Hour of Code with Swift Playgrounds

Facilitator Guide

Welcome

Celebrate Computer Science Education Week in your school or community group by leading your own Hour of Code event with Swift Playgrounds on iPad. The Hour of Code is a nationwide initiative by Computer Science Education Week and Code.org to introduce millions of students to one hour of computer science and computer programming.

We believe coding is an essential skill. Learning to code can teach us how to solve problems and work together in creative ways. And it helps us build apps that bring ideas to life.

For first-time coders, we built Swift Playgrounds, a free iPad app that makes getting started with coding fun and interactive. Using real code, your participants can solve puzzles and meet characters they can control with just a tap.

This guide will help you set up and facilitate an Hour of Code experience using Swift Playgrounds. Activities require participants to read and write code, and solve strategy puzzles independently.*

*For younger students, check out the Hour of Code materials on www.code.org/learn.

What you'll need

An iPad running iOS 10 for each participant is recommended.† Participants can also share iPad devices and code together.

The Swift Playgrounds app. Download here.

Optional: Display for guiding participants through the activities.

†Requires iOS 10.0 or later. Compatible with iPad Air or later, iPad mini 2 or later, and all iPad Pro devices.

Before the event

1. Plan and invite

- Set a date and find a location for your event.
- Announce your event to teachers, parents, and your community on social media using the hashtags #HourOfCode or #SwiftPlaygrounds.
- Invite your group to attend.
- Explore more tools to promote your Hour of Code event.

2. Prepare

Here are some things you can do to prepare in the days leading up to your event.

- Watch these helpful videos on iTunes:
  - Introduction to Commands
  - Introduction to Functions and Loops
  - Commands
  - Did You Know? Hints
- Explore the first few puzzles in the Issuing Commands, Functions, and For Loops chapters of the Hour of Code challenge in Swift Playgrounds.

3. Set up the iPad devices

To get ready for the Hour of Code, follow the steps below to prepare the iPad devices. If you're using school-owned iPad devices, work with your IT admin to install Swift Playgrounds.

Participants using their own iPad devices will also need to follow these steps to prepare for the event:

1. Download the Swift Playgrounds app.
2. Open the Swift Playgrounds app.
3. On the Featured page, tap the Hour of Code challenge.
4. Tap Get, then tap Open.
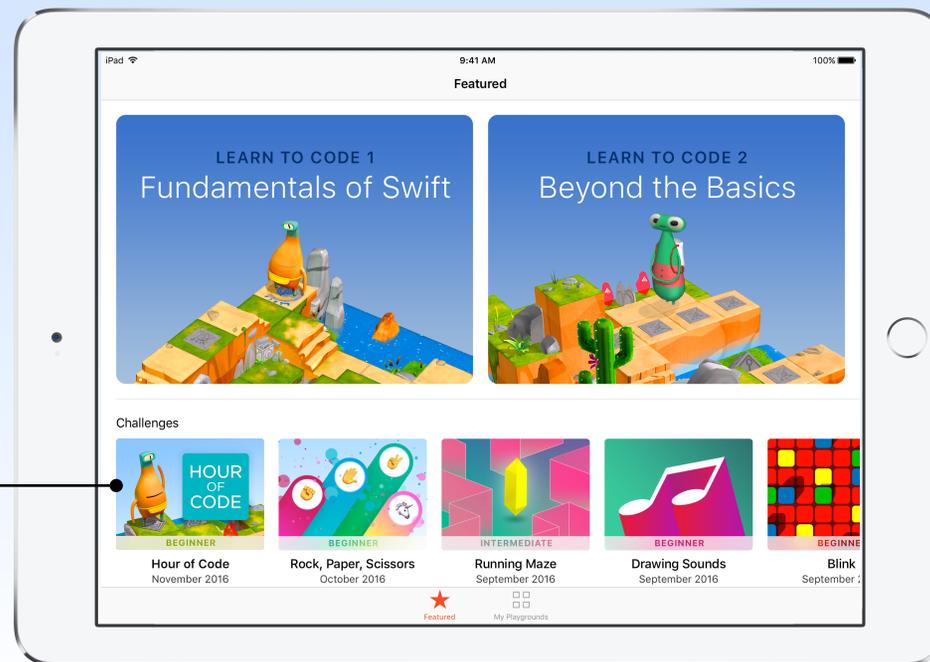
Tap the Hour of Code challenge.

