



This workbook is not required but can help you with this award. Belt Loops and Pins may be earned more than once.

Send comments to the workbook developer: [craig@craiglincoln.com](mailto:craig@craiglincoln.com). Workbook updated: May 2009.

1. Talk to an engineer, surveyor, or architect in your area about the Different occupations in engineering. Create a list that tells what they do.

2. Draw a floor plan of your house. Include doors, windows, and stairways.

This image shows a full page of blank graph paper. The grid consists of small, uniform squares formed by thin, light blue horizontal and vertical lines. There are no margins, text, or other markings on the page.

**And do four of these:**

- ☐ 3. Visit a construction job. \_\_\_\_\_

Look at a set of plans used to build the facility or product. Tell your Webelos den leader about these. (Get permission before you visit.) \_\_\_\_\_

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- ☐ 4. Visit a civil engineer or surveyor to learn how to measure the length of a property line. \_\_\_\_\_

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Explain how property lines are determined. \_\_\_\_\_

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- ☐ 5. Tell about how electricity is generated \_\_\_\_\_

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and then gets to your home. \_\_\_\_\_

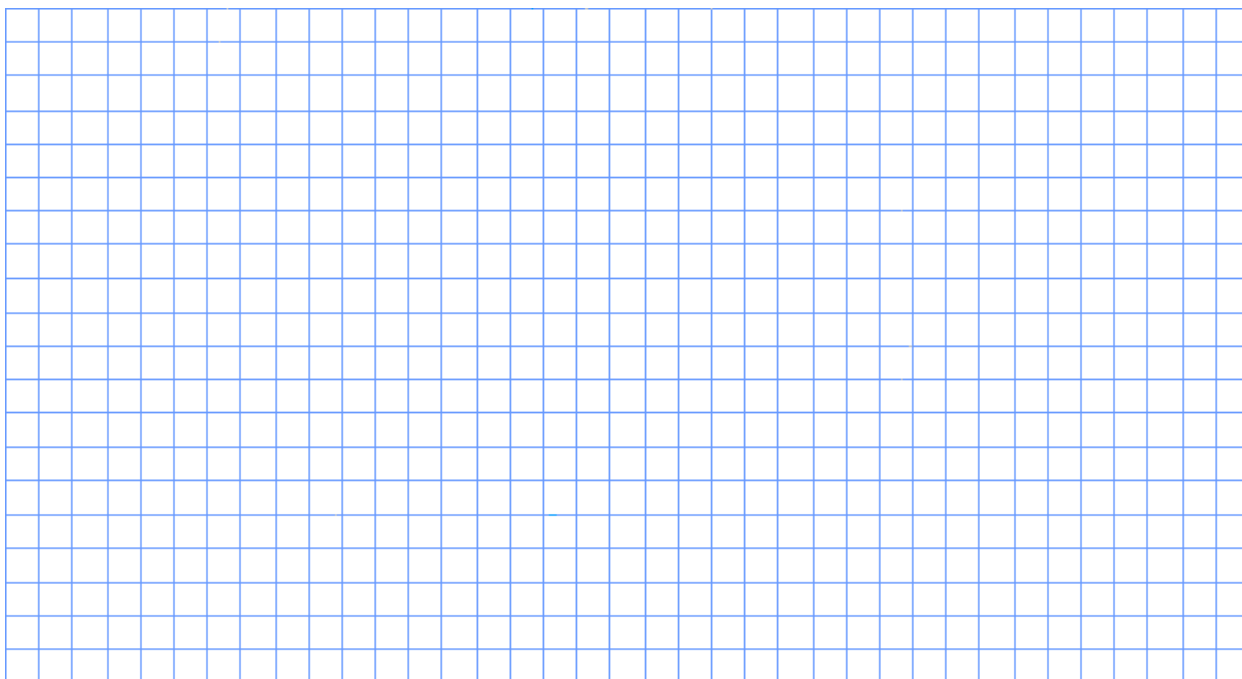
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- ☐ 6. Construct a simple working electrical circuit using a flashlight battery, a switch, and a light. \_\_\_\_\_

