



Drafting

Scouts BSA · Trades

Name

Started

Completed

Drafting is the language engineers, architects, and builders use to share ideas. You'll make drawings by hand and on a computer, learn how professionals review and correct their work, and see how drafting is used in real jobs.

Requirements

Every official requirement, in plain language. Check the official wording when you sign off (scouting.org/merit-badges/drafting/). Tips and examples are ideas, not extra requirements.

- ☐ **1** Set up two drawing sheets, each with a proper border and title block: one for your hand-drawn project (requirement 2), the other for your hand-lettering project (requirement 6)

Tip: Use a ruler and a sharp pencil to set up clean borders and a title block. Neat setup makes the rest of your drawing easier.

Example: Each sheet gets a border about half an inch in from the edge and a title block in the lower right corner with the drawing title, your name, the date, the scale, and the sheet number.

- ☐ **1a** Sketch each project drawing roughly first to figure out what paper size to format

- ☐ **1b** Fill in all key title block information using single-stroke vertical or slanted Gothic lettering

- ☐ **2** On the sheet you formatted for your manual project, make a pencil drawing fit for manufacturing and complete the title block, choosing one of these drawing types (choose 1 of 3 below)

Tip: Pick a simple object, like a wooden block or a bracket, and measure it carefully before you start drawing.

Example: Draw a shelf bracket in three views: front, top, and side, lined up with each other. Add dimensions in inches, a hole size with a note like "2X 1/4 DIA THRU," and the material in the title block.

- ☐ **2a** Architectural: make a scale drawing of a floor plan, an elevation, a landscaping plan, or a plumbing, electrical, or mechanical service plan. Dimension true sizes with an architect's scale, add key section views, notes, and building details, and neatly print a bill of materials for 3+ materials or parts

- ☐ **2b** Mechanical: make a scale drawing of a mechanical device or other interesting object, in isometric or orthographic (third-angle) views. Dimension true sizes with an engineer's scale, add key section views, notes, and manufacturing details, and neatly print a bill of materials for 3+ materials or parts

- ☐ **2c** Electrical: draw the schematic of a simple electronic or radio circuit using standard symbols for its components, and neatly print a bill of materials listing all major electrical parts

- ☐ **3** Make a computer-aided design (CAD) drawing fit for manufacturing and complete the title block, choosing one of these drawing types (choose 1 of 3 below)

Tip: Try a free CAD program and follow a beginner tutorial first. Then draw something you can hold in your hand.

- ☐ **3a** Architectural: make a scale drawing of a floor plan, an elevation, a landscaping plan, or a plumbing, electrical, or mechanical service plan. Dimension true sizes with an architect's scale, and add key section views, notes, and building details

- ☐ **3b** Mechanical: make a scale drawing of a mechanical device or other interesting object, in isometric or orthographic (third-angle) views. Dimension true sizes with an engineer's scale, and add key section views, notes, and manufacturing details

- ☐ **3c** Electrical: draw the schematic of a simple electronic or radio circuit using standard symbols for its components, and neatly print a bill of materials listing all major electrical parts

4 Redline review and revision

Tips for this section: Your counselor will mark up your drawings with a change to make. Revising a drawing is a normal part of professional drafting.

Example for this section: In a redline review, your counselor might ask you to change a part's material from steel to aluminum, add a hole, or change a quantity in the bill of materials. Make the change, mark it on the drawing with a revision symbol (like a small triangle with a number), and record it in a revision block.

- ☐ **4a** Give your counselor copies (paper or digital) of the drawings you made for requirements 2 and 3; your counselor will return them redlined with a change to make, such as a feature, material, or bill of materials quantity

- ☐ **4b** Make the redlined correction, mark it on the drawings with a revision symbol, and add a revision block

- ☐ **5** Discuss with your counselor how requirements 2, 3, and 4 differed, the benefits of using CAD for requirements 3 and 4, the software you used, and other software choices

Tip: Jot down notes as you work on each drawing about what was easy, what was hard, and what took longer.

Example: Compare honestly: "By hand, I understood every line but erasing was slow. In CAD, changing one dimension updated everything, but I spent the first hour learning the menus."

- ☐ **6** On the sheet you set up in requirement 1, with no template or lettering guide, use single-stroke slanted or vertical Gothic lettering to explain briefly what you see as CAD's biggest benefit in one industry (aerospace, electronics, manufacturing, architecture, or another), drawing on requirements 2-5

Tip: Practice a few rows of each letter on graph paper before writing your explanation. Slow and steady keeps your lettering even.

Example: On the sheet you set up in requirement 1, write a short paragraph about how CAD helps one industry, like architecture, in single-stroke Gothic capitals between light guidelines, with letters about 1/8 inch tall and even spacing between words.

7 Drafting in the workplace: Choose 1 of 2

Tips for this section: Ask an engineering, architecture, or manufacturing office if you can see how they make drawings.

- ☐ **7a** Visit a business that uses drafting in its work, ask to see examples of what it produces, its drafting areas, and the tools used, and find out the following

- ☐ **7a1** How much drafting there is done by hand versus with CAD, and if CAD is used, which software and how and why it was picked

- ☐ **7a2** What drafting services are offered, who uses the designs and how; discuss how drafters work with others in the drafting area and elsewhere in the business

- ☐ **7a3** How important drafting is to the business's final product or service, and how it contributes to it

- ☐ **7b** Learn about the drafting trade using sources you find yourself, like the library or the internet (with a parent or guardian's permission), and discuss the following with your counselor

- ☐ **7b1** Drafting tools of the past and why and how they were used; which are still used and how that has changed with newer tools; and which are becoming obsolete

- ☐ **7b2** Media used in earlier times and how drawings were used, stored, and copied; how CAD has changed the media, and how that affects storing and copying drawings

- ☐ **7b3** Whether changes in media have created new uses for drawings and other design outputs, and briefly how new media are used in the industry today

- ☐ **8** Name three careers that use drafting skills; for one of them, research its training, education, certification, experience, and costs, plus job outlook, starting pay, and advancement; discuss with your counselor what you learned and whether the career interests you

Tip: Talk with someone who drafts for a living, or look up drafting jobs and the training they require.