



# Hour of Code with Swift Playgrounds

2018 Facilitator Guide

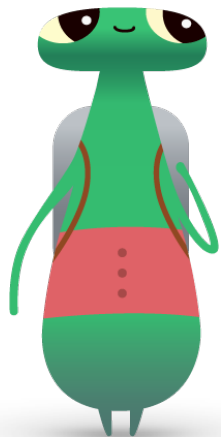
# Welcome

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 facilitate an Hour of Code experience with activities from Everyone Can Code using Swift Playgrounds, a free iPad app that makes getting started with coding fun and interactive. Using real code, participants ages 11 and up can solve puzzles and meet characters they can control with just a tap.

For younger students, you'll find information and links to a range of Hour of Code activities for block-based coding apps like Minecraft: Education Edition, Hopscotch, Tynker, and codeSpark Academy.

Hour of Code is a nationwide initiative by Computer Science Education Week and [code.org](https://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 honor her, change the character in Swift Playgrounds to me, *Hopper*. When you start your puzzle, tap Byte, then invite me into your coding world!

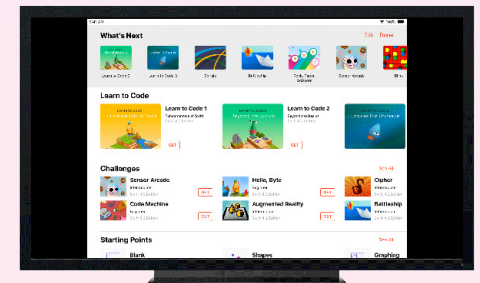
## What you'll need



An iPad running iOS 11 or later 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.

\*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. Get ready.

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

- Watch these helpful videos:
  - [Commands](#)
  - [Introduction to Functions and Loops](#)
  - [Did You Know? Hints](#)
- Explore the first few puzzles in the Issuing Commands, Functions, and For Loops chapters of the “Hello, Byte” challenge in Swift Playgrounds.

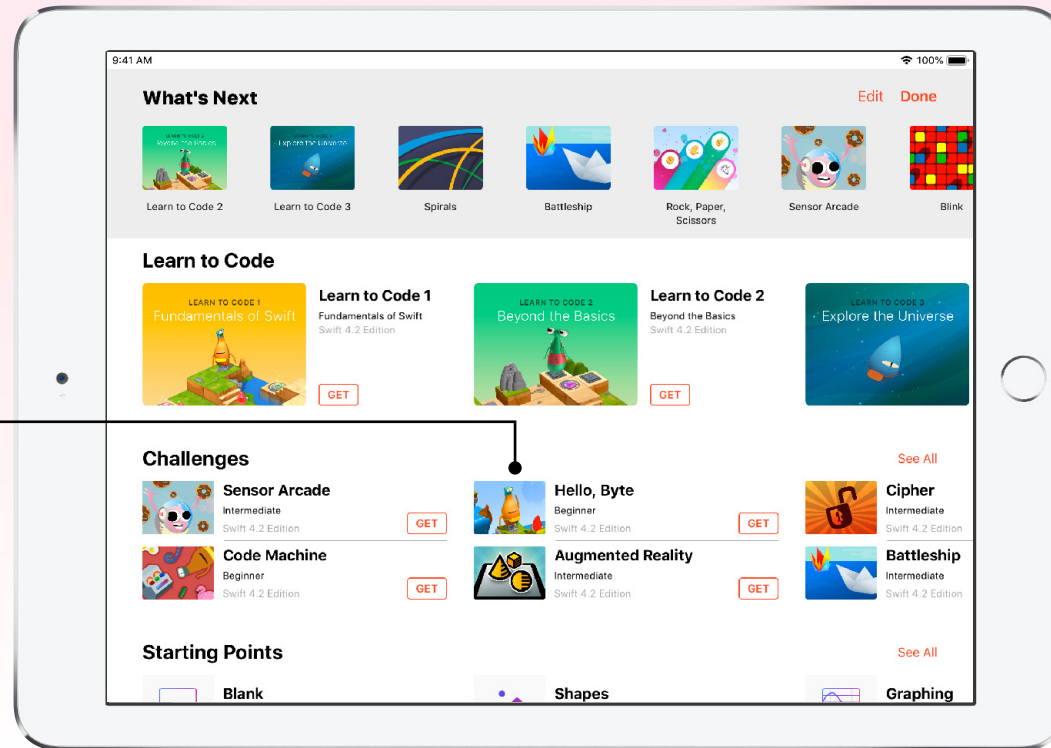
### 3. Set up the iPad devices.

