>Discuss the feasibility of the widespread use of the alternate energy forms.</p>
<p>LEVEL 3</p>	
<p>(15- to 19-year olds)</p>	
<p>1. Possible careers in the energy field</p> <p>2. Careers that can utilize energy conservation</p> <p>3. Home maintenance techniques for energy conservation</p>	<p>1. Call or write various energy related firms and ask the personnel officer to discuss career opportunities with you or your group.</p> <p>Take several job titles listed in the leader guide and list the activities of people in those positions. Plan a day with a person who has one of those jobs and compare the things he or she does with what you thought he or she would do.</p> <p>2. Design a decorating plan for your bedroom that stresses energy conservation.</p> <p>Visit either commercial buildings, or members' homes and farms and evaluate the effectiveness of landscaping for energy savings.</p> <p>Design a landscaping plan for your home or farm that will reduce energy use.</p> <p>3. Drain off one to two gallons of water from the hot water tank.</p> <p>Change air filter in home heating and cooling systems.</p>

Things To Learn	Things To Do
3. continued...	<p>Tune farm equipment; sharpen blades.</p> <p>Change or empty vacuum cleaner bags.</p> <p>Replace water faucet washers and seats.</p>
4. Car maintenance and driving techniques for energy conservation.	<p>4. Check air pressure in car tires.</p> <p>Replace car air filter.</p> <p>Check emission devices.</p> <p>Change oil and oil filter.</p> <p>Watch a film on driving techniques for fuel conservation.</p>
5. How to cook with less energy.	5. Have a dinner party for 4-H club. All should plan the menu and select the method of cooking for energy conservation.
6. Alternate transportation.	6. Obtain all the needed supplies for the above dinner party or other club function by using transportation other than the family car or truck.

Prepared by
Dalton R. Proctor, Extension State 4-H Leader

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