

Cybersecurity Merit Badge

Updated: 12/31/25

Important information about how to prepare for the merit badge

Parents, please review the content of a merit badge prior to registering your Scout: some badges may be challenging for younger Scouts. Also, the class discussions are more interesting if Scouts submit *all* the requirements for the badge before the program. The chances of your scout completing all the work for the badge increases dramatically when they are properly motivated and the badge content is age-appropriate. Cybersecurity is complex and academic in nature and will be easier for Scouts older than 12 years of age to complete.

Merit badges are not designed to be completed in a day and require independent work on the part of the Scout outside of the workshop.

Parents and Leaders: Each Scout must complete the requirements individually. Group answers or copying from others will result in the requirements being rejected. You may provide resources to assist, but neither you nor anyone else may complete any part of the requirements on behalf of the Scout.

- It is the Scout's responsibility to fulfill the requirements, not the parent's. A Scout may use a parent's email account to submit their answers, but:
- It is not the parent's responsibility to scan or submit the Scout's work. This is the Scout's responsibility.

Parents should not act as the Scout's agent. All assignments must be completed by the Scout. If issues arise, the Scout must communicate directly with me, copying a parent or guardian on all correspondence.

IMPORTANT: For full credit for the badge, evidence of the requirements, as explained below, must be sent to: bill.nelson@scouting.org

The merit badge will be held in two sessions about 2 hours long each.

All Scouts should be working on the requirements now. Please carefully follow the instructions here on how to complete the prerequisites.

About blue cards: We will utilize Scoutbook.com and record requirement completion online. Blue cards can be printed by parents and unit leaders in Scoutbook by clicking on the Scout, the Scout's advancement, the merit badge, and print blue cards.

Cybersecurity Requirements

TYPE OR WRITE LEGIBLY AND WHERE NOT ASKED FOR A LIST, IN COMPLETE SENTENCES.

PUT YOUR NAME IN EMAILS TO ME AND IN ALL ATTACHMENTS

READ THE REQUIREMENTS CAREFULLY, YOU MUST ANSWER THE REQUIREMENTS AND PROVIDE WHAT IS BEING ASKED FOR.

COPY A PARENT OR GUARDIAN IN ALL CORRESPONDENCE

ANSWER THE QUESTIONS IN YOUR OWN WORDS, DO NOT JUST COPY FROM THE INTERNET!!

USE A WORD DOCUMENT TO RECORD YOUR ANSWERS TO THE REQUIREMENTS AND HAND THEM INTO ME – ALSO BE PREPARED TO DISCUSS THEM IN CLASS.

ANSWER THE QUESTIONS IN YOUR OWN WORDS, DO NOT JUST COPY FROM THE INTERNET!!

1. Safety. Do the following:

- (a) View the Personal Safety Awareness "Digital Safety" video (with your parent or guardian's permission).

Please send me a copy of a screen shots from the video.

Resources: [Personal Safety Awareness "Digital Safety" \(video\)](#) Note: there are a number of videos on the page, you only have to watch the "Digital Safety" one.

- (b) Explain to your counselor how to protect your digital footprint, such as while using social media, mobile device apps, and online gaming. Show how to set privacy settings to protect your personal information, including photos of yourself or your location. A **digital footprint** is the trail of data you leave behind whenever you use the internet, including websites you visit, messages you send, and information you share.

Explain in a Word document.

Resources: [Protecting Your Digital Footprint - Keys to Cybersecurity \(website\)](#)
[Big Data Privacy, Security, & Liability Issues: CompTIA's Future of Tech \(website\)](#)

- (c) Discuss first aid and prevention for potential injuries, such as eye strain, repetitive injuries, and handling electronics devices, that could occur during repeated use. Discuss how to keep yourself physically safe while using a mobile device (for example while walking or biking). *Describe in a Word document.*

Resources: [How to Avoid Strained Eyes From Staring at Digital Screens \(video\)](#)
[Doctors Share How to Prevent Smartphone Related Injuries Like "Text Neck" and "Smartphone Pinky" \(video\)](#)

2. Ethics. Do the following:

- (a) Relate three points of the Scout law to things people do on the internet or with computers, phones, and other connected electronic devices.