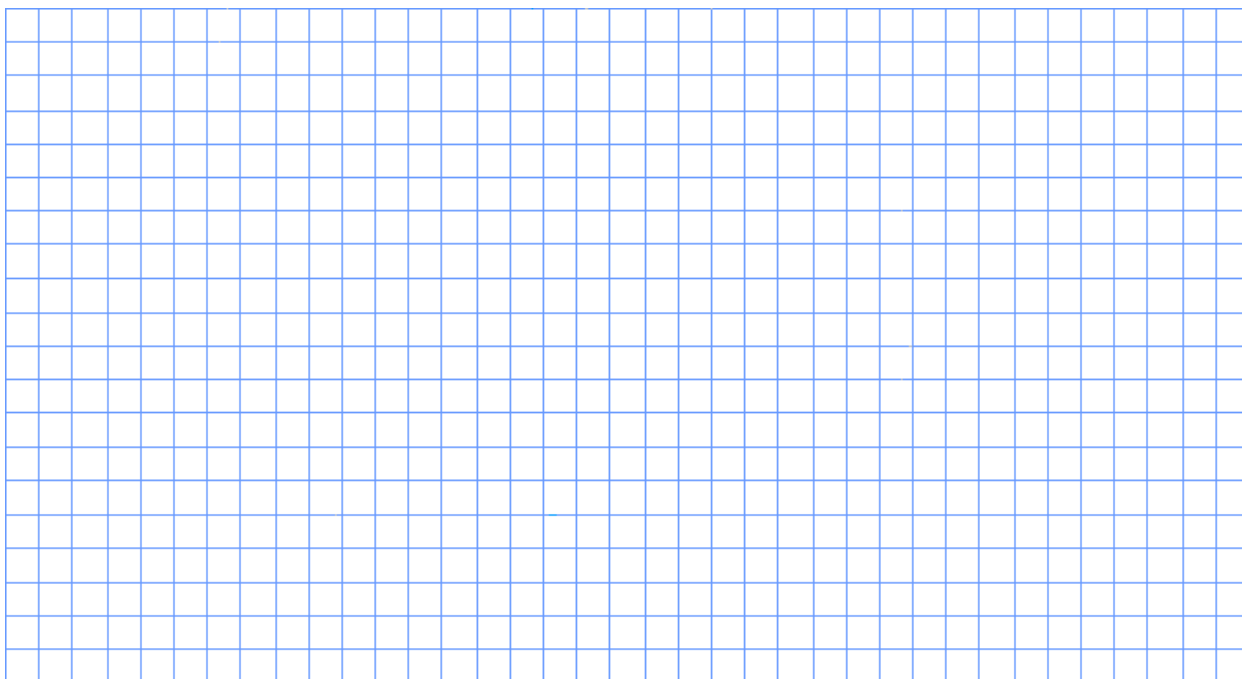
☐ 7. Make drawings of three kinds of bridges and explain their differences. Construct a model bridge of your choice.



**Bridge Type:** \_\_\_\_\_

**Differences** \_\_\_\_\_

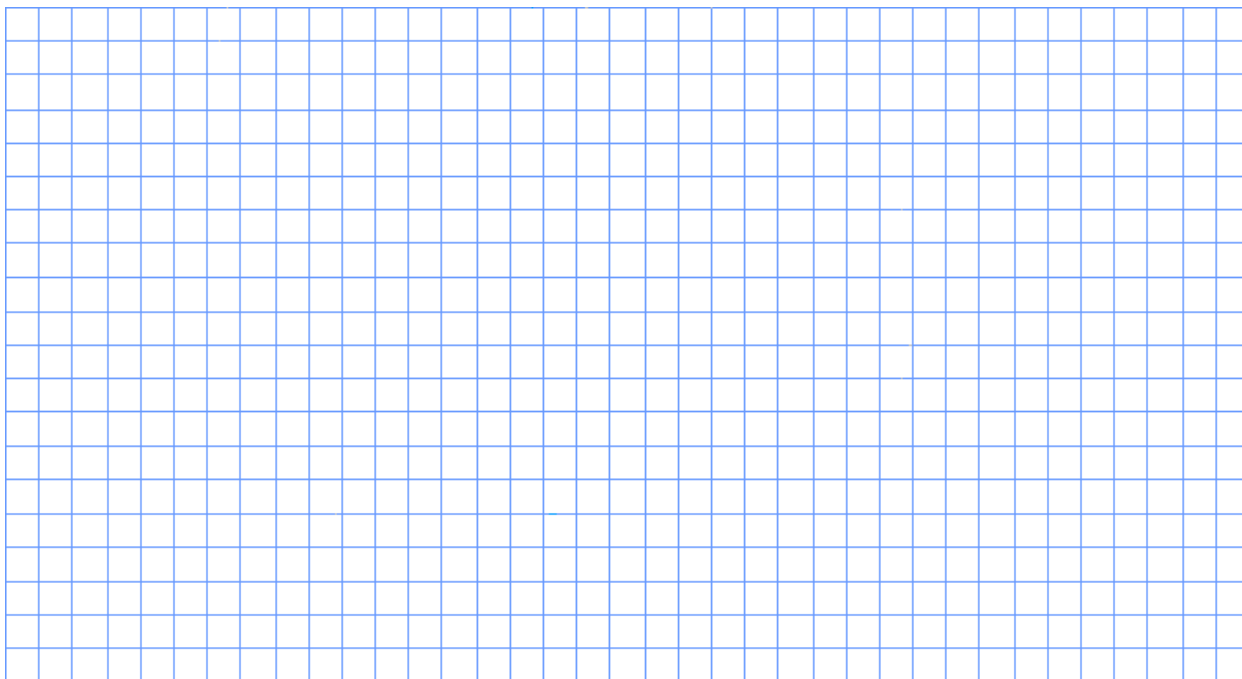
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**Bridge Type:** \_\_\_\_\_

