



Drafting

Merit Badge Workbook



This workbook can help you but you still need to read the merit badge pamphlet.

The work space provided for each requirement should be used by the Scout to make notes for discussing the item with his counselor, not for providing the full and complete answers. Each Scout must do each requirement.

No one may add or subtract from the official requirements found in **Boy Scout Requirements** (Pub. 33216 – SKU 34765).

The requirements were last issued or revised in 2009 • This workbook was updated in January 2014.

Scout's Name: _____

Unit: _____

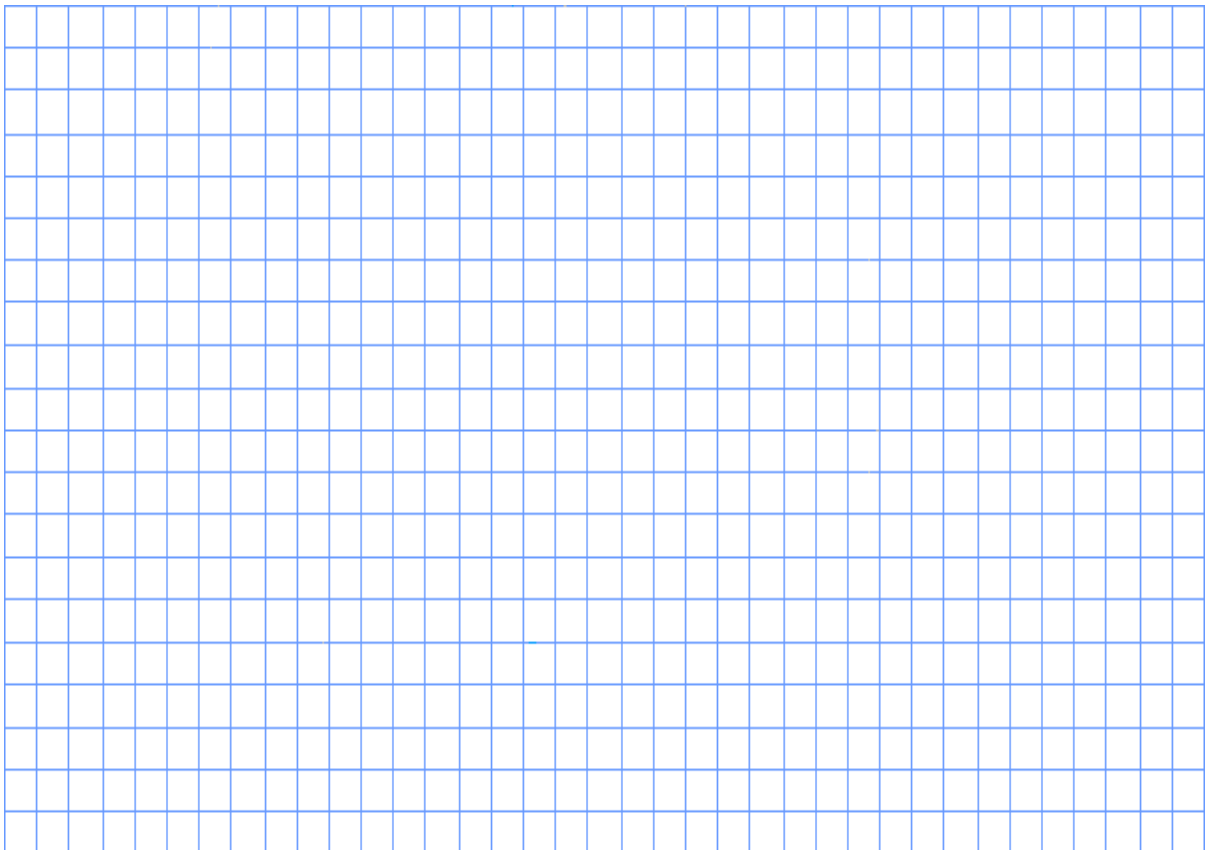
Counselor's Name: _____

Counselor's Phone No.: _____

<http://www.USScouts.Org> • <http://www.MeritBadge.Org>

Please submit errors, omissions, comments or suggestions about this **workbook** to: Workbooks@USScouts.Org
Comments or suggestions for changes to the **requirements** for the **merit badge** should be sent to: Merit.Badge@Scouting.Org

- ☐ 1. Format TWO sheets of drawing paper with proper borders and title blocks - one for your manual project (see requirement 2) and one for your lettering project (see requirement 5).
- a. Make a rough sketch of your project drawings to determine the correct size of paper to format.



