
ENERGY..IT'S ELECTRIFYING!

Council Own
Program Patch Packet



04-3120
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OVERVIEW

This program patch packet is designed to encourage all Girl Scout grade levels to learn or develop knowledge about electricity and how to be "green" while using it. Girls will discover how electricity is produced; how it can be used while playing games or activities. A Scavenger Hunt game in their home or school will show them how electricity is used in everyday life. All activities are designed to be done as a troop or at home. Leaders and girls are encouraged to visit various web sites to access more games or activities to compliment this program patch packet.

Energy..It's Electrifying! is a Girl Scouts of Central Maryland's Own Program Patch Packet that inspires girls to learn about energy issues and to take action in their communities to reduce energy consumption. The program supports the Girl Scout Leadership Experience for girls by promoting the following goals:

- **Discover** – Explore how energy is produced and used in their everyday life
- **Connect** – Use their knowledge to see how others can reduce energy consumption
- **Take Action** – Make a difference in their communities by replacing incandescent bulbs with compact fluorescent lamp (CFL.)

This program patch activity supports Girl Scouts of Central Maryland's goal to reduce electricity consumption by encouraging girls and their families to replace all incandescent bulbs with the more efficient compact fluorescent lamp (CFL.)

This program patch packet features activities divided in three sections Discover, Connect and Action which again compliments the three leadership keys in the Girl Scout Leadership Experience for girls. To earn the patch, at least two (2) activities need to be done in each of the two sections Discover and Connect. The activity "Change a light bulb" in Action is a mandatory requirement of the program patch activity.

For each activity four levels of complexities will be illustrated. The girls and adults are encouraged to do more or modify the activities to adapt them to the skill of the girls provided that the main message for each activity is conveyed.

ACTIVITIES

Leadership Key: DISCOVER

Scope: Most households in the United States rely on electricity to have light, air conditioning (heat or cold), cooking or refrigeration and entertainment (TV, computer and gadgets.) Do you know when electricity was first discovered? Today whether at home, school or in the community to have light you *just flip a switch* to get light, but it was not always that way. Our ancestors and probably many of your great grandparents or grandparents used a candle.

Below are some activities that will help you answer these questions. You can also search the internet to learn more. Some websites that might be helpful or interesting are:

- <http://www.explainthatstuff.com/electricity.html>
- <http://www.historyforkids.org/scienceforkids/physics/electricity/>
- Invention of the incandescent bulb: <http://www.fi.edu/learn/sci-tech/edison-lightbulb/edison-lightbulb.php?cts=electricity>
- All about CFL: <http://science.howstuffworks.com/earth/green-technology/sustainable/home/cfl-bulb.htm>
- The father of CFL, Ed Hammer: http://news.cnet.com/Father-of-the-compact-fluorescent-bulb-looks-back/2100-11392_3-6202996.html OR <http://blogs.consumerreports.org/home/2008/08/best-cfl-bulbs.html>
- Cleanup of a CFL: <http://www.epa.gov/cfl/cflcleanup.html>
- All about light bulb and safety: <http://www.epa.gov/epawaste/hazard/wastetypes/universal/lamps/faqs.htm>
- Science fair experiments (ideas for more experiments at all levels): http://www.eia.doe.gov/kids/energy.cfm?page=sf_experiments

Activities

1. **Circuit: (Select one (1) activity)**
 - a. **All Grade Levels:** Make a circuit with battery, wires and light bulbs.
 - b. **Daisy/Brownies:** How does a flashlight work? Take one apart and look at all the parts.
 - c. **Junior to Ambassador:** Find an old small appliance, such as a radio, CD player (Hint ask the landfill, or appliance store or second hand stores) and take it apart, look carefully at all the parts and see if you can put it back together. Try to understand what the parts are called or used for.
2. **What is a light bulb? What type of light bulbs are available (Select one (1) activity)** (Hint: incandescent and compact fluorescent lamp (CFL); *All useful website are listed above under scope.*