Describe in a Word document.

Resources: [Code of Ethics \(website\)](#)
[The Ten Commandments of Computer Ethics \(website\)](#)

- (b) Discuss with your counselor examples of ethical and unethical behavior in cyberspace. Include how to act responsibly when you encounter situations such as: coming across an unattended or unlocked computer or mobile device; observing someone type their password or seeing it written down near a computer; or discovering a website that is not properly secured. Explain why these situations require good judgement, and how the Scout Law and personal values should guide your actions. *Describe in a Word document.*

Resources: [Ethical Issues in Cybersecurity: CompTIA's Future of Tech \(website\)](#)
[Understanding Cybersecurity Ethics: Navigating Privacy and Security Challenges \(website\)](#)

3. Fundamentals. Do the following and discuss each with your counselor:

- (a) Describe three types of computer systems that need protecting and explain why. *Describe in a Word document.*

Resources: [Cybersecurity Explained | Future of Tech \(video\)](#)
[What Is Cybersecurity? Why Do We Need Cybersecurity?: CompTIA's Future of Tech \(website\)](#)
[Cybersecurity in Critical Infrastructure: Protecting Power Grids and Smart Grids—Cyber Defense Magazine \(website\)](#)

- (b) Explain the "C.I.A. Triad"—Confidentiality, Integrity, and Availability—and why these three principles are fundamental to cybersecurity. *Describe in a Word document.*

Resources: [What Is the CIA Triad \(IBM Technology\) \(video\)](#)
[What Is the CIA Triad? | Coursera \(website\)](#)

4. Cyber Threats, Vulnerabilities, and Attacks. Do the following and discuss each with your counselor:

- (a) Define the terms vulnerability, threat, and exploit, and give an example of each that might apply to a website or software product you use. *Describe in a Word document.*

Resources: [The Internet: Cybersecurity & Crime \(video\)](#)
[Hackers & Cyber Attacks: Crash Course Computer Science #32 \(video\)](#)
[Protecting Your Digital Footprint - Keys to Cybersecurity \(website\)](#)

- (b) Pick one type of malware (such as virus, worm, Trojan, backdoor, spyware, or ransomware) and find out how it works. Explain what it does and the harm it can cause. *Describe in a Word document.*

Resources: [Computer Malware \(Article\) | Cyber Attacks | Khan Academy \(website\)](#)
[Every Type of Computer Virus Explained in 8 Minutes \(video\)](#)
[5 of the Worst Computer Viruses Ever \(video\)](#)

- (c) Identify two risks of using public Wi-Fi and describe how to reduce or avoid those risks. *Describe in a Word document.*

Resources: [Is Public Wi-Fi Safe? \(video\)](#)
[Connected Devices - Keys to Cybersecurity \(website\)](#)
[Hacker Demonstrates Security Risks Of Free Public Wi-Fi \(video\)](#)

- (d) Describe what spoofing and phishing are, and how to recognize a message or website that might be trying to trick you. Explain what steps you should take to protect yourself and others if you come across one. *Describe in a Word document.*

Resources: [Online Threats and Vulnerabilities - Keys to Cybersecurity \(website\)](#)
[How Not to Get Hacked: Phishing \(video\)](#)
[Recognize and Report Phishing | CISA \(website\)](#)

- (e) **Current Events.** Do ONE of the following:

- (1) Read an article or a news report about a recent cybersecurity incident, such as a data breach or malware infection. Explain how the incident happened (to the best of your ability based on the information available) and what the consequences are or might be to the victim. *Describe in a Word document.*

Resources: [Featured Conversation Starters - Savvy Cyber Kids \(website\)](#)
[Krebs on Security - In-Depth Security News and Investigation \(website\)](#)
[Security News: Cybersecurity, Hacks, Privacy, National Security | WIRED \(website\)](#)
[Cybersecurity News, Insights and Analysis | SecurityWeek \(website\)](#)

- (2) With your parent or guardian's permission, watch a movie or read a book in which cybersecurity plays a significant role. Discuss how cybersecurity topics were depicted and how realistic you think it was.

