Lesson 3: Sequencing with Angry Birds

45 minutes

Overview

In this **skill-building** lesson, students will develop sequential algorithms to move a bird from one side of a maze to the pig at the other side. To do this they will stack code blocks together in a linear sequence.

Purpose

In this lesson, students will develop programming and debugging skills on a computer platform. The block-based format of these puzzles help students learn about sequence and concepts, without having to worry about perfecting syntax.

Standards

Full Course Alignment

CSTA K-12 Computer Science Standards (2017)

- ▶ **AP** - Algorithms & Programming

Agenda

Warm Up (10 minutes)
- **Behaving in the Computer Lab**

Bridging Activity - Choose One (10 minutes)
- **Unplugged Activity Using Paper Blocks**
- **Online Activity Using Unplugged Arrows**

Main Activity (20 minutes)
- **Sequencing with Angry Birds**

Wrap Up (5 minutes)
- **Reflection**

Extended Learning

Cross-Curricular Opportunity

Objectives

Students will be able to:

- Experiment with standard block-based programming actions such as: clicking, drag and drop, etc.
- Model proper computer lab behaviors

Preparation

- If your students are brand new to dragging and dropping, consider assigning them ***Drag and Drop Practice** before starting this lesson.
- Watch the ***How to Make a Class Section on Code.org** - Teacher Video, Create your own class section on Code.org and make sure every student has a card with their passcode on it.
- Have the school IT person add a quick link for your class section to the computer desktop.
- Make sure each student has a journal.

Links

Heads Up! Please make a copy of any documents you plan to share with students.

For the teachers

- **20/20/20 Rule** - Resource
- **How to Make a Class Section on Code.org**

For the students

- **Drag and Drop Practice**

- **Feeling Faces** - Emotion Images
  - Make a Copy
- **Move It, Move It** - Map Activity
  - Make a Copy
- **Pair Programming** - Student Video
- **Unplugged Blockly Blocks (Grades K-1)** - Manipulatives
  - Make a Copy
- **Wiggles - GoNoodle** - Video

Vocabulary

- **Click** - Press the mouse button
- **Double-Click** - Press the mouse button very quickly
- **Drag** - Click your mouse button and hold as you move the mouse pointer to a new location
- **Drop** - Release your mouse button to "let go" of an item that you are dragging

Teaching Guide

Warm Up (10 minutes)

Behaving in the Computer Lab

Review expectations and how to behave when they enter the computer lab.

Teaching Tip

- Use calm bodies in the lab
- Remember not to chew gum or candy
- Sanitize your hands
- Sit with your partner at one computer
- Make sure that the first "driver" can reach the mouse
- When you get frustrated, don't hit or shake the computer or monitor
- Follow the ***20/20/20 Rule**
- How to deal with the ***Wiggles** every 20-30 minutes (requires a free login on GoNoodle)
- Ask your partner before you ask the teacher
- Keep volume down so everyone else can hear their partners
- Use your journal for keeping track of feelings and solutions

Discuss:

Have a good discussion around your computer lab expectations to make sure that students understand the rules. Some topics of discussion might include:

- Is running in the computer lab okay?
- How loudly should we walk when we are in the computer lab?
- What should you do if you get stuck on a puzzle?
- If you get frustrated, will it help to hit the computer?
- When we're about to go to the computer lab, how should we get ready?

Bridging Activity - Choose One (10 minutes)

To connect the unplugged lesson with the upcoming online lesson, choose *one* of the following activities to do with your class.

Unplugged Activity Using Paper Blocks

Model: Select a map from "Move It, Move It - Map Activity" from the "Move It, Move It" unplugged lesson. Using movement pieces from the **Manipulatives, show students how you would code this structure in this new way.

Pair/Think: Next, choose another map and have the students program what blocks a "robot" would need to read to get to the goal.

Make sure that they understand that the blocks need to go from top to bottom and they all need to touch!

Share: Have the students check each other's answers and resolve any questions or bugs that may come up.

-Or-

Online Activity Using Unplugged Arrows

Model: Pull a puzzle from the corresponding online levels. Show students how to get *Angry Bird* to the pig using the symbols. It can be helpful to rename the arrows "North", "South, "East", and "West". Once you have a program, trace it with your finger (or a pointer) and show how the bird will travel when the program is run.

Pair/Think: Next, move back to an easier puzzle, and have students try writing programs (using arrows) on their own.

Share: Encourage students to share their programs with other groups and see if they came up with solutions that are the same or different. Can anyone come up with another way of solving the puzzle?

Main Activity (20 minutes)

Sequencing with Angry Birds

Teaching Tip

Show the students the right way to help classmates:

- Don’t sit in the classmate’s chair
- Don’t use the classmate’s keyboard

- Don’t touch the classmate’s mouse
- Make sure the classmate can describe the solution to you out loud before you walk away

This lesson will teach students how to use Code.org to complete online puzzles.

Watch the ***Pair Programming** - student video with your students, then assign them to pairs. This should help students start off in the right direction.

1 **Video - Maze Intro: Programming with Blocks**

Teachers play a vital role in computer science education and supporting a collaborative and vibrant classroom environment. During online activities, the role of the teacher is primarily one of encouragement and support. Online lessons are meant to be student-centered, so teachers should avoid stepping in when students get stuck. Some ideas on how to do this are:

- Utilize pair programming whenever possible during the activity.
- Encourage students with questions/challenges to start by asking their partner.
- Unanswered questions can be escalated to a nearby group, who might already know the solution.
- Remind students to use the debugging process before you approach.
- Have students describe the problem that they’re seeing. What is it supposed to do? What does it do? What does that tell you?
- Remind frustrated students that frustration is a step on the path to learning, and that persistence will pay off.
- If a student is still stuck after all of this, ask leading questions to get the student to spot an error on their own.

2-7 **Skill Building**

2 3 4 5 6 7

Wrap Up (5 minutes)

Reflection

Give the students a journal prompt to help them process some of the things that they encountered during the day.

Prompts:

- Draw one of the ***Feeling Faces** that shows how you felt about today's lesson in the corner of your journal page.
- Can you draw a sequence for getting ready to go to the computer lab?
- Draw a computer lab "Do" and a "Don't"

Extended Learning

If students complete the puzzles early, have them spend some time trying to come up with their own puzzles in their Reflection Journal.

Cross-Curricular Opportunity

Interpreting Sticky Data (15-20 minutes)

Computer Science + Math

Intrepreting Sticky Data is an optional activity aligned to Common Core Math standards, written by our teacher community. Students will use paper manipulatives to organize, represent and interpret data.

Standards Addressed:

- **CCSS.MATH.CONTENT.1.MD.C.4:** Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.