SCHOLASTIC

CODE WORDS

READY TO LEARN ABOUT CODING? TURN THE PAGE! ⇨

Super-simple language tips

+

How to code your life

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SAY IT IN CODE

Want to learn to code? There are lots of different coding languages out there, and some of them were developed especially for kids. In fact, basic coding is so easy to pick up, you can teach it to yourself.

Code is behind everything you do on your computer and phone, like playing games and texting. The main languages that power websites and apps are called JavaScript and Python. But another language called Scratch is made for kids like you. Scratch uses simple building blocks to make commands and lets you create animated stories where you get to decide what your characters say and do. If you have access to a computer or a tablet with internet, you can code!
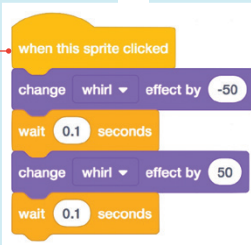
Chances are, you already know something about coding from real life. Each morning, you do certain things. You might eat breakfast, take a shower, get dressed, and then leave for school. In computer science lingo, those steps you take to reach a goal or solve a problem are called an **algorithm**. You use algorithms all the time, in fact. Doing your math homework, figuring out the fastest route to your friend's house, setting the table—they're all algorithms!

You probably go about the steps in your morning routine in the same order every day, right? Doing things in a specific order is what coders call a **sequence**. And you go through that same sequence every day. Code has a name for repeating a sequence; that's called a **loop**. You might say that out of habit you are programmed to do your morning routine the way someone might **program** a computer, using code to make it perform certain actions.

But something has to set that whole morning routine (or program) in motion—you! In coding, the moment you roll out of bed to begin the process is called an **event**. An event is an action, like tapping a keyboard or touch screen, that causes the program to respond. Scrolling through photos on a tablet or hitting the pause button on your favorite show—both of these actions are events that stimulate your device to do what you want it to do. And that's what ultimately makes coding so cool: You're the one who's in control!

```
when this sprite clicked
change   whirl ▼   effect by  -50
wait  0.1  seconds
change   whirl ▼   effect by  50
wait  0.1  seconds
```

GET WITH THE PROGRAM

You probably don't think twice about it, but examples of coding are all around you.

TRAFFIC LIGHTS
They're timed by computers to react to the flow of vehicles and keep traffic running smoothly.

A HOT SHOWER
Preprogrammed microprocessors (tiny computers) in water heaters can change the water's temperature.

ELEVATOR
The elevator at your doctor's office is coded to stop on the floor it's told. Pushing a button gives it that command.
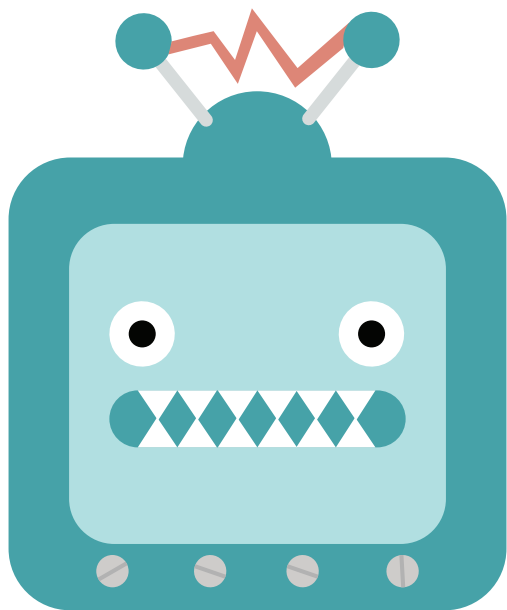
MICROWAVE
When you press a cooking time and the start button, you're triggering the code that tells the microwave to cook.

WASHING MACHINE
Maybe you've seen one with a computer panel that "senses" how heavy the load is so that it fills the drum with the right amount of water.

Bot seriously, just tell me what to do!

THINK LIKE A PROGRAMMER

Pretend that you have a personal robot to perform your most basic tasks, like packing your backpack. The thing is, your robot needs to be trained *how* to do it (or she might shove a heavy lunch box on top of your homework folder—not good!). Here's how you'd use code to tell your robot what to do.

1 You want your robot to put your lunch box in first, your books next, and your homework folder last. You'd code those tasks in a **sequence**, meaning the exact order that you want them to happen.