Resources:

Suggested Movies: WarGames (1983, PG), Tron (1982, PG), Code 2600 (2011 Documentary, PG), Superman III (1983, PG), Scooby-Doo and the Cyber Chase (2001, Not Rated), Cyber War 2022 (2023 Documentary, G), Hackers (1995, PG-13), Terms and Conditions May Apply (2013 Documentary, Not Rated), Cyber War (2016 Documentary, Not Rated), and Zero Days (2016 Documentary, PG-13).

Suggested Books: The Cuckoo's Egg by Cliff Stoll, Tom Clancy's Net Force Explorers YA series, The Enigma Girls: How Ten Teenagers Broke Ciphers, Kept Secrets, and Helped Win World War II by Candace Fleming, Cyber-Thief Showdown (Geronimo Stilton #68) by Geronimo Stilton, Little Brother by Cory Doctorow (read for free online), Cyberama: A Children's Book on Internet Safety and Cybersecurity, The Renegade Reporters by Elissa Brent Weissman, The Oracle Code by Marieke Nijkamp, Hacker by Malorie Blackman, and City Spies series by James Ponti.

- (f) **Create a list** of what is part of your cyber attack surface including all the ways someone could try to access your personal information or devices—such as online accounts, apps, or home networks. *Describe in a Word document.*

Resource: [What Is an Attack Surface? | Cybersecurity Explained in 60 Seconds \(video\)](#)

5. Cyber Defenses. Do the following:

- (a) Describe three technologies that are used to defend a computer or network, such as access controls, antivirus software, firewall, intrusion detection/prevention systems, and Virtual Private Network. *Describe in a Word document.*

Resources: [Cybersecurity: Crash Course Computer Science #31 - YouTube \(video\)](#)
[Understanding Firewalls for Home and Small Office Use | CISA \(website\)](#)
[Technologies in Cybersecurity: CompTIA's Future of Tech \(website\)](#)

- (b) **Installing updates.** Do the following:

- (1) Explain to your counselor the importance of installing the latest updates on your computer, why they are needed, and what kinds of problems they can prevent. *Explain in a Word document.*

Resources: [How Not to Get Hacked: Install Updates \(Code.org\) \(video\)](#)
[Update Software | CISA \(website\)](#)

(2) Demonstrate to your counselor how to check for, download, and install the latest updates for your computer or mobile device, or another computer you have permission to use (if you are unable to do this on your computer, you may use an online guide with screenshots to demonstrate this). Show your counselor how to verify that your computer or mobile device is up-to-date. **You actually need to do this and send me screen shots from your device showing you doing this.**

Resource: [Keep Your Device's Operating System and Applications Up to Date | CISA \(website\)](#)

GIVE ME SCREEN SHOTS SHOWING REQUIREMENT 5(B)(2)

(c) **System security.** With your parent or guardian's permission, do THREE of the following using a computer or mobile device, and discuss with your counselor:

(1) Describe what makes a good password and why. Set or change an account password to one that is "strong." *Describe what makes a good password and why in a word document*

Resources: [How Not to Get Hacked: Passwords \(video\)](#)
[Defense in Depth—Keys to Cybersecurity | Cyber.org \(website\)](#)
[Protecting Your Digital Footprint - Keys to Cybersecurity \(website\)](#)
[Strong Passwords | Khan Academy \(website\)](#)
[Use Strong Passwords | CISA \(website\)](#)

(2) Describe multi-factor authentication (MFA) and how it can be used to improve security. Demonstrate how to use an authenticator app or other MFA function. *Describe in a word document.*

Resources: [Defense in Depth - Keys to Cybersecurity | Cyber.org \(website\)](#)
[Multi-factor Authentication | Khan Academy \(website\)](#)
[Turn On MFA | CISA \(website\)](#)
[More Than a Password | CISA \(website\)](#)

(3) Install and set up a password manager. Demonstrate how it works to your counselor. **Show me pictures of how it works with example (unreal) passwords**

Resource: [Yes, You Need a Password Manager. Here's Why | Khan Academy \(website\)](#)

(4) Run a virus scan. Show the results to your counselor. **(show me pictures of the results)**

