



# ENERGY

## BYU Merit Badge PowWow

### Official Merit Badge Worksheet

Scout's Name

Instructor's Name

Scout's Address

City

State

ZIP

#### General Instructions

- 1) The Scout is to review the merit badge book before the first Saturday of PowWow.
- 2) Bring this work sheet, paper, and pen or pencil each week.
- 3) **Bring a Merit Badge blue card with you on the second week.**

#### Requirement Instructions\*

- 1) Requirements 1, 4, and 6 should be completed **prior to PowWow** and should be brought to the first session of PowWow.
- 2) Requirements 2, 3, 5, 7, and 8 should be passed off during the two sessions of PowWow.

**\* Due to possible time constraints at the PowWow, certain requirements that were originally planned to be completed in class may need to be completed as homework. Please LISTEN to ALL INSTRUCTIONS in class to be aware of any changes.**

#### Requirement 1

**Initial**

Find an article on the use or conservation of energy.

Name of Article:

Reference:

What in the article was interesting?

What are questions the article raises?

What ideas does the article address that you do not understand?

After you have completed requirements 2–8, revisit the article you chose. Explain what you have learned in completing the requirements that help you better understand the article.

#### Requirement 2

**Initial**

Explain how three of the following devices use energy and explain their energy conversions.

Toaster:

Energy Conversion:

Greenhouse:

Energy Conversion:

Lightbulb:

Energy Conversion:

Bow Drill:

Energy Conversion:

Nuclear Reactor:

Energy Conversion:

Sweat Lodge:

Energy Conversion:

Construct a system that makes at least two energy conversions.

Explain your system.

Energy Conversion:

Energy Conversion:

### **Requirement 3**

**Initial**

Show you understand energy efficiency by explaining a common example of a situation where energy moves through a system to produce a useful result.

Identify the parts of the system that are affected by the energy movement.

Name the system's primary source of energy.

Identify the useful outcomes of the system.

Identify the energy losses of the system.

### **Requirement 4**

**Initial**

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.

- 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.

Energy use:

-OR-

Transportation Fuel:

How is it delivered?

Miles Driven:

How is it measured?

Miles per Gallon:

Energy used:

Trips:

How is it delivered?

How is it measured?

Energy used:

How is it delivered?

How is it measured?

- b. Describe ways you and your family can use energy resources more wisely. In preparing your discussion, consider the energy required for things you do on a daily basis (cooking, showering, using lights, driving, watching TV, using the computer).

Explain how you can change your energy use through reuse and recycling.

Use the following spaces to help you keep track of the day-to-day items that you and your family did to reduce energy use.

Day 1:

Day 2:

Day 3:

Day 4:

Day 5:

Day 6:

Day 7:

Day 8:

Day 9:

Day 10:

Day 11:

Day 12:

Day 13:

Day 14:

Summarize what you have learned over the two-week period. Tell what things you did that were most effective in saving energy.

## **Requirement 5**

**Initial**

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.

*Example 1:*

Suggestion for reducing waste:

*Example 2:*

Suggestion for reducing waste:

*Example 3:*

Suggestion for reducing waste:

*Example 4:*

Suggestion for reducing waste:

*Example 5:*

Suggestion for reducing waste:

Describe the idea of trade-offs in energy use.

Explain how the changes you suggest would lower costs, reduce pollution, or otherwise improve your community.

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**

**Initial**

Prepare pie charts for each of the following and explain the important ideas each chart reveals. Tell where you got your information.

The energy resources that supply the United States with most of its energy:

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

The proportion of energy resources used by homes, businesses, industry, and transportation:

The fuels used to generate America's electricity:

The world's known and estimated primary energy resource reserves:

Explain how cost affects the use of a nonrenewable energy resource.

Explain how cost makes alternatives practical.

**Requirement 7**

**Initial**

Tell what is being done to make FIVE of the following energy systems produce more usable energy. In each 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 plants:

Tidal energy, wave energy, or ocean thermal energy conversion devices:

Wind turbines:

## **Requirement 8**

**Initial**

Find out what opportunities are available for a career in energy:

Choose one position that interests you and describe the education and training involved.

**Merit badge work sheets will not be accepted at the Council Office in place of the official Merit Badge Application Card. Those who do not complete all the requirements should take their partially completed merit badge work sheet and their official application card to their local merit badge counselors for completion.**

You've registered for one of these Hornaday merit badges at this PowWow and are invited to attend a special session immediately following each day of PowWow classes on how to make your Eagle Project count for a Hornaday Badge, as well. Please join us in CB 256, just off of the registration area, from 12:30-1:30 pm.