Hour of Code with Swift Playgrounds

Facilitator Guide

```swift
func hourOfCode() {
    foldOrigami()
    learnFunctions()
    solvePuzzles()
    doDance()
}
```

Welcome

Celebrate Computer Science Education Week in your school or community group by leading your own Hour of Code event with iPad.

This facilitator guide will help anyone set up and lead an Hour of Code experience with Swift Playgrounds, a free iPad app that makes getting started with coding fun and interactive. Using real code, participants with a fourth year reading level and higher can solve puzzles and meet characters they can control with just a tap.

In this Hour of Code experience, participants will explore a modified lesson from the new Everyone Can Code curriculum, learning not just how to code, but also how code is used in everyday life.

Hour of Code is a nationwide initiative by Computer Science Education Week and code.org. Learn more about the Hour of Code initiative here.
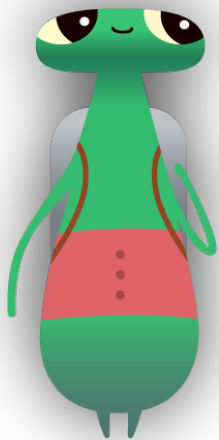
> Hi! I'm Hopper, a character in Swift Playgrounds named after Grace Hopper — a pioneer in computer science. In celebration of her birthday, Computer Science Education Week takes place each year in early December. To honour her, change the character in Swift Playgrounds to me, *Hopper*. When you start your puzzle, tap Byte, then invite me into your coding world!

What you'll need

Swift Playgrounds requires a 64-bit iPad with iOS 10 or later or iPadOS. An iPad for each participant is recommended. Participants can also share iPad devices and code together.

The Swift Playgrounds app. Download here.

Display for guiding participants through the activities.

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, #EveryoneCanCode, or #SwiftPlaygrounds. Include Apple in your conversation by tweeting @AppleEDU.
- Invite your group to attend.
- Explore more tools to promote your Hour of Code event.
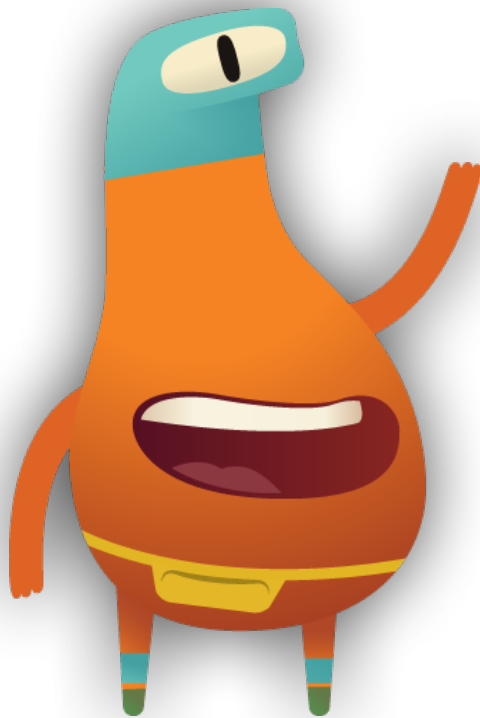
2. Get ready.

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

- Explore these chapters in the new Everyone Can Code Puzzles Teacher Guide:
  – Commands
  – Functions
- Explore the first few puzzles in the Commands and Functions chapters of Learn to Code 1 in Swift Playgrounds.
- Experiment with programming a MeeBot character in the MeeBot Dances playground in Swift Playgrounds.
- Download the Hour of Code with Swift Playgrounds presentation you'll use to guide participants through the activities.

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

1. Download the Swift Playgrounds app.
2. Open the Swift Playgrounds app.
3. On the My Playgrounds screen, tap See All. Find the Learn to Code 1 playground.
4. Tap Get, then tap the playground to open it.
5. Scroll to From Other Publishers, select UBTech Jimu Robots and tap Subscribe.
6. Tap Get to download the MeeBot Dances playground.