Resources: [Understanding Anti-Virus Software | CISA \(website\)](#)
[Ensure Your OS Antivirus and Anti-Malware Protections are Active | CISA \(website\)](#)
[How to Start a Scan for Viruses or Malware in Microsoft Defender - Microsoft Support \(website\)](#)
[How to Run a Virus Scan on Windows 11: A Step-by-Step Guide - Solve Your Tech \(website\)](#)
[How to Scan an Android Phone for Malware - Android Authority \(website\)](#)
[MalwareBytes Free Virus Scanner \(website\)](#)
[Free Online Virus Scan | Trend Micro HouseCall | Trend Micro \(US\) \(website\)](#)

(5) Using a command line or other built-in tool, see what programs or processes are running on your computer. Run this on our device and discuss with your counselor what you see and what surprises you. *(Use a Word document for this and show pictures of what you see.)*

Resources: [How to View All Running Processes in Windows 10 & 11 \(video\)](#)
[How to Tell What's Running in the Background on Your PC \(video\)](#)
[View Information About Mac Processes in Activity Monitor - Apple Support \(Bw\) \(video\)](#)
[Kill Apps and Processes on Chromebook Using the Task Manager \(video\)](#)
[How to Access Your Chromebook's Task Manager \(video\)](#)

(6) Use a command line interface to view your computer's open network connections. Discuss the results with your counselor. *(Use a Word document for this and show pictures of what you see.)*

Resources: [How to Use the Netstat Command \(video\)](#)
[How to Use the Netstat Command on Mac \(website\)](#)
[View Your Linux Server's Network Connections With Netstat | Opensource.com \(website\)](#)

(7) Demonstrate how to back up your data from a mobile device to a local computer or the cloud. *Share what you did and learned in a Word document. Send me pictures of you doing your backup.*

Resources:

Apple:

[How to Back Up With iCloud - Apple Support \(website\)](#)

[How to Back up Your iPhone, iPad, and iPod Touch - Apple Support \(website\)](#)

[iCloud Data Security Overview - Apple Support \(website\)](#)

Android:

[Back Up or Restore Data on Your Android Device - Android Help \(google.com\) \(website\)](#)

[Back Up Your Device - Android - Google One Help \(website\)](#)

(8) Research best practices for protecting a home computer or network, and make a checklist of FIVE things you and your family can do to stay secure. *Share what you did and learned in a Word document*

Resources: [Secure Our World | CISA \(website\)](#)

[Home Network Security | CISA \(website\)](#)

[Best Practices for Securing Your Home Network | NSA \(PDF\)](#)

(9) Identify one or more other vulnerabilities on your home computer or network or another computer or network you have permission to use and discuss with your counselor. With permission from the system owner, take the necessary actions to fix it. *Share what you did and learned in a Word document.*

6. Cryptography. Do the following:

(a) Research and explain to your counselor three situations where encryption is used in cybersecurity. For each situation, describe what kind of encryption is used and why it is important. *Share what you did and learned in a Word document.*

Resources: [Cryptography: Crash Course Computer Science #33 \(video\)](#)

[The Science of Codes: An Intro to Cryptography \(video\)](#)

[The Need for Encryption | Khan Academy \(website\)](#)

[The Internet: Encryption & Public Key \(Code.org\) \(video\)](#)

(b) Show how you can know if your connection to a website is encrypted. *Share what you did and learned in a Word document. Give me pictures illustrating a secure connection.*

Resources: [How Not to Get Hacked: Websites and Wi-Fi \(video\)](#)

[HTTP Secure \(HTTPS\) | Khan Academy \(website\)](#)

(c) Do ONE of the following:

(1) Create your own encryption code, such as a substitution cipher or code book, and demonstrate using it to encrypt and decrypt a message. Describe the strengths and weaknesses of your code. *Share what you did and learned in a Word document. Show me examples of your code.*

Resources: [Encryption, Decryption, and Cracking | Khan Academy \(website\)](#)

[Creating a Substitution Cipher \(video\)](#)

[Symmetric Encryption Techniques | Khan Academy \(website\)](#)

[How to Create Substitution Ciphers: 9 Steps \(With Pictures\) \(website\)](#)

(2) Download and set up an app (from an official app store) that uses end-to-end encryption. Explain to your counselor what this means, how it works, and why it is more secure than other forms of communication (e.g. SMS). *Share what you did and learned in a Word document.*

