Programming

1. **Safety.** Do the following:

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

   (b) Discuss first aid and prevention for the types of injuries that could occur during programming activities, including repetitive stress injuries and eyestrain.

2. **History.** Do the following:

   (a) Give a brief history of programming, including at least three milestones related to the advancement or development of programming.

   (b) Discuss with your counselor the history of programming and the evolution of programming languages.

3. **General knowledge.** Do the following:

   (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.

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

4. **Intellectual property.** Do the following:

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

   (b) Describe 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.

5. **Projects.** Do the following:

   (a) With your counselor's approval, choose a sample program. Modify the code or add a function or subroutine to it. Debug and demonstrate the modified program to your counselor.

The Programming merit badge website, www.scoutlife.org/programming, has a number of sample programs that you could use for requirement 5a. However, you have the option of finding a program on your own. It's a good idea to seek your merit badge counselor's guidance.

(b) With your counselor's approval, choose a second programming language and development environment, different from those used for requirement 5a and in a different industry from 5a. Then write, debug, and demonstrate a functioning program to your counselor, using that language and environment.

(c) With your counselor's approval, choose a third programming language and development environment, different from those used for requirements 5a and 5b and in a different industry from 5a or 5b. Then write, debug, and demonstrate a functioning program to your counselor, using that language and environment.

(d) Explain how the programs you wrote for requirements 5a, 5b, and 5c process inputs, how they make decisions based on those inputs, and how they provide outputs based on the decision making.

6. **Careers.** Find out about three career opportunities that require knowledge in programming. Pick one and find out the education, training, and experience required. Discuss this with your counselor and explain why this career might be of interest to you.