Event Overview

During the event

Intro (5 minutes)

Welcome your group to the event and take a few minutes to introduce coding and Swift Playgrounds. Remind participants how code powers virtually everything around us. When you want a pizza, code places your order online. And when you use your favorite apps, code lets you send a message, share a photo, or swap faces with your cat in a photo.

If you have a video display or projector, show this inspiring video about how developers got their start (four minutes, includes sound).
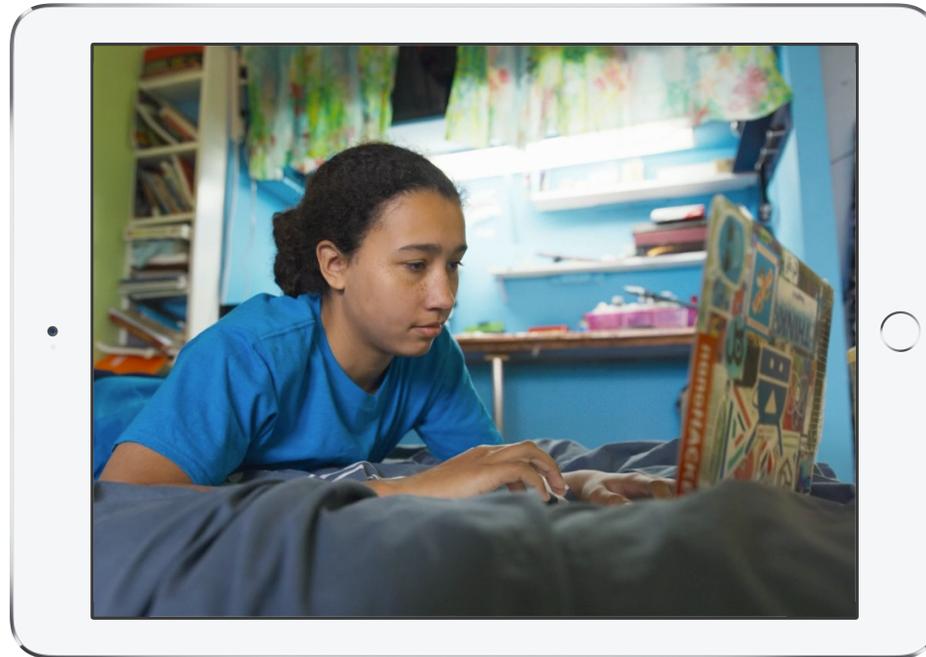
Explain that Swift Playgrounds is an app for iPad that helps you learn and explore coding with Swift, the same powerful programming language used to create popular apps for the App Store.

Warm-up Activity: Commands and Sequences (5 minutes)

Help participants understand the concept of commands and sequences. This Introduction to Commands video demonstrates the activity.

Your participants get to tell you what to do! Have the group come up with ideas for an action that requires multiple steps. For example, they could have you draw a smiley face on the board or do five jumping jacks. The goal of this activity is for participants to understand the level of detail and precision needed when coding.

Examples

Draw a smiley face on the board.

1. Walk to the board.
2. Pick up a marker with the tip facing down.
3. Take the cap off the marker.
4. Draw a circle on the board...and so on.

Do a jumping jack.

1. Stand with your feet together and arms at your side.
2. Jump and land with your feet two feet apart and lift your arms straight up in a V shape...and so on.

Let your participants decide on the action **without telling you what it is**. Once they've decided, they can shout out step-by-step directions to you. Follow their directions exactly, even if it means doing the action incorrectly.

Before moving into the app, lead a brief discussion about the activity. Every day we do things without thinking about all the steps needed to accomplish them, so it can be challenging to communicate each step to another person or to a computer when coding.