Resources: [The Best Private Messaging Apps for 2025 | PCMag \(website\)](#)

[The Best Encrypted Messaging Apps in 2025 | Tom's Guide \(website\)](#)

[The Seven Best Secure Messaging Apps With End-to-End Encryption | The Verge \(website\)](#)

[NSA Warning-Change Your iPhone and Android Message Settings \(website\)](#)

(3) Use a hashing tool (for example, using SHA or MD5) to create a checksum for a file, document, or piece of text. Have a fellow Scout or your counselor make a change to it, then recreate the checksum and compare the new checksum to the original as a demonstration of file integrity checking. *Share what you did and learned in a Word document. Show me examples of your checksum (can be screenshots.)*

Resources: [Hashing Algorithms and Security - Computerphile \(video\)](#)

[Online Hash Calculator \(website\)](#)

[Protecting Your Digital Footprint - Keys to Cybersecurity \(website\)](#)

(4) Create your own PGP (pretty good privacy) email key. Share your public key with others (and your counselor). Also, get their public keys and add them to your computer's key ring. Send a message that has been digitally encrypted. *Share what you did and learned in a Word document.*

Resources: [PGP Encryption With Kleopatra - Kevin's Guides \(website\)](#)

[How to Use PGP/GPG Encryption - in 2 Minutes - PGP /GPG Tutorial for Beginners \(video\)](#)

7. Connected Devices and Internet of Things (IoT). Describe to your counselor four electronic devices you encounter that could be connected to the internet, why this connectivity can be useful, what risks are posed by the connectivity, and how they could be protected. *Describe these in a Word document.*

Resources: [Connected Devices - Keys to Cybersecurity | Cyber.org \(website\)](#)
[Internet of Things | What is IoT ? | How IoT Works? | IoT Explained in 6 Minutes | Simplilearn \(video\)](#)
[What is the Internet of Things \(IoT\)? | IBM \(website\)](#)

8. Cybersecurity Activities. Do ONE of the following:

(a) Learn about a cybersecurity competition, camp, or other activity you could participate in (either now or in the future). Share what you learned with your counselor, including the type of activity, time commitment, and age of participants. *Share what you learned in a Word document.*

Resources: [CyberPatriot: National Youth Cyber Defense Competition \(website\)](#)
[picoCTF - CMU Cybersecurity Competition \(website\)](#)
[AFA CyberCamps \(website\)](#)
[U.S. Cyber Camp \(website\)](#)
[National Cyber League \(website\)](#)

(b) Participate in a cybersecurity competition with members of your troop, school, or some other group approved by your counselor. Either design your own competition or use an existing platform. *Explain what you did in a Word document.*

Resources: [Cyber Challenge: Online Cybersecurity Game | Cybermission \(website\)](#)
[NCF Cybersecurity Computer Gaming Series \(website\)](#)
[Cyber Threat Defender - The UTSA CIAS \(website\)](#)
[K-12 Cybersecurity Games - The UTSA CIAS \(website\)](#)
[picoCTF - CMU Cybersecurity Competition \(website\)](#)

(c) Give a presentation to your patrol, troop, or another group approved by your counselor, on a cybersecurity topic of your choice. Your presentation must include at least one demonstration and/or hands-on activity. *Send me your presentation prior to giving it so I can approve it. After presenting it, send me a note from someone who saw you give it.*

9. Careers. Do ONE of the following:

(a) Identify three career opportunities that would use skills and knowledge in cybersecurity. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.

Resources: [Career Exploration Cards | Cyber.org \(PDF\)](#)
[Degrees & Certifications | Cyber.org \(website\)](#)
[Information security and forensics analyst | What I do \(video\)](#)
[Careers in Cybersecurity: CompTIA's Future of Tech \(website\)](#)
[Military Cybersecurity Careers & Training | Cybermission \(website\)](#)
[NCF Panel Discussion about Cybersecurity Careers | #CyberChats \(podcast\)](#)

(b) Visit a business or organization that does work in cybersecurity. Find out about different work roles, what they do, and how they acquired their knowledge through college degrees or certifications. Share what you learned with your counselor.