Note: You'll also need a square piece of blank paper for each participant and a screen to project the Hour of Code with Swift Playgrounds presentation. Download the presentation >
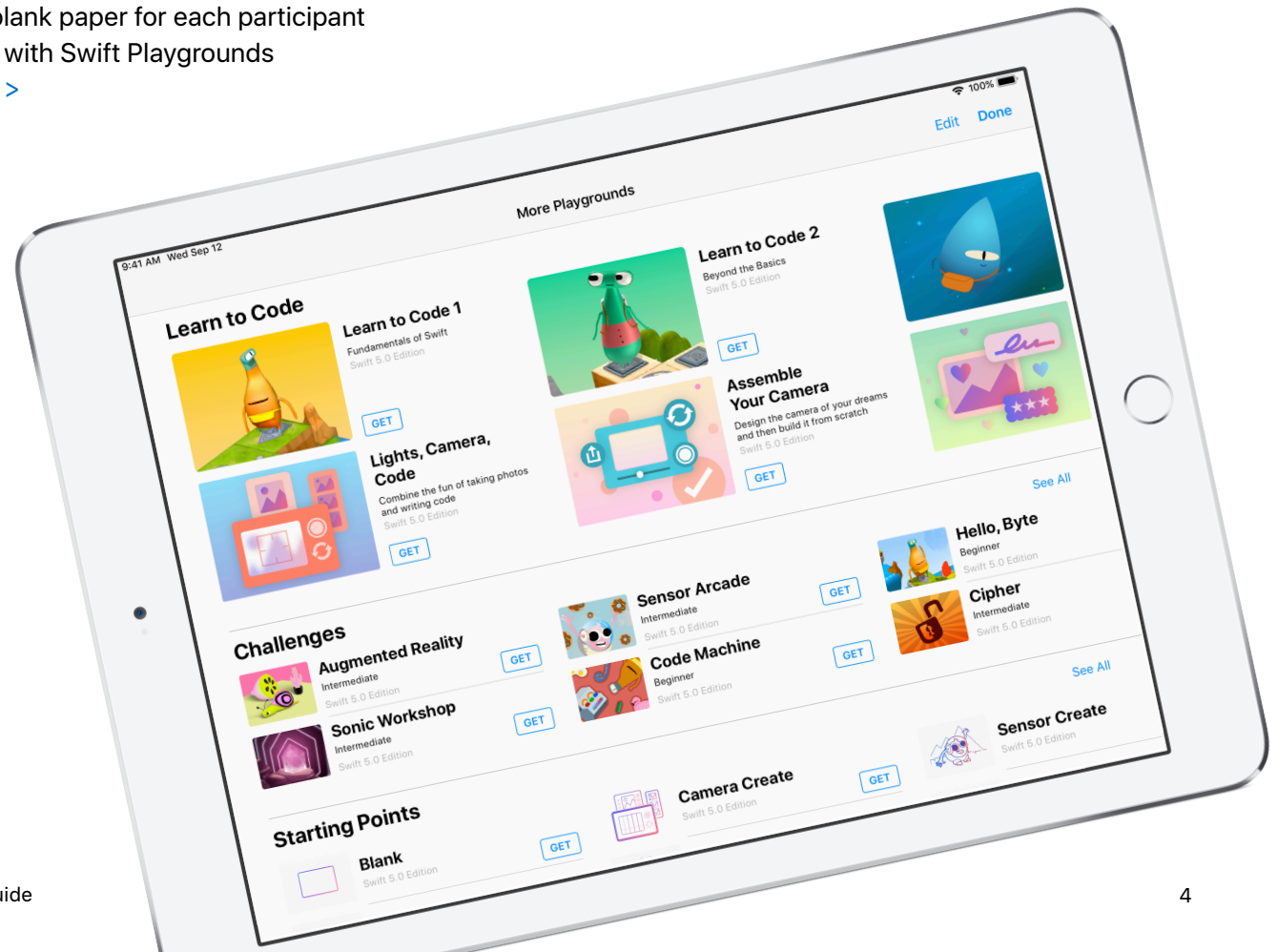
Event Overview

- **Introduction** (5 mins)

- **Learn:** Commands and Functions (10 mins)

- **Try:** Swift Playgrounds puzzles (20 mins)

- **Apply:** MeeBot Dances video (15 mins)

- **Connect:** Code is All Around Us (5 mins)
- **Wrap-up** (5 mins)

During the Event

Introduction (5 minutes)

Welcome the group to the session and take a few minutes to introduce coding and Swift Playgrounds. Remind participants how code is all around us, whether we're using an app on our phones or just crossing the road at a traffic light. Explain that in today's session, they'll learn not only how to code with basic concepts, but also how code is used in everyday life.

Learn: Commands and Functions (10 minutes)

Ask the group if they've ever given someone directions on how to do something, like a star jump or a maths problem. If so, they've issued a command. Explain that in this activity, they'll follow commands to create an origami fortune teller.

Display the Learn: Make a Fortune Teller slide, give everyone a sheet of square paper, and ask them to follow the instructions to create a fortune teller.

Was everyone able to create a fortune teller? Were the commands clear? Congratulate the group on being able to follow commands!

Explain the concept of a function. Remind the group of the first time they learned to brush their teeth. Show them the slide with the brushTeeth() function and explain that they've been taught each step: wet the toothbrush, put the toothpaste on, brush the teeth, rinse the toothbrush, rinse your mouth.