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 who are 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 My Playgrounds screen, tap See All. Then tap the "Hello, Byte" challenge.
4. Tap Get, then tap the playground to open it.

Tap the "Hello, Byte" challenge.



## Event Overview

- **Introduction** (5 mins)
- **Commands and Sequences** (5 mins)
- **Issuing Commands** (15 mins)
- **Functions** (20 mins)
- **For Loops** (10 mins)
- **Wrap-up** (5 mins)

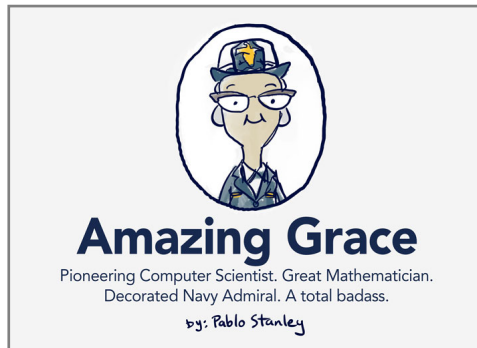


## During the Event

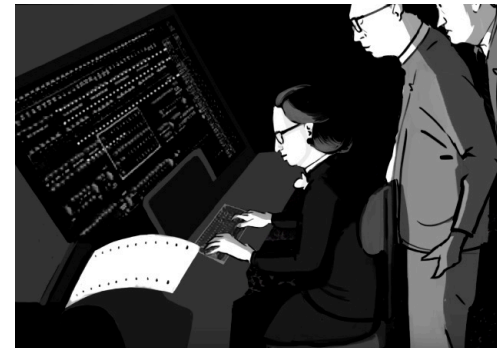
### Introduction (5 minutes)

Welcome your group to the session 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 an image, or swap faces with your cat in a photo.

Discuss with your group that Hour of Code takes place during Computer Science Education Week, which marks the anniversary of the birth of Grace Hopper, who was considered “the first lady of software.” A passionate mathematician known as “Amazing Grace,” Rear Admiral Dr. Grace Hopper was instrumental in the development of the first compilers—programs that translated English into machine code. Choose one of the materials below to highlight the impact that her work has had on coding and computer science. Discuss with students how this work can be traced to the Swift code that they’ll be working with today.



This [comic by Pablo Stanley](#), an experience designer at InVision, tells the story of Grace Hopper’s life and achievements.



This quick [video](#) from the National Museum of American History highlights Grace Hopper’s pioneering work.

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

Help participants understand the concept of commands and sequences. 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.

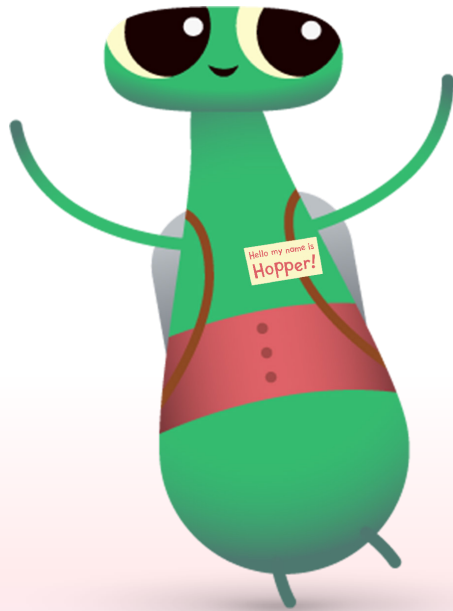
### Ask the group:

- 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.



Even though this challenge is called "Hello, Byte," your participants can change their characters. One of them is me! I'm Hopper, named after Grace Hopper. [This video](#) will show you how to change characters.



## Issuing Commands (15 minutes)

In the Swift Playgrounds app, tap to open the Hello, Byte 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.

