

Practice with Conditionals

Lesson Plan

Overview

Lesson Overview Video

<https://youtu.be/AkLeEJUUGgA>

Objectives

- Students will be able to explain what a conditional is in programming.
- Students will be able to create a program that uses if/then blocks in Scratch.

Computer Science Explanation

Conditionals enable computers to make decisions based on if a condition is true or false. Conditionals are a foundational control structure that determine when specific commands are executed.

In this lesson, students review the basic ways conditionals can be used.

Standards

- **1B-AP-10** Create programs that include events, loops, and conditionals.

Example Program

- Conditional Color Squares: <https://scratch.mit.edu/projects/588207211>
- Optional Extension Programs:
 - Maze: <https://scratch.mit.edu/projects/584086399>
 - Conditionals Scene - Underwater Adventure: <https://scratch.mit.edu/projects/588221263>

Prerequisites

- Students should be familiar with conditionals, specifically the if/then block and sensing blocks in Scratch.

Materials & Tools

- [Slides](#)
- Scratch platform: for independent practice and optional full-class demo

Lesson Preparation

- The default activity for this lesson is the **Conditional Colored Squares**. If you are interested in offering your students a variety of program options, you can use one or both of the optional extension programs. For directions on these programs, you can use Slides 20-22 in the Extension Program Directions section of the slides. Here is a description of the optional extension programs:
 - **Maze:** Students use conditionals to add game mechanics to a maze.
 - **Conditionals Scene:** Students create a scene of their choice that uses conditionals to have a main sprite interact with the backdrop and other sprites.
- Depending on which program you choose, give students access to the appropriate starter code:
 - [Conditional Color Squares](#)
 - [Maze](#)
 - The Conditionals Scene does not have starter code.
- Decide if you want to review conditionals inside the Scratch editor or through the slides. You can use this [starter code](#) if you want to review inside the editor.

Vocab

Word	Definition
Conditional	A command that tells a program how to make a decision if something is true or false
Boolean	A value that can only be true or false

Agenda

- Conditionals Review (10 mins)
- Program Creation (15-20 mins)
- Showcase and Closing (5-10 mins)

Lesson Details

(Slides 2-4) If desired, introduce the objectives and computer science vocabulary.

Conditionals Review (10 mins)

(Slides 5-14) Use the slides to review key ideas about conditionals in Scratch. Alternatively, you can ask the questions in the slides while displaying the Scratch editor with [this starter code](#). This enables you to test out student responses in real time.

- Note that the starter code has two backgrounds, one blank background and one with the green square. This will enable you to explore the difference between the conditions of “touching sprite” and “touching color.”

Check For Understanding Questions (also in the slides):

- What condition are we testing for?
- In your own words, what does this code block command the cat sprite to do?
- What will happen if the cat sprite is *not* touching the Green Box sprite?
- What if the green box was part of the background instead of a sprite? How would that change the condition?
- What happens when we wrap the if/then block in a forever loop?

Key Ideas:

- We use the blue sensing blocks for the condition of the if/then statement. The condition can either be true or false, also known as a boolean value.
- The blocks inside of the if/then block only run if the condition is true.
- If we want to check if the sprite is touching another sprite, we use the “touching mouse-pointer” block and choose the sprite from the dropdown menu.
- If we want to check if the sprite is touching a part of the background, we use the “touching color” block.
- We need to wrap the if/then block in a forever loop so that the sprite checks the condition over and over again, until we stop the program.

Program Creation (15-20 mins)

(Slide 15) Review the directions for the Conditional Color Squares activity. If you want to provide students with the option to complete one or both of the extension activities, use the appropriate slides in the Extension Program Directions section.

Circulate and support students as they work. Make sure to give students time to explore and attempt to solve problems on their own before stepping in to help. If students are working on the Conditionals Scene program, ensure that students don't spend too much time choosing their sprite and backdrop.

Common Challenges and Questions

Question/Challenge	Answer
<p>How do I add a condition for if the cat is touching a specific part of the backdrop?</p>	<p>You can use the sensing “touching color” block. Click on the color to change the color. Then, use the color dropper to choose the color of the desired part of the backdrop.</p>
<p>How do I add a condition for if the cat is touching another sprite?</p>	<p>You can use the sensing  block. Use the drop-down to choose the desired sprite.</p>

Does the order matter for my “if/then” blocks?

The computer will check the “if/then” conditions from top to bottom. Because we’re writing a simple program that just has the cat move around and say things as he touches them, the order doesn’t really matter this time around. However, it’s always important to keep the sequence of our commands in mind, especially as we begin to write more complex programs.

Extensions

- Add additional color squares as sprites or as part of the backdrop.
- Add a variable that updates whenever the sprite touches one of the squares.
- Have students complete the Maze or Conditional Scene programs.
- Maze Extensions:
 - Add more button sprites to the maze.
 - Edit the backdrop to make the maze more challenging.

Showcase and Closing (5-10 mins)

(Slide 16) Give students time to share their program with a partner or with the class. If students completed any of the extension programs, this is a great opportunity to showcase the different ways to use conditionals.

(Slide 17-18) Review the closing question with students. When reviewing the answer, emphasize the key idea that we use different sensing blocks depending on if we are checking to see if the sprite is touching another sprite or if the sprite is touching part of the backdrop.

Resources

Assessment Rubric

Category	4	3	2	1
	Advanced: demonstrates superior performance	Proficiency: demonstrates consistent performance	Moving toward proficiency/expectations	Experiencing significant difficulty
1B-AP-10 Create programs that include events, loops, and conditionals.	Student independently goes beyond the program requirements to create a unique program that uses multiple conditional blocks to program a sprite to interact with other sprites and the backdrop.	Student independently completes the program requirements by using multiple conditional blocks to create a program that has a sprite interact with other sprites and the backdrop.	Student can use conditional blocks to create a program that has a sprite interact with another sprite OR with the backdrop.	With significant support, student uses multiple conditional blocks to create a program that has a sprite interact with other sprites and the backdrop.