Ask the group:

• Were they successful with their commands?

• How could they improve the directions?

• Did they encounter any funny moments or problems with their instructions?

• What could they have done to avoid the issues?

Now we'll use these concepts in the Swift Playgrounds app.

Issuing Commands (15 minutes)

In the Swift Playgrounds app, tap to open the Hour of Code challenge. As a group, go through the Introduction section for the Commands chapter. The introduction will explain the concepts and relate them to everyday life. Then guide the participants through completing the next four puzzles in the Commands chapter. Let them know that it's OK if they don't complete all the puzzles in the allotted time.

- Issuing Commands
- Adding a New Command
- Toggling a Switch
- Portal Practice

Tap the Table of Contents icon to return to the Introduction, or to jump to other pages in the challenge.
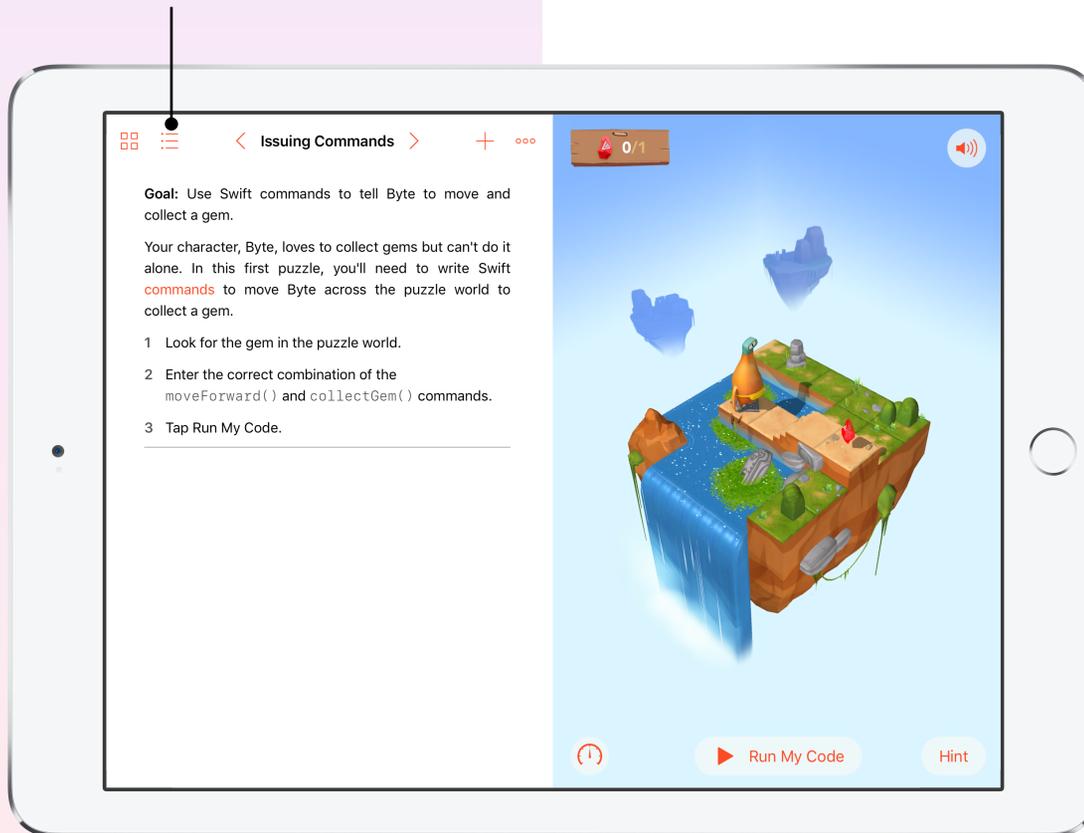
Regroup and review the experience together:

- How many commands did they write?
- How many ways could they solve each puzzle?
- Have students think about a digital game they play, then name a few commands in that game.
- How does thinking like a computer compare to thinking like a human?

Issuing Commands

Goal: Use Swift commands to tell Byte to move and collect a gem.