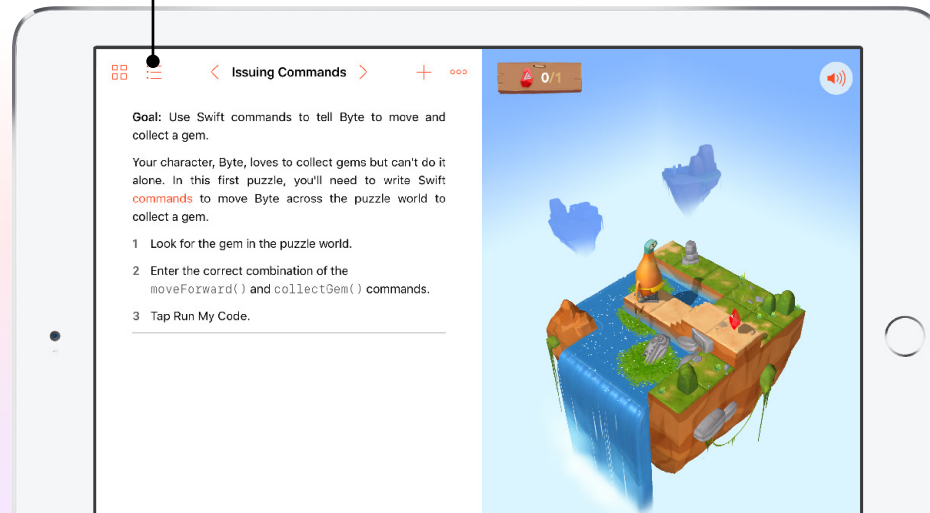
Then guide the participants through completing the next four puzzles in the Commands chapter. Let them know that it's OK if they don't complete all the puzzles in the allotted time.

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

Regroup and review the experience together:

- How many commands did participants 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?

Tap the Table of Contents icon to return to the Introduction or to jump to other pages in the challenge.



## 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:

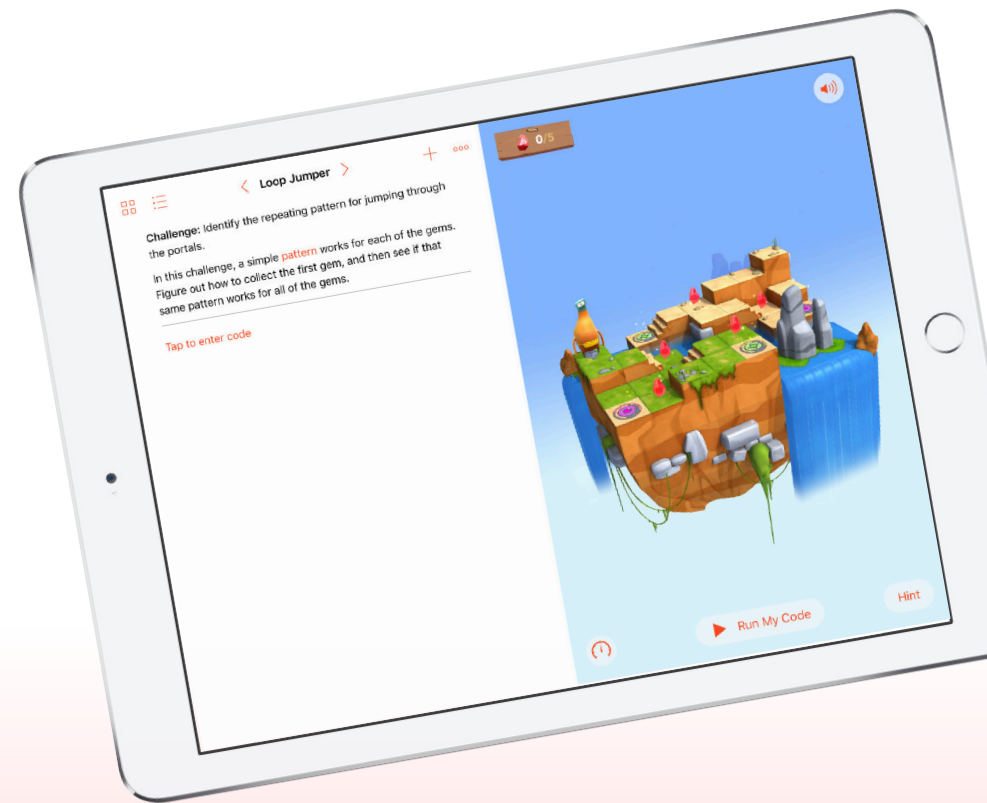
- When and why should you create functions?
- What are some other everyday functions?

