

Lesson 1.3: Coding Challenges and Review

Objectives

In this lesson, students will:

- ❖ Code programming challenges, thereby practice basic programming concepts
- ❖ During the solution review, students will review the programming concepts of events, loops, random numbers, variables, conditional statements, creating a new block, broadcast messages, moving around the x/y coordinate plane

Agenda

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|--------------------------------|---------|
| 1. Code Challenges | 20 mins |
| 2. Solution to Code Challenges | 30 mins |

Resources & Links

- ❑ Solution project:
<https://scratch.mit.edu/projects/306686644>
- ❑ Challenge 1 starter project:
<https://scratch.mit.edu/projects/386412375/>

Preparation

- ❑ Projector for code demonstration
- ❑ Print student activity worksheet, one per student

Important Things to Note About This Lesson:

In this lesson, students code 4 challenges. The challenges serve as a litmus test to gain an understanding of how much students know, which students may need extra instruction and which topics may need to be reviewed. Going over the solutions with students is very valuable as it will serve as a review of prerequisite concepts. If certain topics need to be reviewed, they can be found in prior grade lessons. It is assumed students are at least familiar with the programming concepts used in the code challenges. Most concepts are introduced briefly when first used in a lesson.

The main concepts that should be reviewed during the solution activity are (they are defined in the unit's glossary [Unit 1 - The World of Computing](#))

- Loops
- Events
- Broadcast message
- Variables
- Conditional statements
- Random number
- Moving a sprite around on the stage (X/Y coordinate plane)
- Making a new block (procedures)

1. Code Challenges



Students should work on their own. You can break up the exercises or have them do all 4 at once. It is probably easier if they create a new project for each exercise.

It could be helpful to reassure students that they are not expected to know all the challenges. You could explain that this is a means to help you, the teacher, understand how much they have learned before and get everybody on the same page. Encourage students to move on to the next challenge if they are stuck.

Distribute the activity worksheet and tell students what to do.

2. Solution to Code Challenges



There is no single solution to any of the coding challenges, but the requirements should be met. The project listed below contains the solution to all four code challenges.

You will need to play around with the show and hide blocks of the other sprites when you demonstrate a particular exercise. The scripts are detached from the **When green flag** clicked

so that you can snap them together when you are ready to demo a particular challenge. The sprite names correspond to their exercise number.

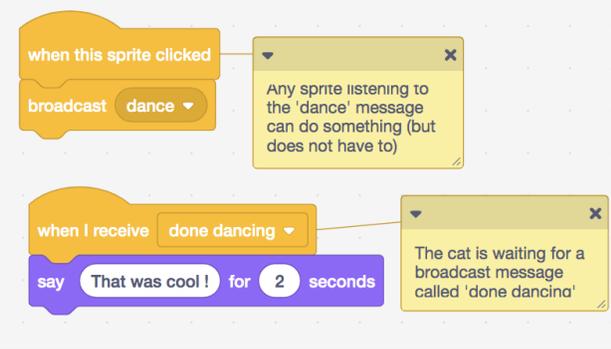
The solution project: <https://scratch.mit.edu/projects/306686644>

Explain each solution in detail, reviewing the programming concepts listed in the overview as they are encountered in the code.

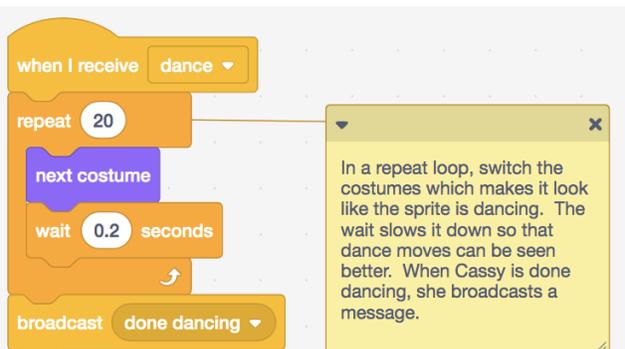
1. Concepts to review in this challenge:

