

Programming

Merit Badge Workbook



Merit badges are earned by doing: reading the pamphlet, practicing the skills, and showing your counselor what you have learned.
This workbook gives you a place to organize your notes and track your progress along the way.
Merit badge counselors may not require the use of this or any similar workbook.
You still must satisfy your counselor that you can demonstrate each skill and have learned the information.
Use the space under each requirement to note what you have done and what you want to talk about, not to write out full answers.
When a requirement says discuss, show, tell, explain, or demonstrate, that is what you must do.
No one may add to or subtract from the official requirements found on scouting.org (Guide to Advancement 7.0.4.8).
Scouting America last updated this badge's requirements page on December 31, 2025.
Requirements change from time to time. Double-check scouting.org before you start.

Scout's name: _____ Unit: _____ Date started: _____

Counselor's name: _____ Phone no.: _____ Email: _____

Links marked "Scouting America resources" are the ones Scouting America shares on its official badge page.
Links marked "ScoutSmarts" open the matching part of Cole's guide. This workbook is unofficial and not endorsed by Scouting America.

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1. Safety. Do the following:

(a) View the Personal Safety Awareness "Digital Safety" video (with your parent or guardian's permission).
Scouting America resources: Scouting Digital Safety Video (video)

Date I watched it _____ Parent or guardian who gave permission _____

(b) Discuss first aid and prevention for the types of injuries that could occur during programming activities, including repetitive stress injuries and eyestrain.
Scouting America resources: Treating Repetitive Stress (video) · Treating Eye Strain (video) · 5 Tips to Reduce Eye Strain (website)
ScoutSmarts: Requirement 1b explained

Injuries that could happen while programming

Injury	Prevention	First aid
repetitive stress injuries		
eyestrain		

Other injuries that could occur, with prevention and first aid

Requirement 1 completed on _____ counselor initials _____

2. History. Discuss with your counselor the history of programming and the evolution of programming languages, including at least three milestones related to the advancement or development of programming over time.

Scouting America resources: 5 Minutes of Programming Language History (video) · Example With Code Examples and Pictures (PDF)
Text Descriptions of Historical Progression of Programming Languages (website)
Computer History Museum Timeline With Pictures (website) · History Handout (PDF) · **ScoutSmarts:** Requirement 2 explained

How programming and programming languages have evolved

Three milestones in programming

When	Milestone	Why it mattered

Requirement 2 completed on _____ counselor initials _____

3. General Knowledge. Do the following:

Scouting America resources: General Knowledge Handout (PDF)

(a) Create a list of five popular programming languages in use today and describe which industry or industries they are primarily used in and why.

Scouting America resources: Eight Popular Programming Languages, Their Industries and Coding Examples (PDF)
ScoutSmarts: Requirement 3a explained

Five popular programming languages in use today

Language	Industry or industries it is used in	Why it is used there

(b) Describe three different programmed devices you rely on every day.

ScoutSmarts: Requirement 3b explained

Three programmed devices I rely on every day

Device	What it does and how I rely on it

Requirement 3 completed on _____ counselor initials _____

4. Intellectual Property. Do the following:

Scouting America resources: Intellectual Property Handout (PDF)

(a) Explain the four types of intellectual property used to protect computer programs.

Scouting America resources: Four Different Types of Intellectual Property (PDF) · **ScoutSmarts:** Requirement 4a explained

Four types of intellectual property

Type	How it protects computer programs

(b) Describe the difference between licensing and owning software.

Scouting America resources: The Difference Between Licensing and Owning Software (PDF) · **ScoutSmarts:** Requirement 4b explained

The difference between licensing and owning software

(c) Describe the differences between freeware, open source, and commercial software, and why it is important to respect the terms of use of each.