## For Loops (10 minutes)

Show the For Loops introduction, then get the group started with Loops Jumper. 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?





## Extension Activity (Optional; 10 minutes)

If you have more than an hour or want to provide an extension activity for your group, invite students to choose one of these Grace Hopper quotes or images that really speaks to them. They can use Notes, Pages, or Keynote to illustrate the quotes and design new wallpapers for the Lock screen on their iPad devices during Computer Science Education Week.



"Humans are allergic to change. They love to say, 'I've always done it this way.' I try to fight that. That's why I have a clock on my wall that runs counterclockwise."<sup>1</sup>



When Grace Hopper worked in the basement of the Pentagon, her office was decorated with a Jolly Roger pirate flag.



The most dangerous phrase in the language is, "We've always done it this way."<sup>1</sup>

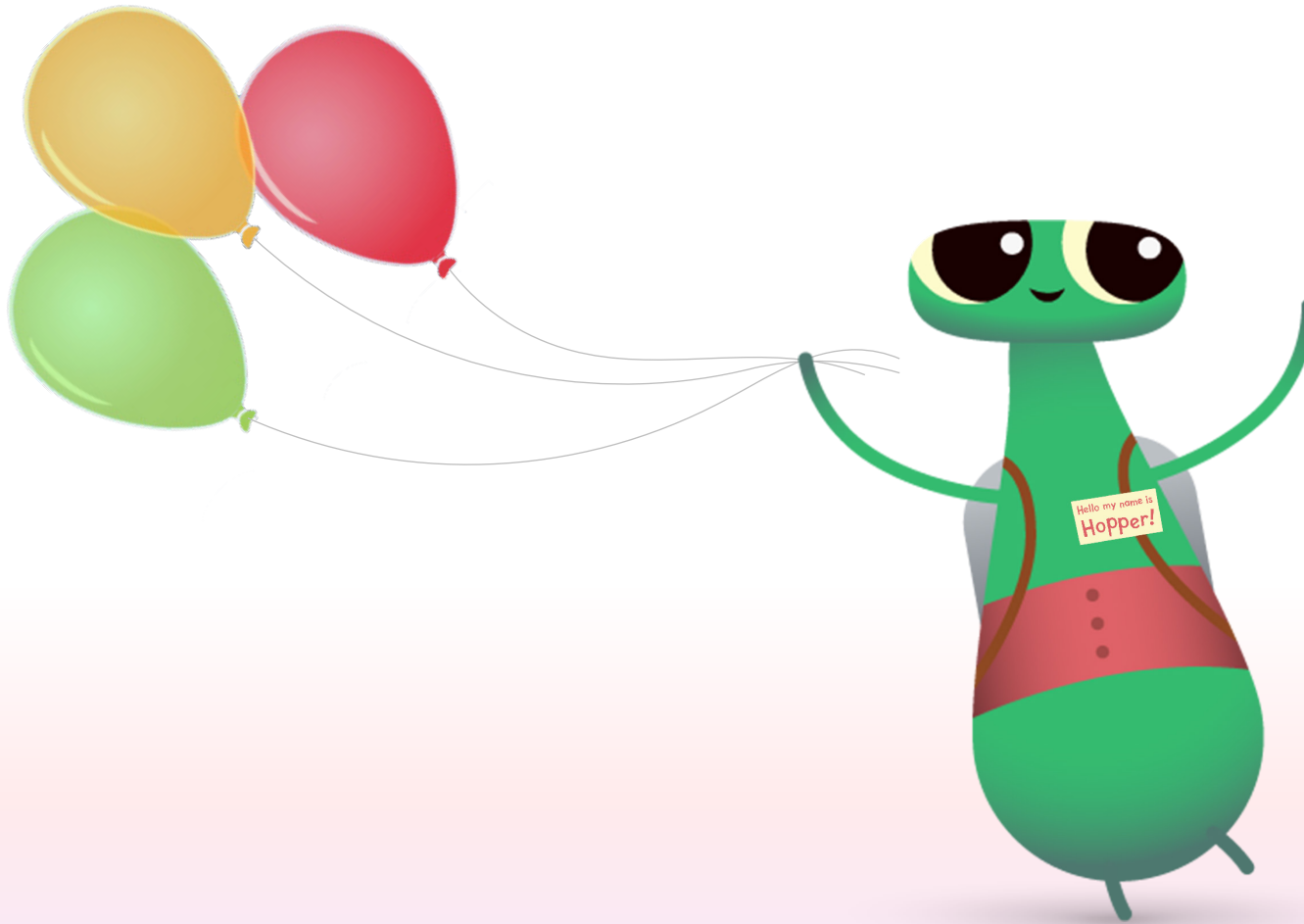
I've always been more interested in the future than in the past.<sup>1</sup>

