# Lesson 4: Using Simple Commands

Adapted from code.org curriculum

# Objectives: You will be able to...

O Solve simple programming challenges when the set of allowed commands is constrained

O Explain considerations that go into "efficiency" of a program

O Use App Lab to write programs that create simple drawings with "turtle graphics"

O Work with a partner to program a turtle task that requires about 50 lines of code.

O Justify or explain choices made when programming a solution to a turtle task.

# Getting Started: Recall challenges of Algorithms Activities

O We have been preparing to learn how to program by doing some activities with LEGO and playing cards

O Today we will start programming for "real"

O What do you think will be the same? Different?

# Getting Started: Recall challenges of Algorithms Activities

O What do you think will be the same? Different?

- O Focus on creating processes
- O Multiple ways to solve a problem
- O Some struggles with understanding exactly what commands mean
- O Working with partners
- O Reasoning about solutions, testing them
- O Creatively applying the limited set of commands

# Programming is fun!

O Computers are machines. So if we invent an instruction or command for a computer to execute, then it should be unambiguous how the computer will interpret or attempt to execute the instruction

O The challenge (and fun) is understanding how to use and combine those instructions to make the computer do what you want

# Programming is fun!

O In computer science in general, all of the complexity we see on the computer is actually just the composition of a few simple elements

    O Example: Unit 1 (protocols)

    O Example: Unit 2 (data)

    O Now, the same with programming!

# Activity: Intro to App Lab

O We will use this throughout coding

O Just like the Internet Simulator, things will get more and more complex as we move through the lessons

O Go ahead and open up Code Studio Stage 4

O Work in pairs (but both should make the code)

O Go through each of the stages

# Wrap-Up: What does "efficiency" mean when programming?

O Share your solution with another group

O What strategies or reasoning did you use to identify possible solutions?

O Is the solution that you or another group found the most efficient? How do you know?

# Wrap-Up: What does "efficiency" mean when programming?

O What is the "most efficient" way to program the solution for the 3x3 grid?

O What does "efficiency" mean? – Discuss with your partner

# Wrap-Up: What does "efficiency" mean when programming?

O Today's activity challenged us to find the most efficient solution to a problem.

O We care about efficiency when we don't' want to waste something valuable (like money, time, space)

O Efficiency here may mean:

- O Lines of code
- O Storage space on a computer
- O Time it takes to run

# What's the point? Why constrain to 4 commands?

O What you did today is, in a microcosm, what you always do when programming: using a language to solve a problem

O Collaboration

O Creativity

O You will always be constrained by the programming language

O Multiple approaches are possible