Scouting America resources: Open Source VS Commercial Software (video) · Free VS Open Source Software (website)

ScoutSmarts: Requirement 4c explained

Kinds of software

Kind	What it is	Its terms of use
freeware		
open source		
commercial software		

Why it is important to respect the terms of use of each

Requirement 4 completed on _____ counselor initials _____

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5. Project. With your counselor's guidance, select three different programming languages and development environments. For each subrequirement below, do the following: Write or modify a program using the indicated programming language and development environment. The program must take input and produce output based on computations and decisions made on the input. Debug and demonstrate the program to your counselor. Explain how each program processes inputs, makes decisions based on those inputs, and provides outputs based on computations and decision making.

Scouting America resources: Project Handout (PDF)

(a) In the first language and environment, write or modify a program, debug and demonstrate, and explain as above.

Scouting America resources: Scout Life Programming Merit Badge (website) · **ScoutSmarts:** Requirement 5a explained

First programming language _____ Development environment _____

Wrote or modified? _____ Date demonstrated to my counselor _____

How my first program works

Part	My notes
What it does	
Inputs it takes	
Decisions it makes	
Computations and outputs	
Bugs I found and fixed	

(b) In the second language and environment, write or modify a program, debug and demonstrate, and explain as above.

Scouting America resources: Programming Merit Badge Welcome! From AutomationDirect (video) · **ScoutSmarts:** Requirement 5b explained

Second programming language _____ Development environment _____

Wrote or modified? _____ Date demonstrated to my counselor _____

How my second program works

Part	My notes
What it does	
Inputs it takes	
Decisions it makes	
Computations and outputs	
Bugs I found and fixed	

(c) In the third language and environment, write or modify a program, debug and demonstrate, and explain as above.
Scouting America resources: Codedex / Start Your Coding Adventure (website) · **ScoutSmarts:** Requirement 5c explained

Third programming language _____ Development environment _____

Wrote or modified? _____ Date demonstrated to my counselor _____

How my third program works

Part	My notes
What it does	
Inputs it takes	
Decisions it makes	
Computations and outputs	
Bugs I found and fixed	

Requirement 5 completed on _____ counselor initials _____

6. Careers. Do ONE of the following:
Scouting America resources: Careers Handout (PDF) · **ScoutSmarts:** Requirement 6 explained

☐ **(a)** Explore careers related to this merit badge. Research one career to learn about the training and education needed, costs, job prospects, salary, job duties, and career advancement. Your research methods may include—with your parent or guardian's permission—an internet or library search, an interview with a professional in the field, or a visit to a location where people in this career work. Discuss with your counselor both your findings and what about this profession might make it an interesting career.
Scouting America resources: Variety of Jobs for Computer Scientists (video) · 9 Computer Coding Careers (website)
Education Required to Become a Computer Programmer (website) · Design Technologist at Meow Wolf (video)

Careers related to programming I explored

Career	What people in it do

The career I researched _____

Parent or guardian permission for my research _____

☐ I did an internet or library search
☐ I interviewed a professional in the field
☐ I visited a place where people in this career work

What I found

Topic	My findings
Training and education needed	
Costs	
Job prospects	
Salary	
Job duties	
Career advancement	

What might make it an interesting career

☐ **(b)** Explore how you could use knowledge and skills from this merit badge to pursue a hobby or healthy lifestyle. Research any training needed, expenses, and organizations that promote or support it. Discuss with your counselor what short-term and long-term goals you might have if you pursued this.

My hobby or healthy lifestyle idea

What I found

Topic	My findings
Training needed	
Expenses	
Organizations that promote or support it	

Goals	If I pursued this
Short-term	
Long-term	

Requirement 6 completed on counselor initials

Counselor sign-off

Your counselor signs your blue card or approves the badge in Scoutbook, and your unit records it. This line is for your own records.

Counselor's signature Date completed

Official Scouting America resources

Scouting America resources: Programming merit badge page (requirements and resources) · Programming merit badge pamphlet (free PDF) All merit badges · **ScoutSmarts:** Programming Merit Badge Guide

Made by Cole at ScoutSmarts.com, an Eagle Scout who loves helping Scouts.
Spot an error or a requirement change? Tell me at scoutsmarts.com/contact.
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