Once they learned the steps, they probably remembered the series of instruction as "Brush your teeth". So when they're told "Brush your teeth", they know exactly what to do. They've performed the function brushTeeth.
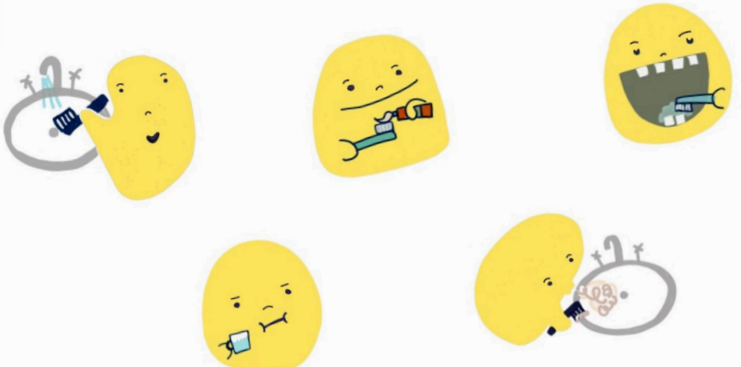

Make a Fortune Teller

1. Fold the paper in half vertically, crease, and unfold. Flip the paper over and repeat.
2. Fold the paper in half horizontally, crease, and unfold. Flip the paper over and repeat.
3. Fold the paper in half along one diagonal, crease, and unfold. Flip the paper over and repeat.
4. Fold the paper in half along the other diagonal. Flip the paper over and repeat.
5. Fold each corner into the middle. Flip the paper over and repeat.
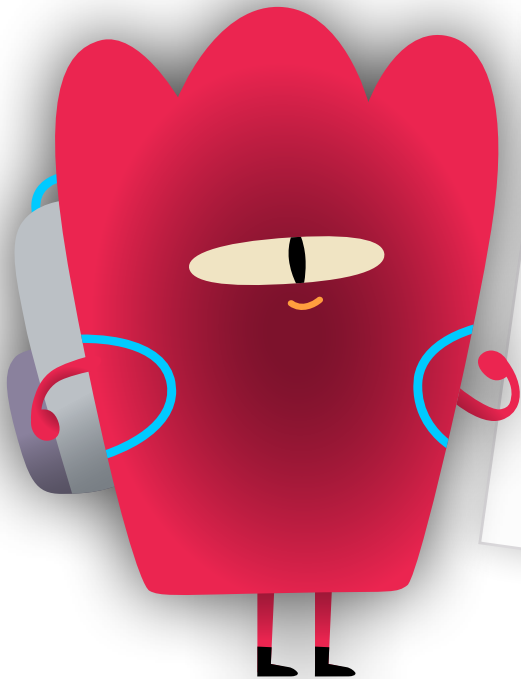6. Fold in half horizontally. Pop the fortune teller open.

brushTeeth()

Now show the group the slide with the `makeFortuneTeller()` function. Explain that this is a command in the Swift programming language. Ask whether anyone can interpret the command. Point out the use of camelCase, and have the group guess what might be inside the curly brackets. Select the Learn: Make a Fortune Teller slide to reveal the pseudocode. Select the slide with the `makeFortuneTeller()` function to show how you could call the function.

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

Learn

```
func makeFortuneTeller() {
    fold the paper in half vertically,
    crease, and unfold
    flip the paper over and repeat
    fold the paper in half horizontally,
    crease, and unfold
    flip the paper over and repeat
    fold the paper in half along one
    diagonal, crease, and unfold
    flip the paper over and repeat
    fold the paper in half along the
    other diagonal
    flip the paper over and repeat
    fold each corner into the middle
    flip the paper over and repeat
    fold in half horizontally
    pop open
}
```

makeFortuneTeller()

Try: Swift Playgrounds puzzles (20 minutes)

Have the group open the Swift Playgrounds app, then the Learn to Code 1 playground. Go through the introduction section for the Commands chapter together. It explains the specific coding concepts and relates them to everyday life.

Show participants the Try slide, then guide them through completing the next two puzzles in the Commands chapter:

• Issuing Commands

• Adding a New Command

Show them how to navigate the pages of the playground to find the Functions chapter. They can watch the introduction, then complete the first two puzzles:

• Composing a New Behaviour

• Creating a New Function

If there's time, participants can try other puzzles in the chapter.
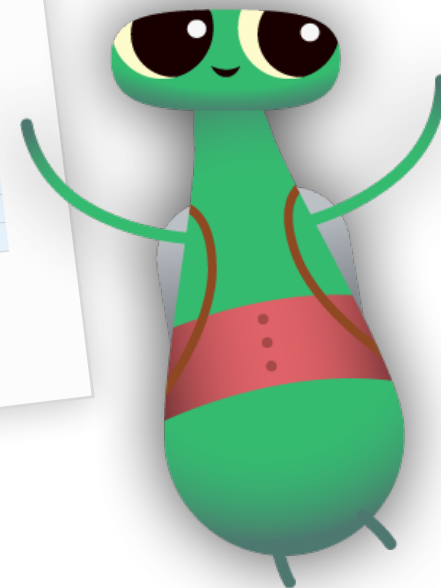
Apply: MeeBot Dances video (15 minutes)