Your character, Byte, loves to collect gems but can't do it alone. In this first puzzle, you'll need to write Swift commands to move Byte across the puzzle world to collect a gem.

1 Look for the gem in the puzzle world.

2 Enter the correct combination of the `moveForward()` and `collectGem()` commands.

3 Tap Run My Code.

Run My Code

Hint

Functions (20 minutes)

Walk through the introduction for the Functions chapter in Swift Playgrounds. Explain that a function is a collection of commands grouped together and given a name. That set of commands can then be run using just the name of the function whenever the set is needed. Functions can help us write code more efficiently.

Now have your group work on the following three puzzles in the Functions chapter without your guidance; let them know that this is an opportunity to work independently or with a partner, applying what they've learned:

- Composing a New Behavior
- Creating a New Function
- Slotted Stairways

Regroup and review the experience together:

- When and why should you create functions?
- What are some other everyday functions?

For Loops (10 minutes)

Show the For Loops introduction, then get the group started with "Using Loops." Participants can work independently or with a partner.

Regroup and review the experience together:

- When and why should you create loops?
- Can you think of other loops in everyday life?

Wrap-up (5 minutes)

Congratulate your group for completing their Hour of Code with Swift Playgrounds. At the end of the session, show them how to use the Table of Contents to see their Swift Playgrounds Hour of Code participation certificate. Remind them that they can keep learning by downloading the Learn to Code 1 and 2 playgrounds. Encourage them to keep coding so that one day they can build apps that bring their ideas to life.
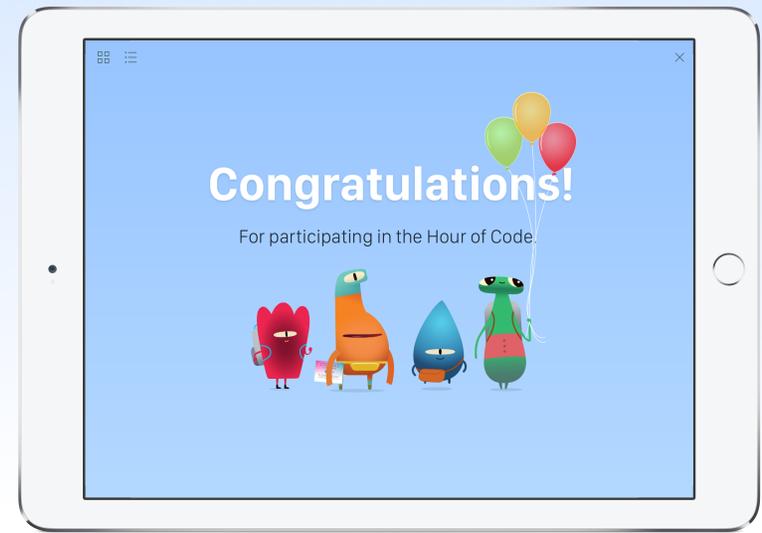
Next steps

Everyone Can Code is a program designed to give everyone the power to learn, write, and teach code. We've created free teaching and learning materials that make it easy to continue coding with Swift. Tap the links below to explore these resources.

For middle school and above on iPad

- Swift Playgrounds is a free app for iPad for first-time coders with a complete set of Apple-designed Learn to Code lessons that make getting started fun and interactive.

- Swift Playgrounds: Learn to Code 1 & 2 Teacher Guide provides lesson plans, evaluation rubrics, downloadable presentations, and more to help any teacher bring Swift Playgrounds into the classroom.

- Video Lessons for Swift Playgrounds on iTunes U is a great new course that features helpful videos for anyone learning or teaching with Swift Playgrounds. Videos include classroom lesson instruction, puzzle overviews, and hints for making the most of the Learn to Code curriculum.

For high school and above on Mac

- App Development with Swift is a Multi-Touch book that presents students with the tools, techniques, and concepts needed to build iOS apps from scratch using Mac.

- App Development with Swift: Teacher Guide is designed for use with high school and college students who are new to programming. It provides lesson activities, presentation tips, and student reflection questions.