- a. All Grade Levels: When was the incandescent invented? How does it work? Look at a picture of a light bulb.
 - b. All Grade Levels: When was the Compact Fluorescent Lamp (CFL) invented? How does it work? Look at a picture of a CFL.
 - c. All Grade Levels: What is the difference between the two types in energy consumption? How should you dispose of these two different types of bulbs?
 - d. Junior to Ambassadors: Make a light bulb:
http://invention.smithsonian.org/centerpieces/edison/000_lightbulb_01.asp
3. **Explore careers in the energy field. (Select one (1) activity)** Some ideas are: Engineering (engineers) to build power plants and to operate them; Economy (economist) to determine cost of energy; Marketing and Communications to promote and sell energy; find others
- a. All Grade Levels: Make a list of jobs needed from production of electricity to consumption.
 - b. All Grade Levels: Interview a woman who has a job related to energy.
4. **Visit a power plant or generate your own electricity (Select one (1) activity)**
- a. All Grade Levels: Visit a power plant.
 - b. All Grade Levels: Make a lemon battery:
<http://www.energyquest.ca.gov/projects/lemon.html>
 - c. Juniors to Ambassadors: Build an electric motor:
http://www.sciencebuddies.org/science-fair-projects/project_ideas/Elec_p009.shtml
 - d. All Grade Levels: explore other ideas for projects at:
http://www.sciencebuddies.org/science-fair-projects/recommender_interest_area.php?ia=Energy

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| <p>Leadership Key: CONNECT</p> |
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Scope: Investigate how much electricity or other energy is used around you. Investigate how energy is produced? And find how you can save energy? The goal is to become aware on how energy and in particular how electricity is used around you. How is the electricity produced in your area? Are there other ways to generate electricity? Does the production of electricity create pollution? Explore how other countries use electricity. Do they use as much as we do?

You can also search the internet to learn more. Some websites that might be interesting:

- Energy Consumption in USA:
http://www.eia.doe.gov/kids/energy.cfm?page=us_energy_use-basics
- Energy sources: <http://www.eia.doe.gov/kids/energy.cfm?page=2>
- Teacher guides with list of activity for all levels:
http://www.eia.doe.gov/kids/energy.cfm?page=teacher_guide

1. Electricity consumption (Select one (1) activity)

- a. All Grade Levels: In your house, ask your parents to see the electricity bill. How many kilowatts (kWh) does your family use per month? How many kWh in a year? Does it change from winter and summer? If so, why?
- b. Juniors to Ambassadors: Find out how much electricity is used in your county or state? (Hint ask your local electrical utility company or search the web.)

2. Conservation (Select one (1) activity)

- a. All Grade Levels: Conduct a home inspection to determine where the most electricity is consumed.
 - Daisy/Brownies: Use the following questionnaire as an example:
http://www.e-smartonline.net/bge/images/BGE_esmart_ee_inspection.pdf
 - Juniors to Ambassadors: You can use one of the following calculators:
<http://showcase.netins.net/web/farmers/energy.html> or
<http://www.csgnetwork.com/elecenergycalcs.html>
- b. All Grade Levels: Write three (3) ideas on how to use less electricity. Try to apply them in your house or school.
- c. Daisy/Brownies: Games: you can play the following games online:
 - <http://www.e-smartonline.net/bge/games/guzzler/game.html>
 - http://www.e-smartonline.net/bge/games/dangers_elec.html
- d. Juniors to Ambassadors: You can play a game of sudoku
 - http://www.eia.doe.gov/kids/energy.cfm?page=energy_sudoku

3. Energy around the world and around the country (Select 1 activity)

- a. Juniors to Ambassadors: Explore consumption around the states in USA: http://www.eia.doe.gov/states/_states.html; by country: <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2042rank.html> Or http://www.nationmaster.com/graph/ene_ele_con-energy-electricity-consumption
- b. All Grade Levels: Does every country use as much electricity as United States? <http://www.mapsofworld.com/thematic-maps/> and look for *Energy – World Electricity consumption map*
- c. All Grade Levels: What other types of energy other than electricity is used around the world for heat, light, etc.?

Leadership Key: TAKE ACTION

Scope: Plan and execute an activity to promote energy savings or teach other about electricity. One of the main activities would be to replace as many incandescent bulbs with the efficient CFL as possible.

1. *Change a light bulb*

All Grade Levels: Replace at least one incandescent light bulb with a CFL. Daisies and Brownies can do it just at home; Junior to Ambassadors could campaign at school, church or other locations.

2. *Advocate energy savings*

All Grade Levels: Prepare a poster to show the benefit to conserve energy OR to replace an incandescent bulb with a CFL. List how to recycle the broken/old bulb.

3. *Your own project:* Imagine your own project to encourage saving energy. Can you do something around your house, school, church to make a difference?

Other Resources

Booklets from BGE: http://www.e-smartonline.net/bge/teachers/order_form.html
BGE: including safety http://www.e-smartonline.net/bge/activities/activity_landing.html
GSCNC challenge: <http://www.gscnc.org/lightbulbchallenge.html>