- ☐ b. Using either single-stroke vertical or slant Gothic lettering, fill in all important information in the title block sections of the formatted paper.
- ☐ 2. Using the formatted sheet of paper you prepared for your manual project, produce a pencil drawing as it would be used for manufacturing.
- ☐ Fill in all title block information.

The manual drawing may be any one of the following drawing types:

- ☐ a. **Architectural:** Make a scale drawing of an architectural project. The architectural drawing may be a floor plan, electrical, plumbing, or mechanical service plan; elevation plan; or landscaping plan. Use an architect's scale and show dimensions to communicate the actual size of features. Include any important notes and considerations necessary for construction.
 - ☐ b. **Mechanical:** Make a scale drawing of some mechanical device or interesting object. The mechanical drawing may be of the orthographic or isometric style. Use an engineer's scale and show dimensions to communicate the actual size of features. Include any important notes and considerations necessary for construction.
 - ☐ c. **Electrical:** Draw a simple schematic of a radio or electronic circuit. Properly print a bill of materials including all of the major electrical components used in the circuit. Use standard drawing symbols for the electronic components.
- ☐ 3. Produce a computer-aided design (CAD) drawing as it would be used in manufacturing. Fill in all title block information. The CAD drawing may be any one of the following drawing types:
- ☐ a. **Architectural:** Make a scale drawing of an architectural project. The architectural drawing may be a floor plan, electrical, plumbing, or mechanical service plan; elevation plan; or landscaping plan. Use an architect's scale and show dimensions to communicate the actual size of features. Include any important notes and considerations necessary for construction.
 - ☐ b. **Mechanical:** Make a scale drawing of some mechanical device or interesting object. The mechanical drawing may be of the orthographic or isometric style. Use an engineer's scale and show dimensions to communicate the actual size of features. Include any important notes and considerations necessary for construction.
 - ☐ c. **Electrical:** Draw a simple schematic of a radio or electronic circuit. Properly print a bill of materials including all of the major electrical components used in the circuit. Use standard drawing symbols for the electronic components.
4. Discuss with your counselor how fulfilling requirements 2 and 3 differed from each other.

Tell about the benefits derived from using CAD for requirement 3.

Include in your discussion the software you used as well as other software options that are available.

- ☐ 5. Using single-stroke slant or vertical Gothic lettering, (without the aid of a template or lettering guide) write a brief explanation of what you consider to be the most important benefit in using CAD in a particular industry (aerospace, electronics, manufacturing, architectural, or other). Use the experience gained in fulfilling requirements 2, 3, and 4 to support your opinion. Use the formatted sheet of paper you prepared in requirement 1 for your lettering project.
6. Do ONE of the following (a or b):
- ☐ a. Visit a facility or industry workplace where drafting is part of the business. Ask to see an example of the work that is done there, the different drafting facilities, and the tools used.
- ☐ 1. Find out how much of the drafting done there is manual, and how much is done using CAD. If CAD is used, find out what software is used and how and why it was chosen.

- ☐ 2. Ask about the drafting services provided.

Ask who uses the designs produced and how those designs are used.

Discuss how the professionals who perform drafting cooperate with other individuals in the drafting area and other areas of the business.

- ☐ 3. Ask how important the role of drafting is to producing the end product or service that this business supplies.

Find out how drafting contributes to the company's end product or service

- ☐ b. Using resources you find on your own such as at the library and on the Internet (with your parent's permission), learn more about the drafting trade and discuss the following with your counselor.

1. The drafting tools used in the past - why and how they were used. Explain which tools are still used today and how their use has changed with the advent of new tools. Discuss which tools are being made obsolete by newer tools in the industry.

2. Tell what media types were used in the past and how drawings were used, stored, and reproduced. Tell how the advent of CAD has changed the media used, and discuss how these changes affect the storage or reproduction of drawings.

3. Discuss whether the types of media have changed such that there are new uses for the drawings, or other outputs, produced by designers.

Briefly discuss how new media types are used in the industry today.

7. Find out about three career opportunities in drafting.

1.	
2.	
3.	

Pick one and find out about the education, training, and experience required for this profession.

Career:	
Education:	
Training:	
Experience:	

Discuss this with your counselor, and explain why this profession might interest you.

Requirement resources can be found here:
http://www.meritbadge.org/wiki/index.php/Drafting#Requirement_resources

Important excerpts from the [Guide To Advancement - 2013](#), No. 33088 (SKU-618673)

[1.0.0.0] — Introduction

The current edition of the *Guide to Advancement* is the official source for administering advancement in all Boy Scouts of America programs: Cub Scouting, Boy Scouting, Varsity Scouting, Venturing, and Sea Scouts. It replaces any previous BSA advancement manuals, including *Advancement Committee Policies and Procedures*, *Advancement and Recognition Policies and Procedures*, and previous editions of the *Guide to Advancement*.

