ENGINEERING
GRAND TETON COUNCIL
Merit Badge PowWow Worksheet

Scout's Name **Instructor's Name**

Scout's Address **City** **State** **ZIP**

Instructions

1) The Scout is to review the merit badge book before the first week 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) Requirement 4 should be completed **prior to the first session of PowWow,**
2) Requirements 1, 3, 5, 6, 7, 8, and 9 should be passed off during the two sessions of PowWow.
3) Requirement 2 must be completed as **homework** between 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

Select a manufactured item in your home (such as a toy or an appliance) and, under adult supervision and with the approval of your counselor, investigate how and why it works as it does.

What manufactured item did you select?

Describe how and why it works as it does.

What kinds of engineering activities were needed to create this object?

Discuss with your counselor what you learned and how you got the information.

Requirement 2 Initial

Select an engineering achievement that has had a major impact on society.

What engineering achievement did you select?

Use resources such as the Internet (with your parent's permission), books, and magazines. Give a brief summary of what you found while researching it.

Tell about the engineer(s) who made it possible.

Describe any special obstacles they had to overcome.

Tell how this achievement has influenced the world today.

Requirement 3 **Initial**

Explain the work of six types of engineers.

Type: Description:

Type: Description:

Type: Description:

Type: Description:

Type: Description:

Type: Description:

Pick two of the six:

Type 1: Type 2:

How is their work related?

Requirement 4 **Initial**

Visit with an engineer (who may be your counselor or parent) and do the following:

Discuss what this engineer does and the tools the engineer uses. Report what you learned.

Discuss with the engineer a current project and the engineer's particular role in it. Report what you learned.

Find out how the engineer's work is done and how results are achieved. Report what you learned.

Ask to see the reports that the engineer writes concerning the project. Describe what you saw.

Write below what you learned about engineering from this visit and discuss it with your counselor.

Requirement 5 **Initial**

You have been given two options for this requirement. Select and complete ONE of them.

Option 1:

a. Use the systems engineering approach to make step-by-step plans for your next campout. Attach it to this sheet or write on the back of this page.

List alternative ideas on such items as:
Program schedule:

Campsites:

Transportation:

Costs:

Tell why you made the choices you did and what improvements were made.

Option 2:

b. Make an original design for a piece of patrol equipment. Use the systems engineering approach to help you decide how it should work and look. Draw plans for it on another piece of paper and attach it to this work sheet.

Explain why you designed it the way you did, and explain how you would make it.

Requirement 6 **Initial**

You have been given seven options for this requirement. Select and complete TWO of them.

Option 1:

Transforming Motion: Using common materials or a construction set, make a simple model that will demonstrate motion.

Describe your model.

Explain how the model uses basic mechanical concepts such as levers and inclined planes to demonstrate motion.

Describe an example where this mechanism is used in a real product.

Option 2:

Using Electricity: Make a list of 10 electrical appliances in your home. Find out approximately how much electricity each uses in one month.

Item:	Approximate amount of energy used per month:
Item:	Approximate amount of energy used per month:
Item:	Approximate amount of energy used per month:
Item:	Approximate amount of energy used per month:
Item:	Approximate amount of energy used per month:
Item:	Approximate amount of energy used per month:
Item:	Approximate amount of energy used per month:
Item:	Approximate amount of energy used per month:
Item:	Approximate amount of energy used per month:
Item:	Approximate amount of energy used per month:

Tell how to find out the amount and cost of electricity used in your home during light and heavy use.

Tell five ways to conserve electricity.

1.
2.
3.
4.
5.

Option 3:

Understanding electronics: Using an electronic device such as a mobile telephone or portable digital media player, find out how sound travels from one location to another.

Explain how the device was designed for ease of use, function, and durability.

Option 4:

Using materials: Do experiments to show the differences in strength and heat conductivity in wood, metal, and plastic. Give a brief summary of the experiments you did.

Discuss what you have learned with your counselor.

Option 5:

Converting energy: Do an experiment to show how mechanical, heat, chemical, solar, and/or electrical energy may be converted from one or more types of energy to another. Explain your experiment and the results.

Describe to your counselor what energy is and how energy is converted and used in your surroundings.

Option 6:

Moving people: Find out the different ways people in your community get to work.

Make a study of traffic flow (number of vehicles and relative speed) in both heavy and light traffic periods. Give a summary of your study.

Discuss what might be improved to make it easier for people in your community to get where they need to go.

Option 7:

Building an engineering project: Enter a project in a science or engineering fair or similar competition. (This requirement may be met by participation on an engineering competition project team.) Tell about your project.

Discuss what your project demonstrates.

What kinds of questions did visitors to the fair ask you about your project?

How well were you able to answer their questions?

Requirement 7 **Initial**

Explain what it means to be a registered Professional Engineer (P.E.).

Name the types of engineering work for which registration is most important.

Requirement 8 **Initial**

Study the Engineer's Code of Ethics. Explain how it is like the Scout Oath and Scout Law.

Requirement 9 **Initial**

Find out about three career opportunities in engineering. Pick one and research the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.

Career One:

Career Two:

Career Three:

Chosen Career:

Education:

Training:

Experience:

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.