



Junior Cybersecurity Basics

Pillar: STEAM

Outcomes: Positive Values, Community Problem Solving

Juniors will earn their badge by learning the basics of cybersecurity and how computers communicate.

Cybersecurity keeps the world safe. Every company that uses computers depends on people and software to protect them and the information they contain. If you love mysteries and solving puzzles, you will love learning about cybersecurity. Note: This is the first of three sequential Cybersecurity badges and this is all about learning some basics. The other badges help put these concepts into practice.

1. Find out how computers read information.
 - a. Computers have their own coded language to process information. This language uses the two numbers 0 and 1 in specific patterns to “speak” and share directions. It is called **binary code**. Any code that uses two elements is called a binary code. When you go online or play a video game, binary code spells out what the computer should do.
 - b. If you want, make a binary code bracelet with your name or another word. Instructions [here](#).
2. Discover how networks work.
 - a. Computers – and devices such as laptops, tablets, and smartphones – that are linked together are part of a **network**. Every day you connect with a network of people. For example, you connect with your parents, siblings, classmates, teachers, neighbors, friends, and many more.
 - b. Notice networks. People who all attend the same school are in one network. TV shows on the same station are in a network. A Girl Scout troop is a network. In the same way, computer networks are groups of computers that are connected to the **internet**.
 - c. One way of protecting a private message is to use a secret code. Here are some secret codes you can use with your friends, troop, and family. Give them a try; you will learn how encryption works, which is an important way to keep information safe.
 - i. Try [pigpen code](#).
 - ii. Try [Morse Code](#). People used [Morse code](#) before telephones were invented! It is still very popular in the Navy.
 - iii. Learn these [words](#): anti-virus software, cipher, code, download, hacker, network, password, private information, protocol, spam, username
3. Find out what protocols are and create one.
 - a. Protocols are important in everyday life. A **protocol** is a set of rules that says exactly how something should be done. For example, when a school bus stops and turns on its flashing light, drivers also stop. That helps keep children safe as they get off the bus. Before an airplane takes off, the pilot uses a checklist – a set of protocols – to make sure the equipment and instruments work properly. When computers share data, they follow a set of rules (or protocols) that make it easier and safer to share information.



4. Explore computer communication protocols.
 - b. If you want to communicate or speak with a friend, you might tap her on the shoulder, call her name, or wave to get her attention. Then, once she sees you and is ready, you can talk. The first step is to make a connection. For a computer to pass along any information it must make a connection between the host and the server. In order to do this, the computer follows a three-step protocol, called a “**handshake**”.
 - i. Step 1 – a request is sent out.
 - ii. Step 2 – the request is received and understood.
 - iii. Step 3 – the request and the acceptance of the request is then acknowledged by the sender. Now messages can be sent!
5. Find out what malware is.
 - a. Combine the words “malicious” (meaning harmful) and “software” and you get the word “**malware**”. Malware is software that can attack computers, tablets, phones, and other digital devices and cause harm. Just like people can get sick, computers can get sick with viruses. Computer viruses are one type of malware. They make their way into your computer when you download email attachments or content from someone else’s flash drive. When you click on ads or download programs from the internet, you also risk getting a virus. Find out the ways that malware can attack your computer [here](#).

If you made a binary code bracelet, share a picture of your work on the [GSKSMO Virtual Art Show](#)

Additional online resources

- [Junior Cybersecurity Pinterest Board](#)

When you’re finished: Congratulations, you have earned your badge! You can purchase by emailing shopdept@gksmo.org or at <https://www.girlscoutshop.com/Junior-Cybersecurity-Basics-Badge>

No shipping charges apply at this time.

