Lesson 1: Code Your Own Sports Game

50 minutes

Overview

In this online activity, students will learn what events are, and how computers use them in programs like video games. Students will work through puzzles making the program react to events (like arrow buttons being pressed.) At the end of the puzzle, students will have the opportunity to customize their game with different speeds and sounds.

Purpose

This lesson introduces the core CS concepts of coding and programming (using blocks), as well as simple debugging techniques. They will learn that events are very common in computer programs, especially in video games.

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In this lesson, students will develop their understanding of events by making a sports game. Students will learn to make a sports equipment object move according to arrow keys, and make noises when objects collide. At the very end, they will get to customize their game to make it more unique!

Standards

Full Course Alignment

CSTA K-12 Computer Science Standards (2017)

▶ **AP** - Algorithms & Programming

▶ **CS** - Computing Systems

Agenda

Warm Up (10 minutes)
Introduction

Main Activity (30 minutes)
Code Your Own Sports Game

Wrap Up (10 minutes)
Assessment

Extended Learning

Objectives

Students will be able to:

- Create an interactive game using sequence and event-handlers.
- Define “coding” and “computer science.”
- Identify actions that correlate to input events.
- Identify key computer science vocabulary.
- Identify places to go to continue learning computer science and coding.
- Share a creative artifact with other students.

Preparation

One Week Before Your Hour of Code

- Review the **Hour of Code Educator Guide** and **Best Practices from Successful Educators** in order to begin to plan your Hour of Code event.
- **Register your Hour of Code event** if you’d like to receive swag or classroom support.
- Review and complete the online tutorial yourself: **Code Your Own Sports Game**
- Be sure to test it first before asking your students to complete it. Check your technology and decide if you need to troubleshoot anything in advance of your Hour of Code.

One Day Before Your Hour of Code

- Print one or more of the **Exit Ticket examples** at the end of this lesson plan, or create your own.
- Each student who completes the activity should receive a **certificate**. Print one for each student in advance to make this easier at the end of your Hour of Code.
- Read the "Events in Bounce - How Do They Happen?" slide deck (to be presented to students at end of class).

Links

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

For the teachers

- **Events in Bounce - How Do They Happen?** - Slide Deck
  ▼ Make a Copy

Vocabulary

- **Code** - (v) to write code or to write instructions for a computer.
- **Debugging** - Finding and fixing problems in an algorithm or program.
- **Event** - An action that causes something to happen.
- **Program** - An algorithm that has been coded into something that can be run by a machine.

Teaching Guide

Warm Up (10 minutes)

Introduction

Setting the Stage

Welcome students to class and very briefly introduce the day’s activity.

Say: *Today we’re going to spend one hour learning to code. Has anyone here heard the term “code” before? What does it mean?*

Students might mention that a “code” is like a secret message, or that it’s related to computers in some way.

Teaching Tip

One way to introduce the Hour of Code if you are not very familiar with coding yourself is to show one of our **inspirational videos**. Choose one you think your students will find inspiring, and share it now. For young learners, we suggest **The Hour of Code is Here**.

Explain that in computer science, “code” means a set of instructions that a computer can understand. Let students know that today, they are going to practice “coding,” “programming.” “events” and “debugging”. Define:

- Coding means to write code, or to write instructions for a computer.
- Programming, similarly, means to write code or instructions. Today, you will program with blocks on the computer (if you’re using an online tutorial) or with pen and paper (if you’re using an unplugged activity).
- Event is an action that causes something to happen.
- Debugging means to check code for mistakes and try to fix errors.

Teaching Tip

You’ll want to spend very little time front-loading or introducing your Hour of Code. Especially with young learners, it’s best to jump in as quickly as possible. Too much explanation or lecture at the beginning tends to spoil the fun, and fun is the whole point!

Ask the students to come sit down near you. Now tell them to all stand up!

Tell the students what you just did was declare an event and an action. When you say to sit down, it is an event. The action responding to this event is the class sitting down. This is the same when you ask the class to stand up. Events and actions are easily identifiable in our lives.

Some other events and actions include:

- Feeling hungry and eating food
- Stubbing your toe and yelling "Ouch!"
- Getting the basketball in the basket and scoring a point for your team!

Ask the class to come up with a couple of more events. Tell them that they will be making a game where the program will have actions associated to events that they code!

Main Activity (30 minutes)

Code Your Own Sports Game

Challenge your students to complete this **Code Your Own Sports Game** activity.

Depending on the age and ability of your students, you might consider:

- For younger students, we suggest you break your class into pairs and ask each group to work together to complete the tutorial using **pair programming**.
- For learners in the middle grades, we find that working independently on tutorials works well. Sometimes it helps to allow students to choose their own tutorial. If students aren't interested in Minecraft, they can get a similar experience with the **Code with Anna and Elsa** or **Star Wars** tutorials.
- For older or adult learners, the **Code Your Own Sports Game** tutorial works extremely well either as an independent challenge or a pair programming activity.

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1 2 3 4 5 6 7 8

At the end of the set of puzzles, students will have the opportunity to make their game unique. Have the students try new ways to make the game more challenging. For example, try playing with many balls at once, or each time the ball bounces off a wall, launch more balls.

If a group or individual finishes early, they can attempt another tutorial by visiting **code.org/learn**.

Teaching Tip ▲

Remind the students to only share their work with their close friends or family. For more information watch or show the class **Pause and Think Online** Video..

Wrap Up (10 minutes)

Assessment

Present the **Events in Bounce - How Do They Happen?** slide deck to students. Allow them to record the correct order of events on the second slide in their journals first. Call on a few students to share their answers before revealing the third slide. Discuss the correct sequence with the class.

Teaching Tip ▲

Although introduced in this lesson, the slide deck "Events in Bounce - How Do They Happen?" can be applied more generally to express the relationship between hardware and software. Particularly, the final slide simplifies the input-to-output sequence and can be made into a poster for your classroom.

Correct Order: D, B, A, C

Extended Learning

Debrief

Ask students to reflect on the day's activities. What did they learn about coding? Programming? Debugging? Events? How do they feel about computer science and coding after spending one hour exploring?

Celebrate

Explain that you are spending one hour coding today, because this week is CS Education Week, and millions of other students across the globe have also been participating in one Hour of Code this week. Congratulate students on being part of this world wide movement.

Give each student a **certificate** with his or her name on it.

Next Steps

Let students know that if they enjoyed today's activity, they have many options for continuing to code. Encourage students to visit code.org/learn for a list of options, or, if you're planning any of the extension activities that follow, tell students what's coming next in your classroom.

Beyond the Hour of Code

After your Hour of Code ends, there are many ways to continue teaching computer science in your K-5 classroom. Here are some ideas:

- **Teach the Code Studio Computer Science Fundamentals courses**. These six courses are designed for young learners. Students work their way through a series of puzzles that teach them to code, and educators have access to engaging lesson plans that help make the learning coming alive. Code.org offers free professional development for these courses, online or in-person.
- **Visit You can Teach Computer Science** for more course suggestions.
- **Invite a computer science expert to talk to your class about his or her work**. Don't know any local computer scientists? Reach out to a volunteer on our **volunteer map**

Take Me Out to the Ball Game

Take the students outside to play some sort of ball game. Keep track of events and actions. For example, not dribbling in basketball results in a traveling foul and the other team gets the ball. In soccer, kicking the ball out of bounds results in the other team kicking the ball in. Getting the ball to the goal results in a point! Make up more events if your students are into it. Have the all of the students yell "Yippee" when the captain of one team scores a point. Have everyone fall to the ground and roll around if a student makes two goals in a row!