The MeeBot Dances playground lets you program a virtual MeeBot character to dance. If you happen to have a MeeBot robot, you can connect it to the playground!
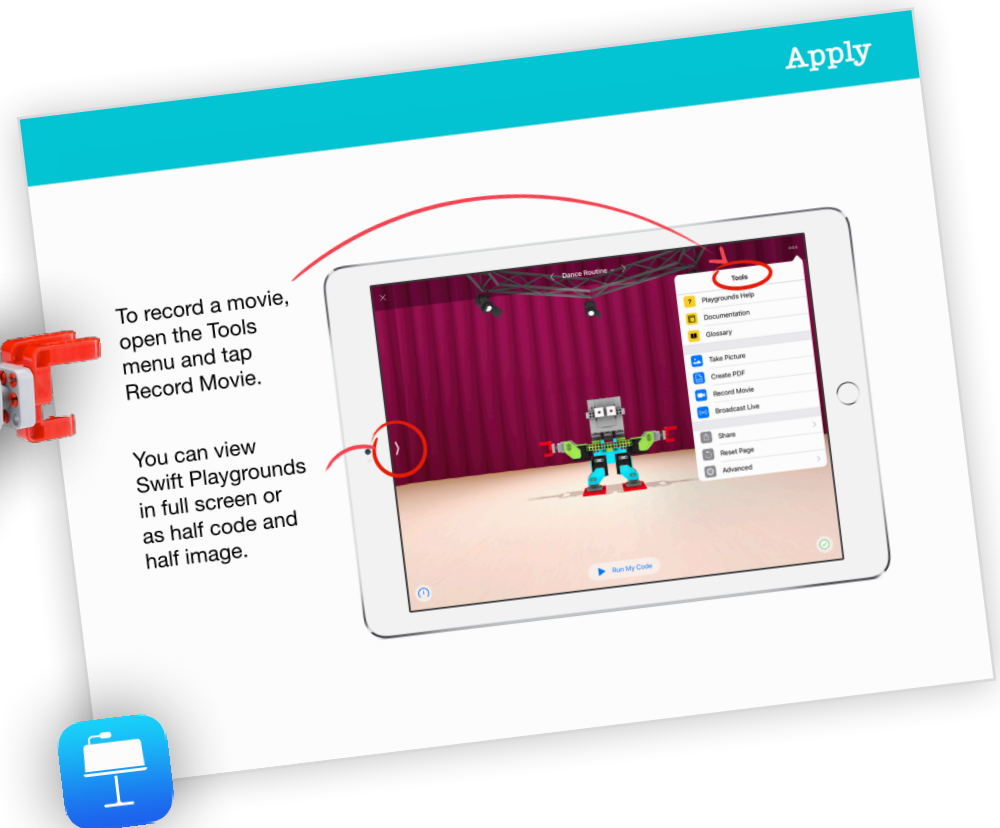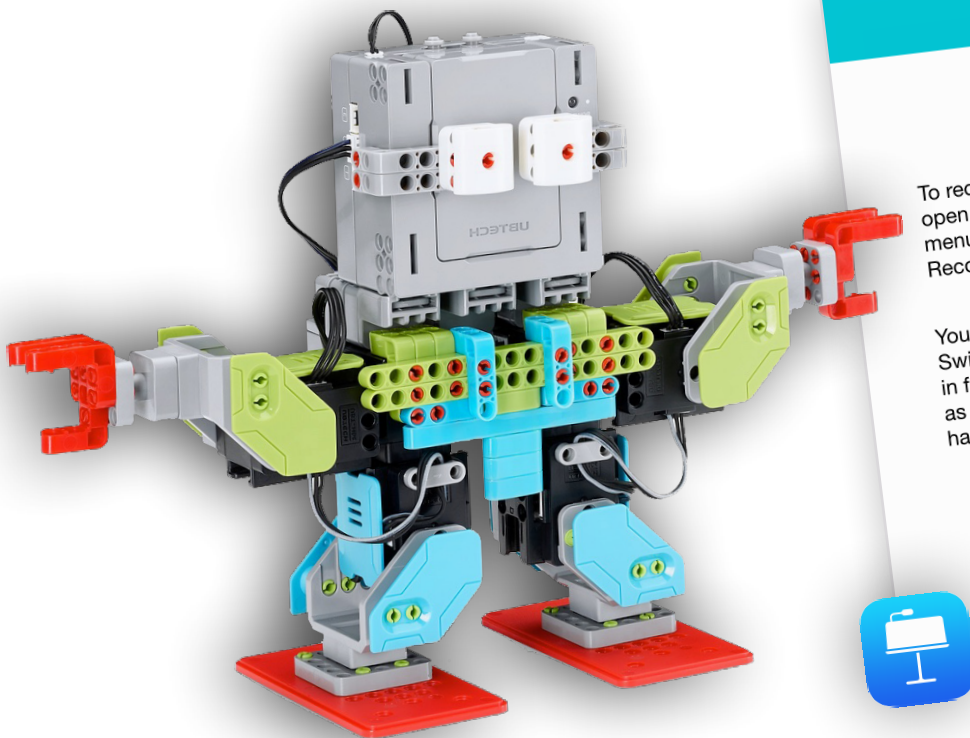
Explain to participants that in this activity, they'll program a robot to compete in a dance contest. Their challenge is to make an amazing dance video to enter their robot into the competition.