2 Great! You now have a robot who knows how to pack your backpack. Instead of having to write the same code every day to remind her what to do, you'd create a loop. **Looping** puts the sequence on repeat, so that your robot packs your bag the exact same way from Monday to Friday.

3 Your bookbag-packing robot is awesome. But wait a minute—now it's Saturday, and you're not going to school. So you'll create an **event** to put your robot's program on pause until Monday. Pretty clever, huh?

GREAT MOMENTS IN CODING HISTORY

1843
British mathematician **Ada Lovelace** writes the first computer program.

1854
George Boole creates Boolean algebra, laying an important foundation for coding.

1945
The first electronic computer, called **ENIAC**, is used by the U.S. military.

1959
COBOL, a programming language based on words rather than numbers, is developed by **Grace Hopper**, a rear admiral in the U.S. Navy.

1991
Dutch programmer **Guido van Rossum** creates the **Python** programming language, which simplifies coding.
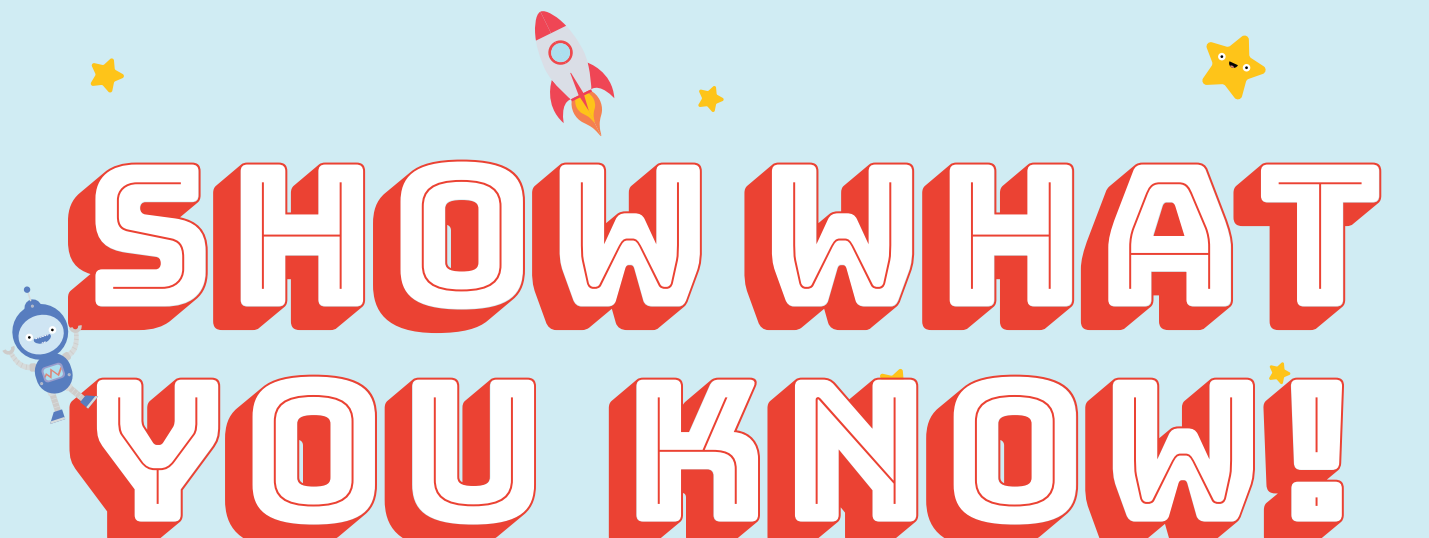
1995
James Gosling introduces **Java**, a programming language that can run on most platforms.

2013
The nonprofit group **Code.org** is founded to promote computer science in schools.

2017
Google's **DeepMind AI**, an artificial intelligence machine, beats the world's best human player of Go, a traditional board game.

SHOW WHAT YOU KNOW!

Now that you're caught up on what coding is, see if you can ace this quiz.