**Differences** \_\_\_\_\_

\_\_\_\_\_  
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**Bridge Type:** \_\_\_\_\_

**Differences** \_\_\_\_\_

☐ 8. Make a simple crane using a block and tackle and explain how the block and tackle is used in everyday life. \_\_\_\_\_

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☐ 9. Build a catapult and show how it works. \_\_\_\_\_

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☐ 10. While you are a Webelos Scout, earn the Cub Scout Academics belt loop for Mathematics. *(All boys may earn belt loops and pins more than once...Cub Scout Academics and Sports Program Guide p. 4)* \_\_\_\_\_

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

**Engineer** is helping to prepare you for [Engineering](#), [Architecture](#), [Electricity](#), and [Surveying](#) Merit Badges.

**Webelos Activity Badge Workbooks:** [meritbadge.org](#) -or- [usscouts.org](#)

**Cub Scout Academics and Sports Workbooks:** [meritbadge.org](#) -or- [Academics](#) / [Sports](#)

**Resources:** ► [scouting.org](#) ► [Guide to Safe Scouting](#) ► [Age-Appropriate Guidelines](#) ► [Safe Swim Defense](#)

**Boy Scout Merit Badge Workbooks:** [meritbadge.org](#) -or- [usscouts.org](#) **Merit Badge Books:** [www.scoutstuff.org](#)

### Requirement Resources

These resources and much more are at: <http://meritbadge.org/wiki/index.php/Engineer>

1. [Careers in Engineering](#) - [Discover Engineering](#) - [About.com Engineering Careers](#) - [Fields \(Type\) of Engineering](#) - p. 213
2. Graph paper to draw your floor plan is in the [Engineer Worksheet](#) - [How to draw a Scale Floor Plan](#) - p. 214
3. Visit a construction job. Look at a set of plans - p. 215  
[How to Read Blueprints \(with symbols\)](#) - [How to Read Blueprints One-Page PDF](#) - [Video: How to Read Blueprints](#)
4. Visit a civil engineer or surveyor to learn how to measure the length of a property line - p. 215  
[Video: How to Identify Property Lines](#) - [How to Determine your Property Lines \(with sample land plats\)](#) - [eHow: Understand Your Home's Property Survey](#) [[http://www.wsls.org/water\\_files/PLATSOFSURVEYS/plat-of-survey-john-doe.jpg](http://www.wsls.org/water_files/PLATSOFSURVEYS/plat-of-survey-john-doe.jpg) Sample Plat of Survey] -  
See [Surveying](#) merit badge for more.
5. Electricity generation & transmission - p. 216  
[How Electricity Works](#) - [What is Electricity?](#)
6. Construct a simple working electrical circuit using a flashlight battery, a switch, and a light - p. 216  
[How to Make a Simple Electrical Circuit](#) - [Electrical Circuit Lesson Plan](#) -
7. Graph paper to draw your bridges is in the [Engineer Worksheet](#) - p. 218-20  
[Nova: What Bridge To Build?](#) - [File Card Bridges](#) - [Bridge Building Links](#)
8. Crane using a block and tackle - pp. 221-3  
[How Stuff Works](#) - [How a Block and Tackle Works \(animated\)](#)
9. Build a catapult and show how it works - pp. 224-5  
[Simple Lego & Dowel Catapults](#) - [Video: How to Build a Catapult](#) - [How to Build a Simple Catapult](#)  
- [How does a catapult work?](#)
10. [Cub Scout Academics belt loop for Mathematics](#)

*" Many Webelos Scouts may earn belt loops and pins a second time to qualify for [Webelos Activity Badges](#). All boys may earn belt loops more than once; however, leaders should encourage boys to try different requirements and earn the pin. Packs should have a clear policy in place to determine whether the pack or the boy's family will be responsible for the cost of awards that are earned more than once.*

— [Cub Scout Academics and Sports Program Guide #34299B](#), p.4 and [Cub Scout Leader Book](#), p. 31-1.

### General Resources

[CubRoundtable: Engineer 24 page reference guide- 302KB\)](#)

[Bill Smith's Webelos Leader Resources: Engineer](#)

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

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

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

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

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

[KISMIF: Engineer Links](#)

[Webelos Roundtable Packet: Engineer](#)

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

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

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

NASA: <http://www.nasa.gov>