Show participants how to find the MeeBot Dances playground, and start by exploring MeeBot's dance moves on the Basic Moves page. After a few minutes, show participants how to record a movie. Have them drag the MeeBot scene to full screen, then help them find Record Movie in the Tools menu.

Now challenge them to create a dance routine function and record their dance video.

Regroup and review the experience together:

- When and why should you create functions?
- Have participants pair up to look at each other's code. Can they figure out what the dance is just by looking at the code?

To record a movie, open the Tools menu and tap Record Movie.

You can view Swift Playgrounds in full screen or as half code and half image.

Connect: Code Is All Around Us (5 minutes)

Before you wrap up the session, remind participants that code isn't just about apps and computers. They probably don't even notice how many things in their lives use code. Show them the Connect slide and discuss the commands and functions they might find in a microwave, such as a `makePopcorn()` command or a `doneAlert()` function.

Extension

If you have time or want to challenge your participants further, encourage them to find and photograph 10 objects that use code. They can add the images to a Pages document, list the commands the objects might use and try to group commands into functions. Have participants pair up to share their documents and use markup tools to add additional commands and functions.

Code Is All Around Us

Challenge yourself to spot and photograph 10 objects that use code. What commands and functions might the objects use?

Connect
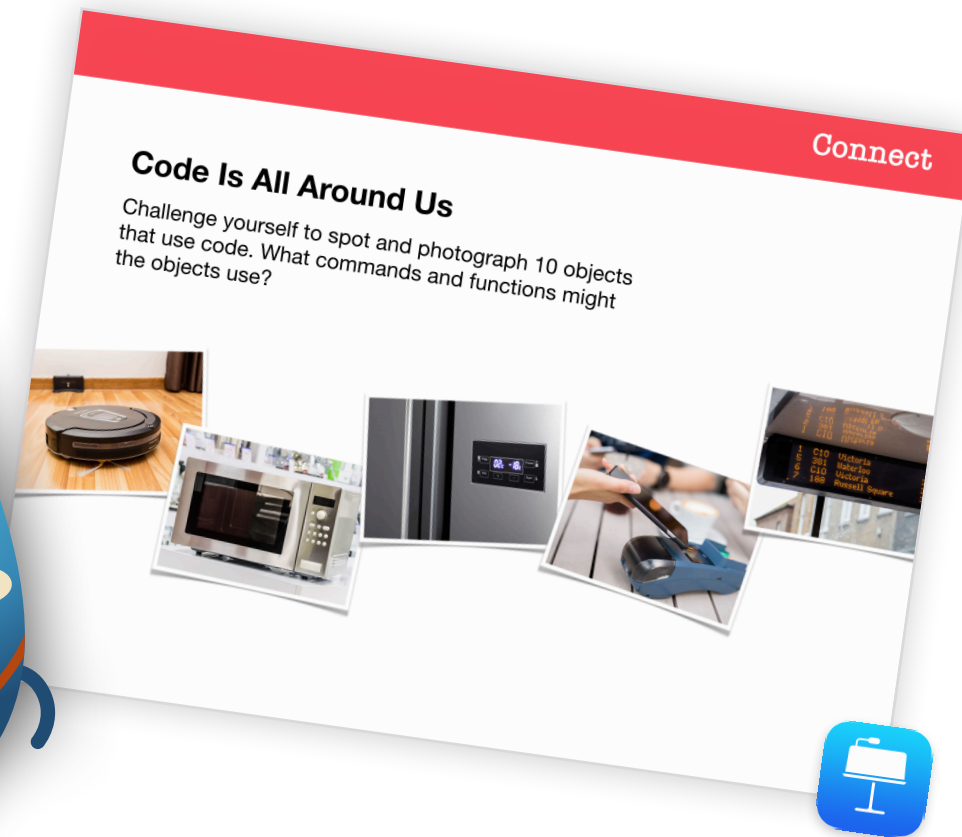
Wrap-up (5 minutes)

Congratulate your group for completing their Hour of Code with Swift Playgrounds. Show them how to use AirDrop to get their MeeBot dance routines on their own devices.

