



## Ambassador Coding Basics Badge

**Pillar:** STEM

Outcomes: Strong Sense of Self, Challenge Seeking

**Ambassadors will earn their badge by learning how programmers write code with functions and arguments. This can help spread messages or build community.**

1. Learn about functions through song lyrics
  - a. An **algorithm** is a series of specific instructions that a computer follows to accomplish tasks. They are made up of different parts like functions, arguments, and variables. In coding, the individual steps or actions in an algorithm are called **functions**. Functions perform generic tasks. For example: `singChorus()`; or `whistle()`; are two functions. The `singChorus()`; function gives the instruction to sing the chorus of a song. Notice how the function is written out with just a few words, with no space between them, followed by parenthesis. Inside the parenthesis is where the argument goes, as you will see in the next step.
  - b. In programming, you add **arguments** to make your functions more specific. For example, the function `sing()`; could sing, but `sing("This Land Is Your Land")`; could sing a specific song, and `sing("This Land Is Your Land", name)`; could sing a song to a specific person. Notice how the name was separated by a comma after the song.
  - c. Choose a song you like that promotes positive social change and rewrite some of the lyrics to include functions and arguments. Here are examples of songs that promote positive social change: ["Where is the Love"](#) by Black Eyed Peas or ["Imagine"](#) by John Lennon
  - d. Learn these computer science words [here](#): algorithm, argument, function declaration, iteration, JavaScript, sequence, software, syntax, variable, code, choreographer, function, pseudocode, whiteboarding
  
2. Learn about loops through song patterns
  - a. A **loop** is a function that tells the computer to repeat a piece of code a certain number of times. For example, the part that we sing and repeat several times in a song is called the chorus. That would be the loop! The verses cannot be loops, because they don't repeat.
  - b. Now, create your own song lyrics that include a message of encouraging positive social change in some way. Your lyrics are essentially a code that will help people sing in the language you program. Write at least one chorus and two verses. Mark where your loop(s) and verses are. How many loops and verses did you write? Can you simplify your code/lyrics?
  - c. Check out the following websites to explore different avenues of coding: <https://www.vidcode.com/> & <https://www.tynker.com/>
  
3. Write an algorithm duet
  - a. Collaboration allows programmers to share ideas and inspire each other. Sometimes songwriters and musicians collaborate, too. What are the benefits of working together on a creative project? Can you think of any challenges to collaborating or drawbacks? What makes a good collaborative team?
  - b. With a member of your household or partner with a friend on video chat, take turns quickly writing lyrics to a song. The only rule is that you have to build on the lines your partner previously wrote,

keeping the message positive. Complete about 10 rounds so the songs will be 10-20 lines long. When completed, share with others in your household or create a video to share virtually!

- c. Learn about [Karen Sparck Jones](#), who created the foundation for search engines!

#### 4. Code a performance routine

- d. Just like programmers give specific step-by-step instructions to a computer, a choreographer creates specific step-by-step instructions for dancers. Choreographers use special languages that dancers understand, write down steps in sequence and use special syntax to indicate repeating steps.
- e. Using your song you created in step 3, create step-by-step directions for how you would like to perform the song. Include some fun actions such as holding a microphone, dance moves, hair flips, etc. and when they need to happen with the song lyrics.
- f. For a more in-depth explanation of coding click on [this link](#).

#### 5. Share your coded routine with others

- a. Learn about [Raye Montague](#), a groundbreaking engineer and ship designer. What 3 facts stood out to you?
- b. Imagine a dancer hasn't seen a dance and was trying to recreate it based only on a set of written notes from a choreographer—it would be a lot like a computer running a program. The notes would have to be very detailed and specific for the dancer to recreate the dance accurately. Have other people do the dance moves you created in step 4 only by looking at your instructions. How did they do? Did they miss steps or not do them like you imagined? Then that is a great opportunity to learn and re-write code. Together, look at your code you created in step 4 to find and fix errors, improve the user experience, or clarify instructions. That is a new iteration. You can see why whiteboarding and collaboration are important steps in writing good code. Sometimes how we imagine or assume it will work, is not how other interpret it.
- c. Finally, have everyone perform the steps with you! How did it go this time?
- d. Are there other times in life when collaboration would be helpful?

**When you're finished:** Congratulations, you have earned your badge! You can purchase by emailing [shopdept@gksmo.org](mailto:shopdept@gksmo.org) or at <https://www.girlscoutshop.com/AMBASSADOR-CODING-BASICS-BADGE>

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