I have insatiable curiosity. . . . Every time you solve a problem, another one shows up immediately behind it.<sup>2</sup>

1. Quotes sourced from Wikiquote. 2. Grace Murray Hopper by Lynn Gilbert, Particular Passions: Talks With Women Who Have Shaped Our Times.

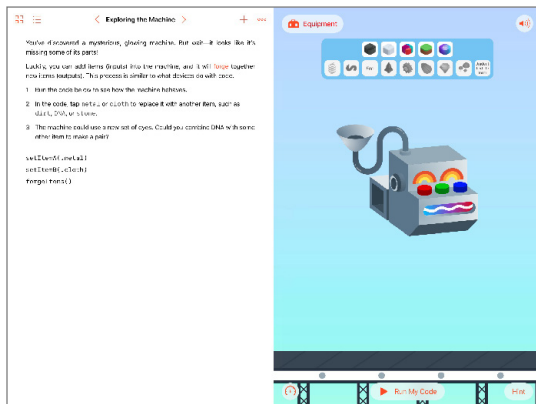
## Wrap-up (5 minutes)

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 “Hello, Byte” completion 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.



# Additional Swift Playgrounds Options

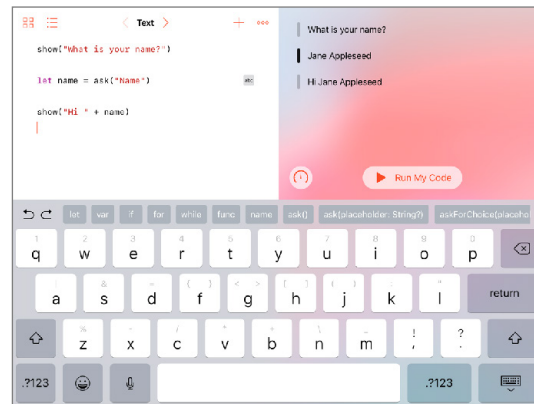
If your group is already familiar with Byte and Learn to Code 1 and 2, here are some other options using Swift Playgrounds for your Hour of Code.



## Incredible Code Machine

Explore The Incredible Code Machine together and learn what it can do and how it works. The machine is missing some parts. The challenge is to use logic and basic coding skills, like functions and loops, to figure out how to create new parts for it. By the end of this challenge, you'll have a fully restored machine, complete with customizable parts.

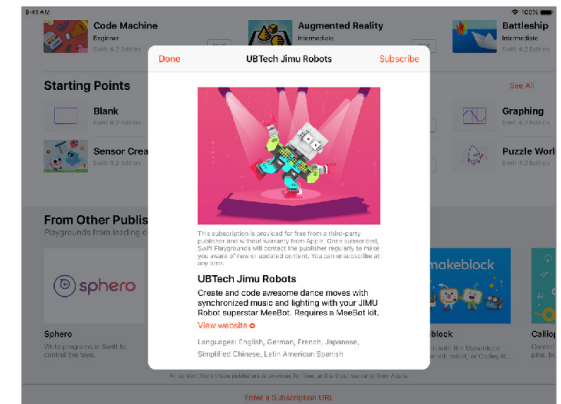
Participants may try to create more parts than needed on the beginning pages. Move them on as necessary.



