



Engineering

Merit Badge Workbook

This workbook can help you but you still need to read the merit badge pamphlet (book). No one can add or subtract from the Boy Scout Requirements #33215. Merit Badge Workbooks and much more are below: [Online Resources](#).

Workbook developer: craig@craiglincoln.com. Requirements revised: 2001, Workbook updated: April 2008.

Scout's Name: _____ Unit: _____

Counselor's Name: _____ Counselor's Ph #: _____

1. Select some 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. _____

Find out what sort of engineering activities were needed to create it. _____

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

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

Use the resources available to you to research it. Tell your counselor about the engineer(s) who made it possible, _____

the special obstacles they had to overcome, _____

and how this achievement has influenced the world today. _____

3. Explain the work of six types of engineers.

Pick two of the six and explain how their work is related.

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

a. Discuss the work this engineer does _____

and the tools the engineer uses. _____

b. Discuss with the engineer a current project _____

and the engineer's particular role in it. _____

c. Find out how the engineer's work is done _____

and how results are achieved. _____

d. Ask to see the reports that the engineer writes concerning the project.

e. Discuss with your counselor what you learned about engineering from this visit. _____

5. Do ONE of the following:

a. Use the engineering-systems approach to make step by step plans for your next campout. _____

List alternative ideas for such items as program schedule, _____

campsites, _____

transportation, _____

and costs. _____

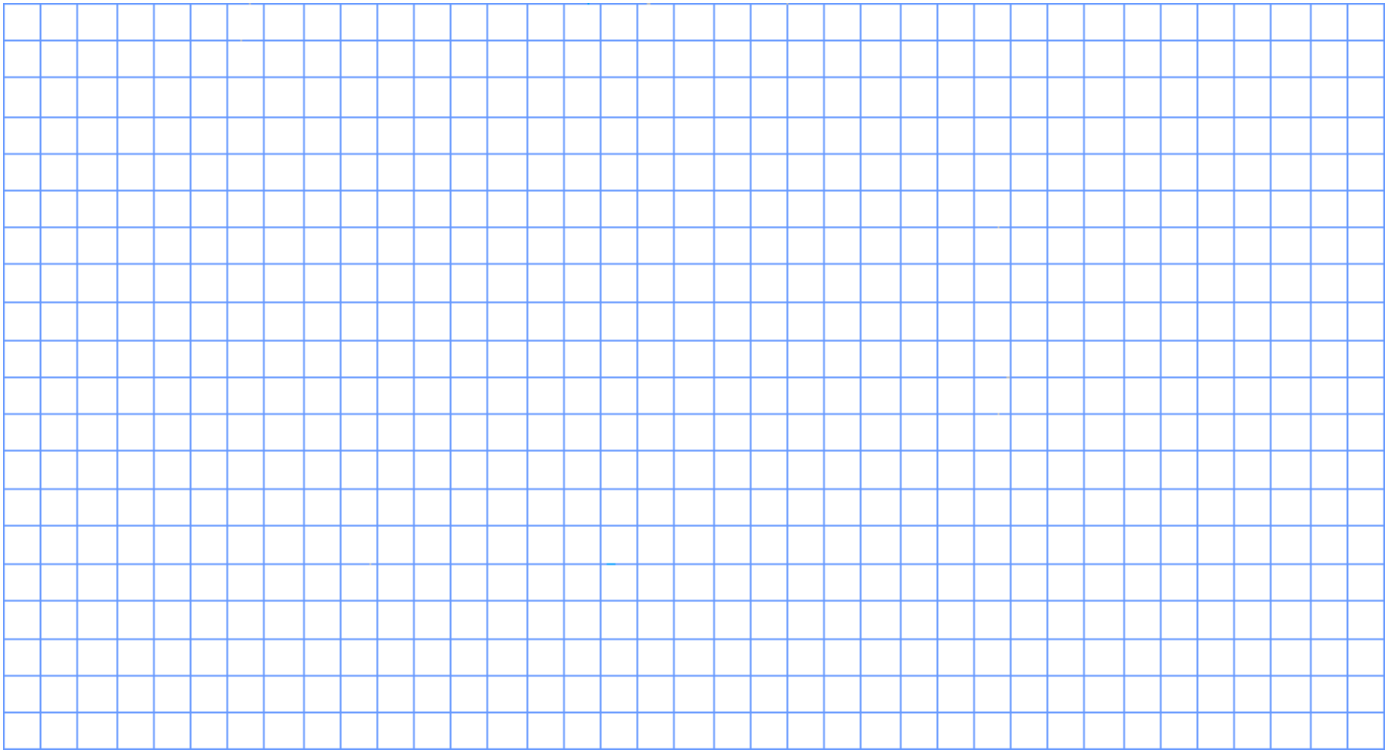
Tell why you made the choices you did _____

and what improvements were made. _____

b. Make an original design for a piece of patrol equipment. _____

Use the engineering-systems approach to help you decide how it should work and look. _____

Draw plans for it.



Show the plans to your counselor, explain why you designed it the way you did, _____

and explain how you would make it. _____

6. Do TWO of the following:

- a. Transforming motion. Using common material or a construction set, makes a simple model that will demonstrate transforming motion. How does this make use of basic mechanical concepts like levers and inclined planes? Describe an example where this mechanism is used in a real product.
- b. Using electricity. Make a list of 10 electrical appliances in your home. Find out approximately how much electricity each uses in one month. Learn how to find out the amount and cost of electricity used in your home during periods of light and heavy use. List five ways to conserve electricity.

In what types of engineering work is registration most important? _____

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

Online Resources *(Use any Internet resource with caution and only with your parent's or guardian's permission.)*

Boy Scouts of America: ▶ scouting.org ▶ [Guide to Safe Scouting](#) ▶ [Age-Appropriate Guidelines](#) ▶ [Safe Swim Defense](#)
▶ [Scout](#) ▶ [Tenderfoot](#) ▶ [Second Class](#) ▶ [First Class](#) ▶ [Rank Videos](#) ▶ [Safety Afloat](#)

Boy Scout Merit Badge Workbooks: usscouts.org -or- meritbadge.org **Merit Badge Books:** www.scoutstuff.org

Amer. Institute of Chemical Eng.: <http://www.aiche.org>

Amer. Soc. of Civil Eng.: <http://www.asce.org>

ASME (Amer. Soc. of Mechanical Eng.): <http://www.asme.org>

Institute of Electrical and Electronics Eng.: <http://www.ieee.org>

Jet Propulsion Laboratory: <http://www.jpl.nasa.gov>

Junior Engineering Technical Soc.: <http://www.jets.org>

Kennedy Space Center: <http://www.ksc.nasa.gov>

Nat. Action Council for Minorities: <http://www.nacme.org>

National Aeronautics and Space Administration: <http://www.nasa.gov>

Smithsonian National Air and Space Museum: <http://www.nasm.si.edu>

National Society of Black Engineers: <http://www.nsbe.org>

National Society of Professional Eng.: <http://www.nspe.org>

Soc. of Hispanic Professional Eng.: <http://www.shpe.org>

Soc. of Manufacturing Eng.: <http://www.sme.org>

Soc. of Petroleum Eng.: <http://www.spe.org>