

## Activity 1: Write code to create a portrait

Drawing something is always done with a series of steps. But explaining to a human how to draw something is much easier than explaining how to draw the same thing to a computer. Today, we are going to write pseudocode instructions for how to draw self portraits.

The first thing that is important to learn is the difference between functions and arguments.

Functions are instructions in programs that tell the computer to perform a certain task. For example a function could be:

```
MakeCake ();
```

This function is giving the instruction to make a cake. An argument makes a function more specific. For example:

```
MakeCake ("Chocolate");
```

This function with an argument is giving the instruction to make a chocolate cake. Arguments and functions work together all the time in computer code.

Another word you probably don't know is pseudocode. Pseudocode is a simplified programming language. Programmers use pseudocode to write down their ideas before actually writing the code.

Since computers are so specific, there are a few rules that we have to follow:

1. No part of your code can start with a number.
2. There can't be any spaces in your functions. A function could be `MakeCake ()` but not `Make Cake ()`
3. You have to have a semicolon at the end of all functions such as `MakeCake ();`
4. You can't put words after your parentheses. `MakeCake ()` again won't work

Let's think about the functions that we would need to draw a self-portrait. For myself, I would use these functions:

```
DrawLips ();
```

```
DrawRightEye ();
```

```
DrawLeftEye ();
```

```
DrawNose ();
```

```
DrawFreckles ();
```

```
DrawGlasses ();
```

```
DrawHair ();
```

Are there any that you don't need in my list? What about ones that you need that I didn't include?

Next we want to add arguments. Remember that for our `MakeCake ()` function, we added

MakeCake ("Chocolate") to our function to indicate that we want a chocolate cake. So what details could we add to our functions to make them more specific? For me, I might add something like this:

DrawRightEye (Green);

DrawLeftEye (Green);

DrawGlasses (Black);

DrawHair (Brown);

Write your own code to make it more specific to you!

## Activity 2: Explore "If" statements

If statements in computer logic can take many forms. A good example of this is a math equation. Below is pseudocode that asks what the answer is to  $5 + 5$ . If I answer 10, then the computer tells me that I'm correct. If I answer with anything else, the computer says it's incorrect.

Ask ("What is  $5 + 5$ ?")

If

    Answer = 10;

    Say ("That's correct.");

Else

    Say ("That is incorrect.");

Now, let's use [Scratch](#) to write our code!

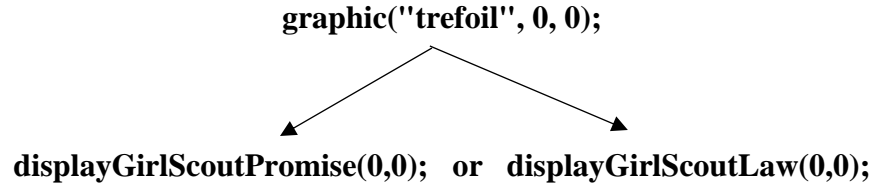
[Here is a video](#) of me creating my own code in Scratch!

Check out this video from [Khan Academy](#) to learn more about If Statements.

## Activity 3: Learn about computer logic

### THINGS TO KNOW:

- **Control flow** refers to the order that a computer will execute functions or other operations. It's the sequence in which the algorithms are done and the order of the different decisions computers can make.
- Typically in coding, as with English, the control flow goes from top to bottom.
- Control flow tells the computer which order it should do things, but it can also be used to make decisions: should the computer do this thing or that thing?
- Now, look at a program that can display the GS trefoil, and then EITHER the Girl Scout promise or the Girl Scout law.



**The control flow could either go down one branch or another. It would display the promise, or it would display the law.**

Boolean coding is very simply true or false, yes or no questions such as the ones below:

- "True or false: Are you a Girl Scout?" can be written as a statement:

You are a Girl Scout:

This is True!

- "True or false: Is the Earth bigger than the moon?" can be written:

The Earth is bigger than the moon:

This is True!

- "True or false: Are you younger than 6 years old?" is the same as:

You are younger than 6 years old:

This is FALSE! (Senior Girl Scouts are older than 6!)

- "True or false: Are you 15 years old?" is the same as:

You are 15:

This could be true or false for the girls, but only true if they're exactly 15 years old.

- Your favorite subject is science.

Now that you understand the idea of Boolean logic, it's time to look at the code and how you can express these ideas to a computer. For example, you can ask about relative statements like, "True or false: You are older than 10." This can be written in JavaScript as:

**yourAge > 10**

You use the 'greater than' sign! yourAge IS GREATER THAN 10.

- Or, you can use a 'less than' sign for a statement like "True or false: You are younger than me." This can be written in JavaScript as:

**`yourAge < myAge`**

You use the 'less than' sign. This says yourAge IS LESS THAN myAge

Earlier, you learned that you can't ask "How old are you?" because the answer isn't true or false. But you can rethink the idea and instead ask, "True or false: Are you 8 years old?" This can be written in JavaScript as:

**`yourAge == 8`**

Notice how the last example (`yourAge == 8`) is written. With JavaScript, you can ask 'yourAge EQUALS 8'. It looks like you're making a statement, but it's a statement that could be either true or false. You use the `==` sign (double equal). Not `=` (one equal). The `==` is JavaScript's way of asking the true or false question.

#### **Activity 4: Use computer logic to create a quiz show**

Computer logic is very simple. Using questions that you can only answer yes or no to, create a game that you can play.

You could play a game of Guess Who? And create questions that will help the guesser figure out who you're talking about. Or you could play 20 questions with someone!

**Congratulations! You've completed the Senior Coding for Good 1: Coding Basics Badge. [Click here](#) to purchase it from our store!**