Remind them they can keep learning by downloading Everyone Can Code Puzzles and the Learn to Code 1 and Learn to Code 2 playgrounds. Encourage them to keep coding so that one day, they can create programs that can change the world.
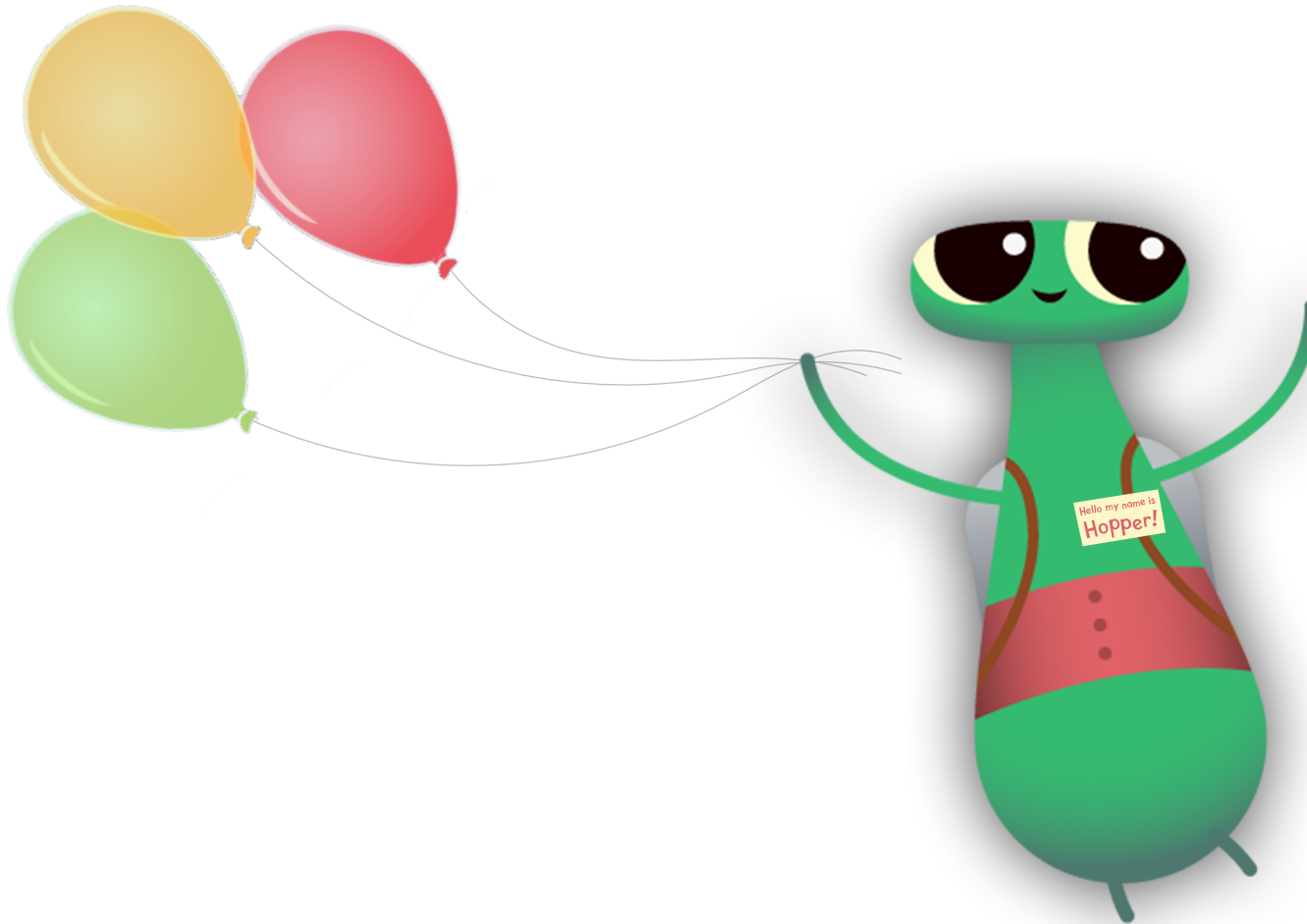
Additional Swift Playgrounds Options

If your group is already familiar with Byte, Learn to Code 1 and Learn to Code 2, here are some other options using Swift Playgrounds for your Hour of Code.
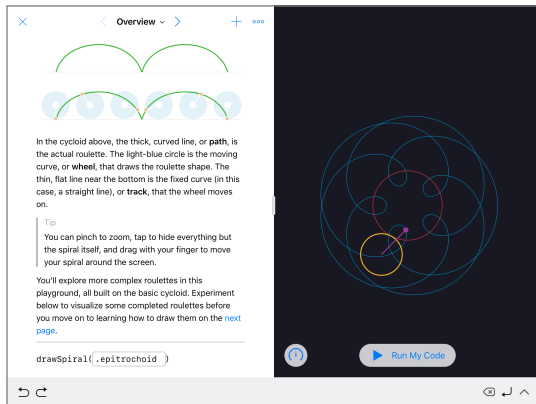
Spirals

The Spirals Starting Point lets you create your own geometric curves using code. Participants can assign colours and decimals to variables to create and alter different designs.

