Lesson 1: Code with Anna and Elsa

50 minutes

Overview

In this lesson, learners of all ages get an introductory experience with coding and computer science in a safe, supportive environment. This lesson has been designed for learners in the middle grades, ages 10-13, but can be adapted for younger or older learners using the differentiation suggestions provided. Students should have a basic understanding of simple geometry and drawing angles.

Purpose

This lesson introduces the core CS concepts of coding and programming (using blocks), as well as simple debugging techniques.

Standards

Full Course Alignment

CSTA K-12 Computer Science Standards (2011)

▶ **CPP** - Computing Practice & Programming

Common Core English Language Arts Standards

▶ **L** - Language

▶ **RI** - Reading Informational

Common Core Math Standards

▶ **G** - Geometry

▶ **MD** - Using Probability To Make Decisions

▶ **MP** - Math Practices

▶ **NBT** - Number And Operations In Base Ten

ISTE Standards for Students

▶ **1** - Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.

▶ **4** - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

▶ **6** - Students demonstrate a sound understanding of technology concepts, systems, and operations.

Objectives

Students will be able to:

- Define “coding” and “computer science”
- Identify key computer science vocabulary
- Identify places to go to continue learning computer science and coding
- Make connections between computer science concepts and the real world

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: **Coding with Anna and Elsa**
- 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.
- Review the supplementary lesson plan, **"The Drawing Machine"** to determine whether or not you'd like to lead this lesson in advance of your Hour of Code.

Agenda

One Day Before Your Hour of Code

- Write the words “coding”, “programming” and “debugging” on the board or add them to your word wall if you have one.
- Write the words "Computer Science" in the middle of your board or on piece of paper at the center of a bulletin board. This will serve as your **"mind map"** for the Getting Ready and Assessment activities.
- Have protractors available for students new to measuring angles
- 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.

Vocabulary

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

Teaching Guide

Getting Started (5 minutes)

Setting the Stage

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

> Teaching Tip
>
> If you have time or if your students need a bit more background information, you might consider delivering **"The Drawing Machine"** before your Hour of Code event. This brief lesson introduces students to the idea of computer-assisted drawing, which will set them up for more success with the **Code with Anna and Elsa tutorial**.

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 learners in the middle grades, 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" 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).
- **Debugging** means to check code for mistakes and try to fix errors.

Ask students to name some jobs they have heard of that are related to coding. Students might mention things such as "programmer", "computer scientist", "software developer," or "engineer". Capture student responses on your "Computer Science" board, making a mind map of the information your students share.

Say: "You're right, folks! There are no right or wrong answers here...just about any job these days involves some sort of knowledge of code. While there are many, many careers that require some knowledge of coding, learning to code is something anyone can do. And we're going to do it today. The things we're going to do today may not seem immediately like those, but everything you learn today could lead into making the next Angry Birds or Twitter."

Activity (38 minutes)

Code with Anna and Elsa

Challenge your students to complete the **Code with Anna and Elsa** tutorial.

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

- For younger students, we suggest you break your class into pairs or very small groups (three to four students each) and ask each group to work together to complete the tutorial using **pair programming**. Students in grades K-5 may struggle with the mathematics in the tutorial (it requires a basic understanding of angle measurement). If your students are on the younger side, consider delivering the supplementary lesson plan, **"The Drawing Machine"** to introduce the basics before you facilitate your Hour of Code.
- For older students, 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 Frozen, they can get a similar experience with the **Write Your First Computer Program** tutorial.
- For adult learners, **Code with Anna and Elsa** works extremely well either as an independent challenge or a pair programming activity.

Teaching Tip ▲

Be sure to play through the tutorial yourself, before asking your students to attempt it. That way you'll know what to expect and can make decisions about whether to let students choose their own tutorial, or if you want to assign tutorials based on student needs.

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1 2 3 4 5 6 7 8 9 10 11 12 13 14
15 16 17 18 19 20

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

Wrap Up (5 minutes)

Debrief

Give each student a few sticky notes or notecards. Facilitate a quick **“Whip Around”** activity:

- Pose a prompt that has multiple answers such as “Share back something you really liked about the Hour of Code activity you completed” or “Share some skills you learned today."
- Have students write down as many responses as possible, one idea per sticky note or note card. “Whip” around the room, calling on one student at a time. Have students share one of their responses. When called on, students should not repeat a response; they must add something new.
- After completing the whip around, have students discuss which ideas and themes showed up most in their responses.

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 learning 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.

Assessment (2 minutes)

Ask students to add their “Whip Around” sticky notes or note cards to your "Computer Science" mind map on their way out the door. Try to populate the board with lots of great ideas about what CS is and why it matters.

Extended Learning

Beyond an 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.
- Research some of the careers in coding you identified today. Find resources on planning career research projects on **Sharemylesson.com**.
- **Invite a computer science expert to talk to your class about his or her work**. Don't know any volunteers, reach out to a few on the **volunteer map**.