[Page 2, and 5.0.1.4] — Policy on Unauthorized Changes to Advancement Program

No council, committee, district, unit, or individual has the authority to add to, or subtract from, advancement requirements. There are limited exceptions relating only to youth members with special needs. For details see section 10, "Advancement for Members With Special Needs".

[Page 2] — The "Guide to Safe Scouting" Applies

Policies and procedures outlined in the *Guide to Safe Scouting*, No. 34416, apply to all BSA activities, including those related to advancement and Eagle Scout service projects.

[7.0.3.1] — The Buddy System and Certifying Completion

A youth member must not meet one-on-one with an adult. Sessions with counselors must take place where others can view the interaction, or the Scout must have a buddy: a friend, parent, guardian, brother, sister, or other relative—or better yet, another Scout working on the same badge—along with him attending the session.

When the Scout meets with the counselor, he should bring any required projects. If these cannot be transported, he should present evidence, such as photographs or adult verification. His unit leader, for example, might state that a satisfactory bridge or tower has been built for the Pioneering merit badge, or that meals were prepared for Cooking. If there are questions that requirements were met, a counselor may confirm with adults involved. Once satisfied, the counselor signs the blue card using the date upon which the Scout completed the requirements, or in the case of partials, initials the individual requirements passed.

Note that from time to time, it may be appropriate for a requirement that has been met for one badge to also count for another. See "Fulfilling More Than One Requirement With a Single Activity," 4.2.3.6.

[7.0.3.2] — Group Instruction

It is acceptable—and sometimes desirable—for merit badges to be taught in group settings. This often occurs at camp and merit badge midways or similar events. Interactive group discussions can support learning. The method can also be attractive to "guest experts" assisting registered and approved counselors. Slide shows, skits, demonstrations, panels, and various other techniques can also be employed, but as any teacher can attest, not everyone will learn all the material.

There must be attention to each individual's projects and his fulfillment of *all* requirements. We must know that every Scout—actually and *personally*—completed them. If, for example, a requirement uses words like "show," "demonstrate," or "discuss," then every Scout must do that. It is unacceptable to award badges on the basis of sitting in classrooms *watching* demonstrations, or remaining silent during discussions.

It is sometimes reported that Scouts who have received merit badges through group instructional settings have not fulfilled all the requirements. To offer a quality merit badge program, council and district advancement committees should ensure the following are in place for all group instructional events.

- Merit badge counselors are known to be registered and approved.
- Any guest experts or guest speakers, or others assisting who are not registered and approved as merit badge counselors, do not accept the responsibilities of, or behave as, merit badge counselors, either at a group instructional event or at any other time. Their service is temporary, not ongoing.
- Counselors agree not to assume prerequisites have been completed without some level of evidence that the work has been done. Pictures and letters from other merit badge counselors or unit leaders are the best form of prerequisite documentation when the actual work done cannot be brought to the camp or site of the merit badge event.
- There is a mechanism for unit leaders or others to report concerns to a council advancement committee on summer camp merit badge programs, group instructional events, and any other merit badge counseling issues—especially in instances where it is believed BSA procedures are not followed. See "Reporting Merit Badge Counseling Concerns," 11.1.0.0.
- There must be attention to each individual's projects and his fulfillment of all requirements. We must know that every Scout—actually and personally—completed them.

[7.0.3.3] — Partial Completions

A Scout need not pass all the requirements of one merit badge with the same counselor. It may be that due to timing or location issues, etc., he must meet with a different counselor to finish the badge. The Application for Merit Badge has a place to record what has been finished—a "partial." In the center section on the reverse of the blue card, the counselor initials for each requirement passed. In the case of a partial completion, the counselor does not retain his or her portion of the card. A subsequent counselor may choose not to accept partial work, but this should be rare. A Scout, if he believes he is being treated unfairly, may work with his unit leader to find another counselor. An example for the use of a signed partial would be to take it to camp as proof of prerequisites. Partials have no expiration except the Scout's 18th birthday. Units, districts, or councils shall not establish other expiration dates for partial merit badges.

[7.0.4.8] — Unofficial Worksheets and Learning Aids

Worksheets and other materials that may be of assistance in earning merit badges are available from a variety of places including unofficial sources on the Internet and even troop libraries. Use of these aids is permissible as long as the materials can be correlated with the current requirements that Scouts must fulfill. Completing "worksheets" may suffice where a requirement calls for something in writing, but this would not work for a requirement where the Scout must discuss, tell, show, or demonstrate, etc. Note that Scouts shall not be required to use these learning aids in order to complete a merit badge.