1. Which of these is *not* a coding term?
- **A** Program
- **B** Sequence
- **C** Score
- **D** Event

2. Which is the correct term for things happening in a certain order?
- **A** Looping
- **B** Sequencing
- **C** Blocking
- **D** Algorithm

3. Which of these things can you do with code?
- **A** Tell a story
- **B** Build an app
- **C** Create a website
- **D** All of the above

4. True or false: You can learn to code with just a computer and the internet.
- **A** True
- **B** False

5. Which of these would be an "event"?
- **A** Hitting the space bar on your keyboard
- **B** Zooming in on a map on a screen
- **C** Using your thumb to scroll through photos
- **D** All of the above

6. One of these is an example of an algorithm. Can you tell which?
- **A** Talking to a friend
- **B** Building a birdhouse
- **C** Playing in the pool
- **D** Hanging out on the couch

SCHOLASTIC

TEACHING GUIDE

CODE WORDS

Coding and ELA Activities

CODE WORDS

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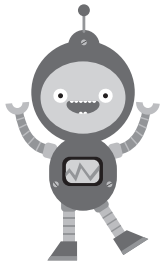
How to code your life

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HEY, TEACHERS!

In this guide you'll find:

• Lessons and activities for ELA or tech classes

• A class set of student magazines

• Links to coding activities from Google's CS First: **g.co/csfirst/scholastic**

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HOW TO USE THIS PROGRAM

These cross-curricular lessons can be used in ELA or technology classes. Students will read articles about coding in our student magazine. Then they'll create animated stories on computers using CS First's free video-based coding activities, with bonus ELA tips from Scholastic to elevate their learning even more. You don't need computer science experience to teach it—we promise!

✦ Visit **scholastic.com/computerscience** for more classroom resources.

MINI LESSON: CODING CONCEPTS

Use informational texts to teach students about the history and terminology of coding.

OBJECTIVE
Students will integrate information from multiple articles to speak with understanding about coding and support their analysis with evidence from the magazine articles.

TIME
25–30 minutes

MATERIALS
▪ *Code Words* student magazine

1 Have students brainstorm the different ways that the word *code* is used (prompts to get them started: zip code, bar code, code of honor, dress code, cracking the code). Explain that in computer science, programmers use the word *code* to refer to instructions for a computer.

2 Tell students that they will be learning to code by creating an animated story online. But first they will read several articles to learn about coding history and terminology.

3 Hand out student magazines. Have students read independently or with a partner. Challenge them to use context to better understand the bolded words as they read, and direct them to complete the quiz on the back page. *Quiz answer key: 1. C; 2. B; 3. D; 4. A; 5. D; 6. B*

4 Review the central ideas in the magazine as a class. Prompt students to identify vocabulary words in the magazine that were new to them. Go over the meanings of the words as a class. (Extension: Have students find out five more facts about one of the people in the "Great Moments in Coding History" sidebar.)

5 Explain that computer coding is about solving problems by breaking a project into smaller tasks. Prompt students to name other things they do that depend on the same kind of logic and problem-solving involved in coding (examples: following a recipe to bake a cake, learning to play a musical instrument, making a craft project). Collect a list on the board.

GET TO KNOW SCRATCH—IT'S EASY

Your students will be using a coding language called Scratch to create their animated stories. Here's what you need to know.

▪ **Scratch was developed especially for kids** by computer experts at the MIT Media Lab. It allows students to build animated stories by manipulating simple blocks of preprogrammed code that they drag and drop to create commands.

▪ **It's great for beginners.** Scratch helps kids grasp basic computer science concepts like systematic reasoning and creative thinking in a fun way.

▪ **It's built right into CS First's coding activities.** When students start a video on the CS First site, Scratch will open automatically in a separate tab. To learn more, go to **scratch.mit.edu.**

OK, NOW LET'S CODE!

Choose one of these short coding activities. We've added bonus ELA connections so you can integrate the activity into your English, social studies, or history curriculum.

MATERIALS
Computers or laptops with internet access

Note: Students can work in pairs if you have limited computer access at your school.

TIME
45–60 minutes

< CODING ACTIVITY 1 >

ADVENTURE ON THE HIGH SEAS

Try the Adventure on the High Seas activity (**g.co /csfirst/scholastic-adventure**) on the CS First site. Students will pick two "sprites," or characters, place them in a boat, and create dialogue to tell a story.

ELA Connections To customize this coding activity for your curriculum:

- Prompt students to imagine a story inspired by a **historical figure, current event, or fictional character they've studied in class**. Is one of the characters an early explorer to the Americas? A scientist studying climate change? A fictional character (or two) from their favorite novel? Encourage them to get creative!