- a. Event
- b. Loop
- c. Broadcast

cat sprite

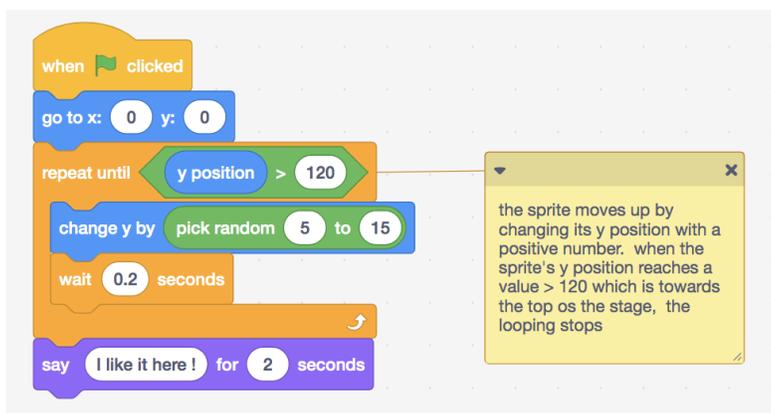


dancer sprite

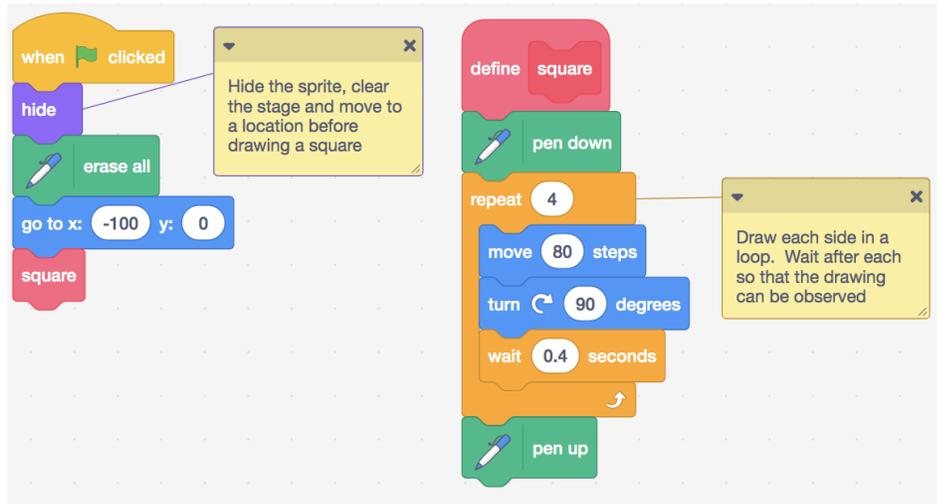


2. Concepts to review in this challenge:

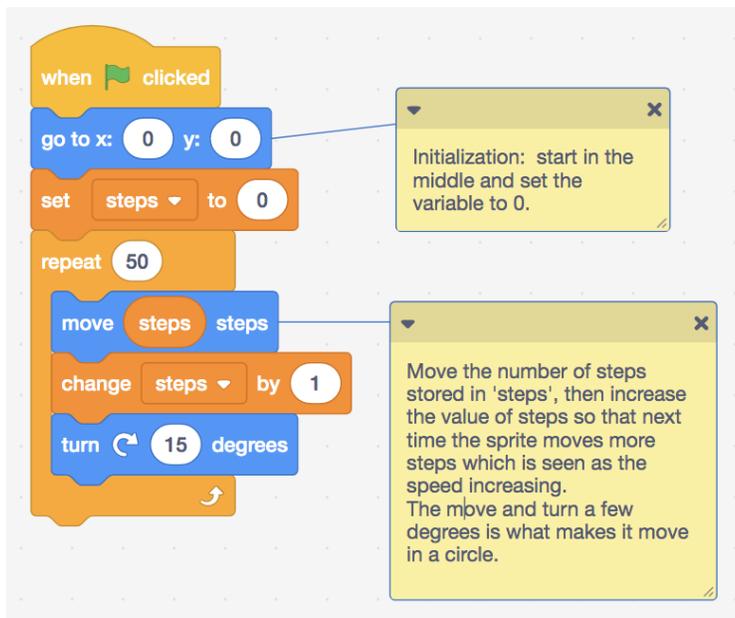
- a. Repeat until loop
- b. Conditional statement
- c. Random number



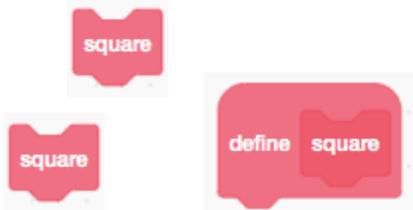
3. Concepts to review in this challenge:
 - a. Make a new block
 - b. Using the pen
 - c. The wait block



4. Concepts to review in this challenge:
 - a. Variables
 - b. Loops



Student Activity: Code Challenges

What to do:	Using/Details:
<p>Code Challenge 1:</p> <p>Remix and save.</p> <p>Whenever you click on the cat sprite, <i>Cassy</i> dances by switching costumes inside a loop that runs a few times. When she is done dancing, the <u>cat</u> sprite says: "That was cool !"</p>	<p>386412375</p> 
<p>Code Challenge 2:</p> <p>Write a script for a sprite that does the following:</p> <p>Go to the middle of the stage</p> <p>Repeat until $y > 120$</p> <p style="padding-left: 40px;">Move a random number of steps between 5 and 15 towards the top of the stage</p> <p style="padding-left: 40px;">Wait 0.4 seconds</p> <p>After the loop, the sprite says: "I like it here".</p>	
<p>Code Challenge 3:</p> <p>Create a new block that draws a square.</p> <p>When the program starts, write a script that calls the new block to draw at least 2 squares at different locations</p>	
<p>Code Challenge 4:</p> <p>Create a sprite that moves around in a circle or walks back and forth. Your choice.</p> <p>As the sprite moves, increase the speed of the sprite.</p> <p>Hint: Define a variable called "steps" and increase the value of step by a little inside the loop. Use "steps" to move.</p>	