## Answers Starting Point

You can use the Answers Starting Point to create anything from a quiz to an artificial intelligence chatbot. Have students 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, students can also explore different "show" and "ask" functions.

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



## Accessories

Using connected devices is a great way for students to apply their coding skills so they can see their code take shape in the real world.

Third-party developers of popular robots and devices offer Swift Playgrounds content that's filled with engaging playgrounds. Users can configure and control popular educational accessories like Sphero, Meebot, Wonder Workshop Dash, and more.

# Hour of Code for Younger Learners

If you want to host an Hour of Code with elementary school students or want to explore other options with apps on iPad, check out these Hour of Code activities.



## Minecraft: Education Edition

With this introductory lesson, Voyage Aquatic 3D, students will have fun using commands in Code Builder to decorate and populate a giant aquarium with marine creatures. Minecraft: Education Edition is available on iPad and macOS devices, and requires a school account.

[Learn more >](#)



## Tynker

This collection of 12 coding tutorials encourages kids to use their imaginations and get creative. They can create a fun game about pets, demonstrate cooking skills with an interactive recipe, design a story about how they would change the world, make a solar system model, and even build their own games.

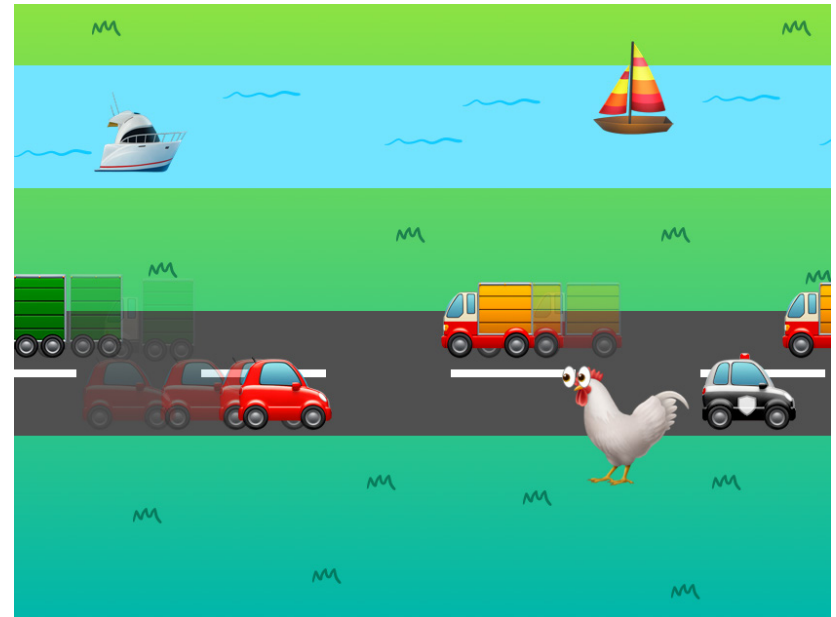
[Learn more >](#)



### **codeSpark Academy**

Students can program the adorable Foos to solve puzzles that teach fundamental computer science concepts like sequencing and loops. Or they can get started with codeSpark Academy's "Create" Mode. Two game kits guide them through creating and coding a Mario-style video game using a no-words interface. Great for beginner coders and prereaders!

[Learn more >](#)



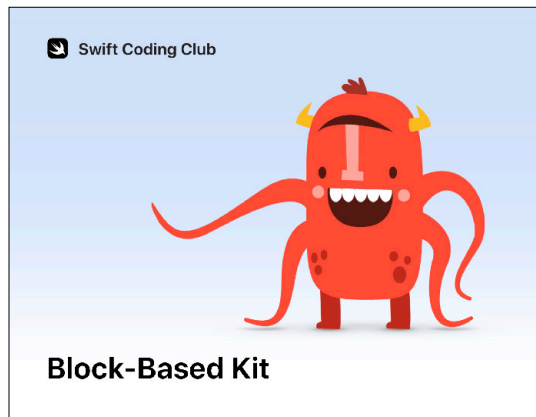
### **Hopscotch**

Young coders can choose from eight video tutorials to build their own games in Hopscotch, an open-ended coding tool that lets them create any program they can imagine. Each project comes with comprehensive Hour of Code lesson plans. Students can go even further using the full Get Started with Code curriculum, which provides explanations of coding concepts and hands-on practice with the basics of computer programming.