- Tell students to spend a few minutes **organizing their story plot** on paper or in a digital document. Prompts: *Are your characters traveling somewhere exciting? Are they searching the ocean for something? Are they lost?*

- Remind students to use **realistic-sounding dialogue**. Based on their knowledge of the characters' historical background, interests, motivations, and personality, what might the conversation be about? What type of "voice" would each character have? How does their dialogue help move the story line forward?

< CODING ACTIVITY 2 >

ANIMATE A NAME

Try the Animate a Name activity (**g.co/csfirst /scholastic-animate**) on the CS First site. Your students will choose a word that's meaningful to them and program the "sprites," or letters, as well as the backdrop to bring that word to life.

ELA Connections To customize this coding activity for your curriculum:

- Prompt students to choose **a word that represents something they're passionate about** (e.g., dance, animals, art, etc.) or **a vocabulary word**. Explain that they will animate the letters in the word and customize a backdrop that showcases their word. For example, for the word *jubilant*, they could place the letters on a stage, program them to bounce and make a sound, and add extra sprites like a dancer and a trumpet.

- Alternatively, students can **choose the name of a fictional character, historical figure, or a country** that they've studied in class, and use relevant details about that person (motivations, background, interests) or country (cultural traditions, flag colors, foods, etc.) to inform their design.

- If there's time, invite students to **present their words to the class**, explaining their programming choices.

TAKE IT FURTHER

For a deeper dive, try the CS First Storytelling unit at **g.co/csfirst/scholastic-storytelling**. You can spread the multi-activity unit over several weeks or months. How about a coding hour every Friday?

GET MORE RESOURCES FROM CS FIRST
Check out the CS First site at **g.co/csfirst/scholastic** for additional free resources such as reward stickers, solution sheets, activity cards, and more.

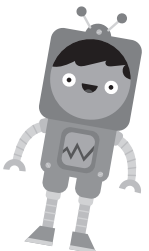# REWARDS PROGRAM

Make copies of these certificates to congratulate your students on a job well done!

✂ -

CODING CHAMPION

THIS CERTIFICATE IS PRESENTED TO

....

for Completing a Coding Activity

....
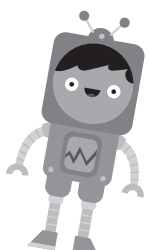
Teacher's Signature   Date

✂ -

CODING CHAMPION

THIS CERTIFICATE IS PRESENTED TO

....

for Completing a Coding Activity

....

Teacher's Signature   Date

BONUS!
ELA IDEAS
FOR TEACHERS

Take part in an Hour of Code this December 3–9, 2018.
Use these bonus ELA activities from Scholastic to enhance
CS First's free video-based coding activity, "An Unusual Discovery."
Students will create an animated story using the coding language Scratch.
Incorporate the tips here to elevate your students' learning even more!

Plot a Narrative

At the start of the coding lesson, students choose two "sprites," or characters, who discuss their "unusual discovery" (a rocket ship, a treasure chest, and others). Have students plot out their story with these prompts:

- Which two characters will you choose? Are they friends? Strangers?
- Why are they standing in front of the unusual object? How did they get there? Are they confused, scared, excited, annoyed?
- What happens next? What plot points will move their story forward?

Write Realistic Dialogue

During the lesson, students create dialogue between two characters. Help them make the conversation sound realistic with these prompts.

- Listen to your friends talk in the lunchroom. What do you notice? In common conversations, people use casual expressions ("Hey!" "Wait, what?" etc.), often don't finish sentences, and speak in short bursts.
- Not everyone sounds the same in real life, so try to create unique voices for each character (e.g., is one funny, and the other more serious?).
- Read your dialogue out loud. Does it sound relaxed and natural? If it feels fake or too formal, go back and revise!

Come Up With a Good Story Title

When students finish their story, they'll create and code a story title. Get them brainstorming a short-and-sweet title with these prompts.

- What kind of title would best describe your story?
- Try using rhymes, puns, or alliteration to add a fun twist to your title.
- Get inspired by movies, songs, or social media memes. Could you change a few words to come up with a clever title for your story?

Find the video lesson at **scholastic.com/computerscience**.