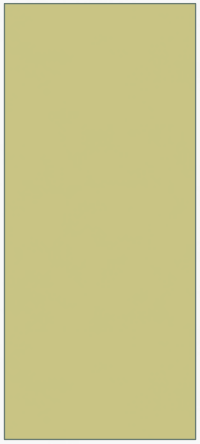
LESSON 6: FUNCTIONS AND TOP-DOWN DESIGN

ADAPTED FROM CODE.ORG CURRICULUM



OBJECTIVES: YOU WILL BE ABLE TOO…

- Write a complete program with functions that solve sub-tasks of a larger programming task
- Explain how functions are an example of abstraction
- Use a "top-down" problem-solving approach to identify sub-tasks of a larger programming task

VOCABULARY

- Abstraction – pulling out specific differences to make one solution work for multiple problems
- Function – A piece of code that you can easily call over and over again.

GETTING STARTED:

- What does Efficiency Mean?
- "Imagine that you have two programs that drew the diamond-shaped figure. One program uses functions as we did in the previous lesson. The other doesn't use functions; it's just a long sequence of the turtle's primitive commands. Which program is more efficient? Make an argument for why one is more efficient than the other."

ACTIVITY:

- Fill out the "Top-Down Design Worksheet"
  - On Google Classroom

ACTIVITY

- Complete the tasks in Stage 6 of Code Studio

WRAP-UP: SOME POINTS ABOUT FUNCTIONS AND ABSTRACTION

- When we layer functions – with functions that call other functions – we are creating layers of abstraction
- In programming, writing functions helps us create layers of abstraction that allow us to design and create increasingly complex systems
- We've seen layers of abstraction before in the design of Internet protocols, or in binary encoding of information

WRAP-UP: SOME POINTS ABOUT FUNCTIONS AND ABSTRACTION

- Solving a fundamental piece of a problem that can be reliably reused in a different context frees us to think about more complex problems because we can trust that piece that has been solved and don't have to worry about its details
- Solving small problems – like how to send a single bit from one place to another – allows us to think about bigger problems, like sending numbers, or text, or images, to multiple people, over networks, in packets… etc.

WRAP-UP: SOME POINTS ABOUT FUNCTIONS AND ABSTRACTION

- Where else in your life have you seen layers of abstraction?