[Learn more >](#)

# Swift Coding Clubs

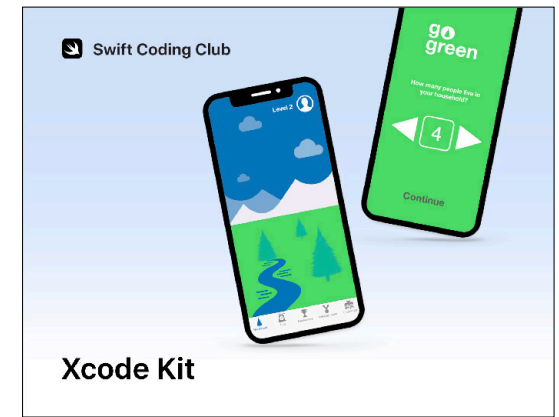
Hosting an Hour of Code event is just the beginning of your coding journey. Swift Coding Club kits provide flexible, self-paced coding activities and support club members to design their own apps. You don't have to be a teacher or a coding expert to run a Swift Coding Club. The kits include everything 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 Kits >](#)



**Block-Based Coding Kit | Ages 8 to 11**  
Learn coding basics using visual apps on iPad.



**Swift Playgrounds Kit | Ages 11+**  
Use Swift code to learn coding fundamentals with Swift Playgrounds on iPad.

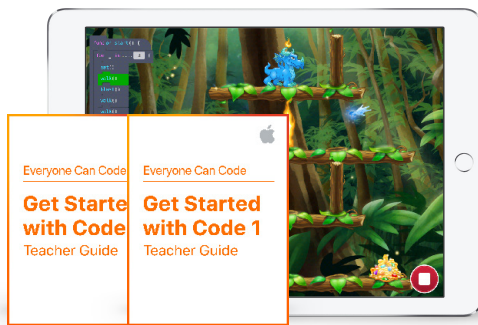


**Xcode Kit | Ages 14+**  
Learn to develop apps in Xcode on Mac.

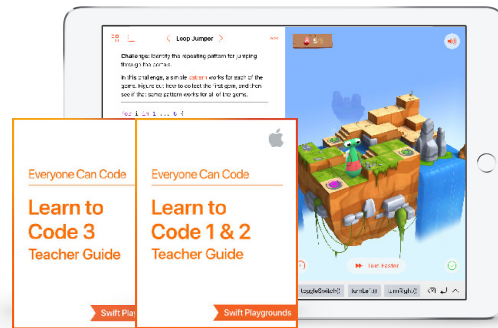
# Take It Further

The Everyone Can Code curriculum provides fun, supportive resources to take coders from learning the basics on iPad to building real apps on Mac. Comprehensive Teacher Guides also enable teachers to bring coding into the classroom, with step-by-step, curriculum-aligned lessons for students from kindergarten to college.

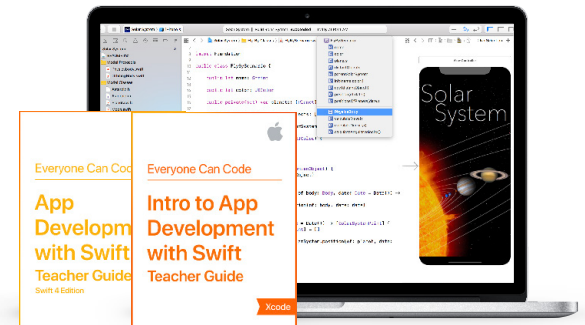
[See all Everyone Can Code resources >](#)



[Learn more about the Get Started with Code curriculum >](#)



[Learn more about the Swift Playgrounds curriculum >](#)



[Learn more about the App Development with Swift curriculum >](#)