Once participants have explored the range of geometric shapes and patterns, challenge them to create art by entering and changing values in the code. They can capture a screenshot and use the shape they created as the basis for a company logo or whimsical design.
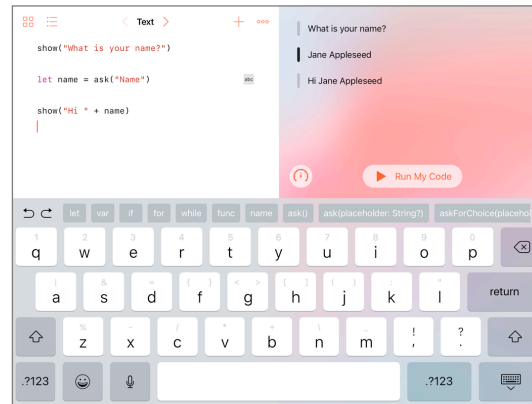
Answers Starting Point

You can use the Answers Starting Point to create anything from a quiz to an artificial intelligence chatbot. Have participants try filling in their names on the Text page. Explain that "show" and "ask" are functions. Functions can also have a result, which is what you see in the live view. On the Types page, participants can also explore different "show" and "ask" functions.

Once they're familiar with Answers, have them write a series of different "show" and "ask" functions for a friend to complete. They can then use the results from their functions to write a fictional story, an interview article or a short biography.
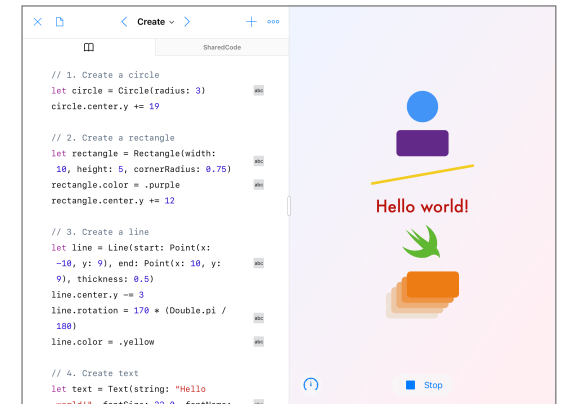
Shapes

You can place and animate objects and text that respond to touch using the Shapes Starting Point. Have participants explore the Create, Touch and Animate pages to learn how types and initialisation are used.

Challenge participants to create a project that doctors could use to improve patients' hand-eye coordination. Participants should consider how to best use the shapes and functions available to them in the Starting Point. They can test their designs with peers and think about how they might take their projects further.

Take It Further

When you teach code, you're not only teaching the language of technology. You're teaching new ways to think and bring ideas to life. And coding with Swift, Apple's powerful, intuitive and easy-to-learn programming language, provides fun and engaging ways to prepare for the future. Everyone should have the opportunity to create something that can change the world.

Hosting an Hour of Code event is just the beginning of your coding journey. Apple provides everything educators need to bring code into the classroom, whether you are just getting started with Swift Playgrounds on iPad or ready to learn Xcode on Mac.

