

Thousand Islands Girl Scout Council

OUR COUNCIL'S OWN BADGE

ELECTRICITY/ELECTRONICS

for girls 11-17 and Cadette/Senior Girl Scouts



*Choose two skill builders, one technology, one service project,
one career exploration and two activities from any category,*

This IP is the creation of the Chemistry and Physics clubs at St. Lawrence University, with help of Agnes Hoey of SLU's Information Technology Dept.

SKILL BUILDERS

1.	Be able to define five of the following terms: circuit, voltage, current, Ohm's Law, conductors, semi-conductors, insulators, battery, alternator, AC/DC, generator, magnetic field, transformers, shock, static, series circuits, parallel circuits, energy. How do they relate to each other?
2.	Draw a simple schematic diagram, showing resistors, capacitors, and transistors or integrated circuits. Using correct symbols, label all parts. Explain the purpose of each part of your diagram.
3.	Explain at least three audio applications of electronics. Diagram or build a circuit to show at least one of these applications.
4.	Explain about the basic principles of digital techniques. Show how to change three decimal numbers into binary numbers, and three binary numbers into decimal numbers. Diagram or build a circuit to show digital techniques.
5.	Explain how to solve a simple problem involving current, voltage, and resistance using Ohm's Law.
6.	Research at least three different types of test equipment used in electronics. Explain the need for test equipment and how they operate.
7.	What is the difference between electricity and electronics? How has electricity changed in the past 100 years? How do you think it will change in the next 100 years?
8.	Create a timeline showing inventors and their inventions based on electricity. Select one and explain why this was an important invention and how it helped society.
9.	Determine how your home receives electricity. What is the origin of the electricity? Learn how to read your electric meter. What does it cost to provide electricity to your home? What are some of the ways you could decrease the costs? Share what you find with your family.

10.	What are some of the different ways electricity is generated? Which ones are most common in your area? What is the relative cost for each? What are the positive and negatives of each? Compare the methods and costs with those in other areas of the country/world.
11.	Electricity is used in many homes; however, not all have electricity. For those without, how does their lifestyle differ from yours? Keep a log for a week listing all the things you use that require electricity. Which of them could you do without electricity?
TECHNOLOGY	
1.	Explain static electricity and do at least one demonstration that shows the basic principles of static electricity.
2.	Research how a battery works. Be able to explain how a battery works using a diagram. What is the difference between the different types of batteries? If possible, build a simple battery.
3.	Explain the function of a printed circuit board. What precautions should be observed with soldering printed circuit boards? If possible, show the right way to solder and unsolder, and how to avoid heat damage to the components.
CAREER EXPLORATION	
1.	Research three careers in electronics. What education or training is needed? Are these traditional careers for women?
2.	What organizations are there for women in electrical fields? Are there organizations or groups only for women? Research these organizations and share your findings with others. If possible, attend a meeting or ask someone from one of the organizations to come and speak with your troop or group.
3.	If possible, tour a plant that generates energy. What types of jobs are available? What is used to produce the power or electricity? How is it harnessed? Where does the power or electricity go?
4.	Research what training and education is needed to be a licensed electrician. Is this a traditional field for women? If possible, shadow an electrician.
SERVICE PROJECT	
1.	Create a poster or game for younger girls safety around electricity and electronics.
2.	With a group of younger girls, put on an Electricity Show with simple and safe demonstrations of electricity.

