Lesson 9: Looping and Random Numbers

Adapted from code.org curriculum

Objectives: You will be able to...

- Use a loop in a program to simplify the expression of repeated tasks

- Identify appropriate situations in a program for using a loop

- Use random values within a loop to repeat code that behaves differently each time it is executed

Getting Started: Loops vs. Functions

- As we have developed as programmers, we have focused on the process of breaking down large tasks into smaller pieces and assigning each piece a function

- Sometimes, we have seen a need to repeat a portion of code many times; this may work if we need to repeat it 5 times, but what about 1,000,000?

- Today we'll be exploring the "loop" programming construct

- Something to think about as you work through stage 9:
    - "When should you use a loop instead of a function, or vice versa?"

Activity: Improving Under The Sea with Loops

- Today we'll learn how to use the "for loop"
- The for loop is a JavaScript programming construct – it looks and works the same here as it does in "the real world"
  - Note: the for loop is in other languages as well such as Java and C++
- Go through stage 9 of Code Studio

Wrap-up: When to use loops vs. functions

- Develop a rule for deciding when to use a loop within a program. Perhaps think about when to use a loop vs. a function.

- Try to make connections to Top-Down Design in your response. Below your rule, write a couple sentences justifying your rule.

Wrap-up: When to use loops vs. functions

- Write a function when you have a piece of code – a procedure – that you might reuse in other places in your program
  - A function might also help you encapsulate a solution to a common problem in one place that you can call on repeatedly with different inputs
  - Writing a function is often more of a design decision. You are trying to abstract details
- Write a loop when there is something you need to do over and over again and it doesn't make sense to split it up anymore
  - Writing a loop is more of an algorithmic decision – you actually just need repetitive behavior

Vocabulary:

- For Loop – A particular kind of looping construct provided in many in many languages. Typically, a for loop defines a counting variable that is checked and incremented on each iteration in order to loop a specific number of times

- Loop – the action of doing something over and over again