See all the resources for teaching code >
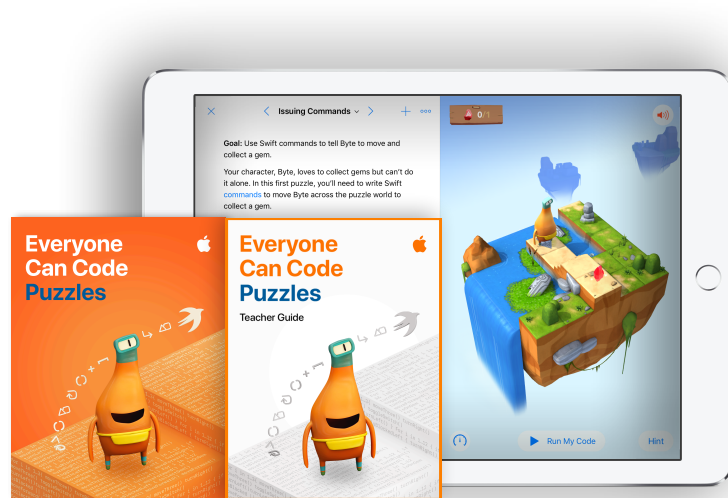
Learn more about the Everyone Can Code curriculum >
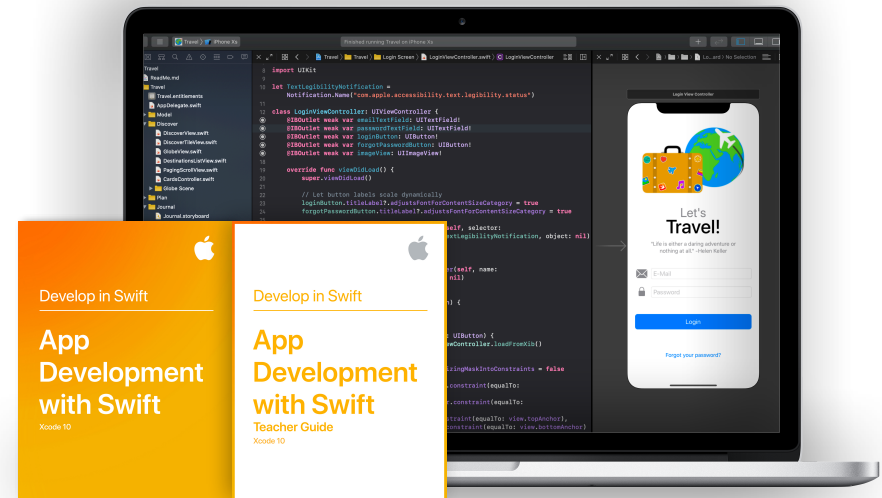
Learn more about the Develop in Swift curriculum >

Swift Coding Club

The Swift Coding Club kit provides flexible, self-paced coding activities and supports club members as they design their own apps. You don't have to be a teacher or a coding expert to run a Swift Coding Club. The kit includes everything you need to launch your club, tips and activities for designing club sessions, and helpful resources to plan and host an app showcase. Download the Swift Coding Club kit >
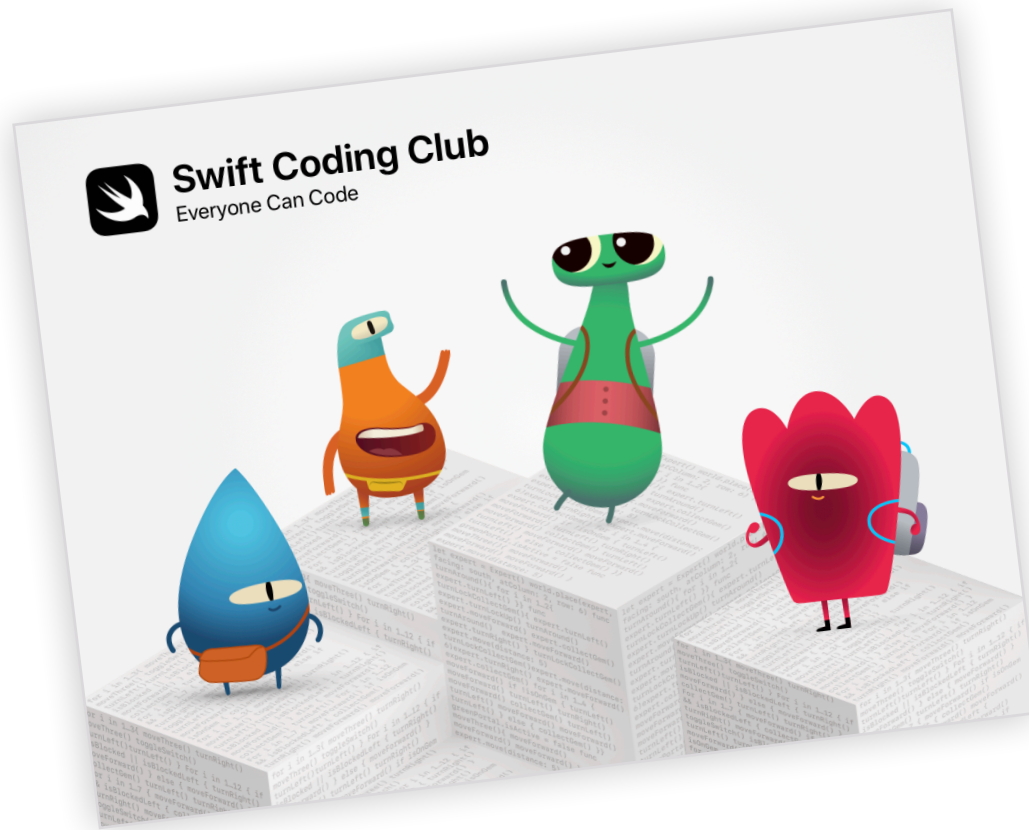
Swift Coding Club kit | **Ages 10+**

Use Swift code to learn coding fundamentals with Swift Playgrounds on iPad.