



**ENERGY MERIT BADGE WORKBOOK**

This Scoutmaster Bucky Merit Badge Workbook is based off the current *Scouts BSA Requirements*.

Consider also using the Energy merit badge class preparation page for clarification and expectations when participating in a Scoutmaster Bucky merit badge opportunity ([online](#) or [in-person](#)).

<https://scoutmasterbucky.com/merit-badges/energy/>

Scout's Name:

**REQUIREMENT 1:** Do the following:

**REQUIREMENT 1 A:** With your parent's permission, use the internet to find a blog, podcast, website, or an article on the use or conservation of energy. Discuss with your counselor what details in the article were interesting to you, the questions it raises, and what ideas it addresses that you do not understand.

**REQUIREMENT 1 B:** After you have completed requirements 2 through 8, revisit your source for requirement 1a. Explain to your counselor what you have learned in completing the requirements that helps you better understand the article.

**REQUIREMENT 2:** Show you understand energy forms and conversions by doing the following:



**REQUIREMENT 2 A:** Explain how THREE of the following devices use energy, and explain their energy conversions: toaster, greenhouse, lightbulb, bow drill, cell phone, nuclear reactor, sweat lodge.


**REQUIREMENT 2 B:** Construct a system that makes at least two energy conversions and explain this to your counselor.

Completed

**REQUIREMENT 3:** Show you understand energy efficiency by explaining to your counselor a common example of a situation where energy moves through a system to produce a useful result. Do the following:

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**REQUIREMENT 3 A:** Identify the parts of the system that are affected by the energy movement.

**REQUIREMENT 3 B:** Name the system's primary source of energy.

**REQUIREMENT 3 C:** Identify the useful outcomes of the system.

**REQUIREMENT 3 D:** Identify the energy losses of the system.

**REQUIREMENT 4:** Conduct an energy audit of your home. Keep a 14-day log that records what you and your family did to reduce energy use. Include the following in your report and, after the 14-day period, discuss what you have learned with your counselor.



Energy audit of your home

14-day log



What you have learned

**REQUIREMENT 4 A:** List the types of energy used in your home such as electricity, wood, oil, liquid petroleum, and natural gas, and tell how each is delivered and measured, and the current cost; OR record the transportation fuel used, miles driven, miles per gallon, and trips using your family car or another vehicle.

**REQUIREMENT 4 B:** Describe ways you and your family can use energy resources more wisely. In preparing your discussion, consider the energy required for the things you do and use on a daily basis (cooking, showering, using lights, driving, watching TV, using the computer). Explain what is meant by sustainable energy sources. Explain how you can change your energy use through reuse and recycling.



Ways you and your family can use energy resources more wisely

Energy required for the things you do and use on a daily basis

What is meant by sustainable energy sources

How you can change your energy use through reuse and recycling



**REQUIREMENT 5:** In a notebook, identify and describe five examples of energy waste in your school or community. Suggest in each case possible ways to reduce this waste. Describe the idea of trade-offs in energy use. In your response, do the following:

Example of energy waste	Possible ways to reduce this waste

The idea of trade-offs in energy use.

**REQUIREMENT 5 A:** Explain how the changes you suggest would lower costs, reduce pollution, or otherwise improve your community.



**REQUIREMENT 5 B:** Explain what changes to routines, habits, or convenience are necessary to reduce energy waste. Tell why people might resist the changes you suggest.

**REQUIREMENT 6:** Prepare pie charts showing the following information, and explain to your counselor the important ideas each chart reveals. Tell where you got your information. Explain how cost affects the use of a nonrenewable energy resource and makes alternatives practical.

How cost affects the use of a nonrenewable energy resource and makes alternatives practical

**REQUIREMENT 6 A:** The energy resources that supply the United States with most of its energy





Pie chart

Where you got your information



**REQUIREMENT 6 B:** The share of energy resources used by the United States that comes from other countries

Pie chart

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Where you got your information

Blank area for writing the source of information.



**REQUIREMENT 6 C: The proportion of energy resources used by homes, businesses, industry, and transportation**

Pie chart

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Where you got your information

Blank area for writing where the information was obtained.



**REQUIREMENT 6 D: The fuels used to generate America's electricity**

Pie chart

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Where you got your information

Blank area for writing where the information was obtained.



**REQUIREMENT 6 E:** The world's known and estimated primary energy resource reserves

Pie chart

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Where you got your information

Blank area for writing where the information was obtained.



**REQUIREMENT 7:** Tell what is being done to make FIVE of the following energy systems produce more usable energy. In your explanation, describe the technology, cost, environmental impacts, and safety concerns.

- Biomass digesters or waste-to-energy plants
- Cogeneration plants
- Fossil fuel power plants
- Fuel cells
- Geothermal power plants
- Nuclear power plants
- Solar power systems
- Tidal energy, wave energy, or ocean thermal energy conversion devices
- Wind turbines

First energy source

What is being done to make it produce more usable energy

Technology

Cost



Environmental impacts	Safety concerns

Second energy source

What is being done to make it produce more usable energy

Technology	Cost

Environmental impacts	Safety concerns



Third energy source
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What is being done to make it produce more usable energy
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Technology	Cost

Environmental impacts	Safety concerns

Fourth energy source
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What is being done to make it produce more usable energy

Technology

Cost

Environmental impacts

Safety concerns

Fifth energy source

What is being done to make it produce more usable energy



Technology	Cost
Environmental impacts	Safety concerns

**REQUIREMENT 8:** Find out what opportunities are available for a career in energy. Choose one position that interests you and describe the education and training required.

Opportunities that are available for a career in energy
Education and training required for one position