Coding in an Elementary School

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https://bit.ly/3DEc0Oy
Get Started with Code

In iBook, Apple provides curriculum for teaching coding. Lessons slides on Keynote, unplugged activities, and lists what practice challenges to do on codeSparks or Tynker.
Unplugged Ideas
Unplugged

- Tynker
- codeSpark
- https://csunplugged.org/en/
- https://code.org/curriculum/unplugged
- BootUp Resources
You don’t need devices...

Ozobots

Mouse & Go Robots

Robot Turtle Game
Overview
In coding, a **conditional statement** is a statement that only runs when certain conditions are met and can be phrased as an "If... then..." statement (E.g. - If it's raining, then I will wear my rain jacket.).

Instructions
Have you ever heard of the hand game “Rock, Paper, Scissors?” You can play with two people, with each player making a shape with their hand at the same time (either counting 1,2,3 or saying “rock, paper, scissors”).

A fist represents rock, an open hand represents paper, and a peace sign, or the number 2, represents scissors.

To play this game, conditional statements must be followed in order to crown a winner.

- If rock and paper are played, then paper wins.
- If rock and scissors are played, then rock wins.
- If paper and scissors are played, then scissors wins.
- If both players use the same object, then there is a tie.

**Part 1:** Play 3 rounds and use the conditional statements above to determine the winner for each round. The person who wins 2 out of 3 rounds is the ultimate winner.

**Part 2:** To make the game more fun and unique, make up 3 new actions and conditional statements. Use the worksheet on Page 2 to write down your version of the game. Have fun!
iPad

Get Started with Code available in Books

Apple provides curriculum for teaching coding. Lessons slides on Keynote, unplugged activities, and lists what practice challenges to do on Tynker.
iPad

Free and Paid courses

Students sign in with Google, Clever, or username and password.
Coding Projects

iPad

Students can create projects.

3 free projects from each of the 16 topics

Levels range from beginner to advanced
Website

Free and paid courses available
Website
Lesson slides available

Lessons plans include slides, vocabulary, warm up activity, unplugged activities, and standards.
Iffy Dice Game

You will be competing for Dice Victory!

The Rules:
- Make a Group.
- The oldest player must keep score on a blank piece of paper.
- The youngest player rolls first.
- The player to the right of youngest rolls next.
- Continue taking turns rolling and passing the dice to the right.

IF you roll...  you add 1 point to your score.
IF you roll...  you steal a point from your neighbor to the right.
IF you roll...  you subtract 1 point from your score.
IF you roll...  you have to do 10 jumping jacks.
IF you roll...  give a point to your neighbor on the left.
IF you roll...  you lose a turn.
IF you... have 5 points you’re the winner!
codeSpark
Available on the tablets, mobile devices and computers

GET IT ON Google Play
Download on the App Store
Play on the web at: codespark.com/play
News and Updates

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● Starting in January there will be passwords

● New Adventure Game
  ○ There will be mini lessons
  ○ Teacher slide deck
  ○ Vocabulary
  ○ Integration lesson

● Partnership with code.org for CS Week

● CRESST Partnership
  ○ An exploratory, small-sample pilot study at UCLA showed promising results: Approximately 6 hours of engagement with codeSpark Academy resulted in a nearly 20% improvement in computational thinking skills in third graders. The most notable impacts were on abstraction, algorithmic thinking, generalization, and sequencing.
How to Start Coding

How do you introduce coding to pre-readers?

- Introduction whole group when explaining new coding skill
- Read a story
- Relate it to real life
- Some of the skills can be taught using unplugged activities
- Students can help solve a few levels before working independently

Ashley Cooksey
Code & Early Literacy
Pre-Readers

How can parents encourage their child to code?

• Students can’t read yet, but they can code
• Picture block coding, anyone can do it!
• Over 90% of our students at our school are English Language Learners
• codeSpark Academy is the main program because it uses blocks without words
codeSpark Account

codeSpark Academy is free for use in public schools, libraries and non-profits

codespark.com
Welcome to codeSpark

Here is an example of what you will encounter when you open up the app.

Create your own Avatar.
Basics of Coding

Kapow is here to help!!
Puzzles
Sequencing

A set of instructions that follows one another.
Loops

Loops repeat a sequence of instructions.

Tool Trouble
Advance Sequencing

Using the fewest commands when possible for efficient problem solving.
Events

Triggers certain things to happen.

Puppy Problems
Conditionals

Use "IF" statements to make certain actions happen under certain conditions.
Debugging
Find and fix errors in a program.

Things to think about...

- What is going on with your program?
- Did it do what you wanted it to do?
- Start from the beginning and go step by step to find the bug.
- Now you should know where the bug is, how will you fix it?
Explore
Automation

A sequence of short commands, one after another. We are breaking up a complex task into a set of smaller instructions.
Variables and Inequalities

Learning inequalities through assigning greater than or less than values to variables.
Stacks and Queues

Explore the mannerisms and parameters of data structure stacks by adding or removing data one at a time from the top.
Sweet Sorter

Assign true or false values of an expression through boolean logic.
Create
Game Maker
Code your own game using codeSpark Academy

Students can create own game.

Students can use a tutorial.

Students can publish their game.
Using word-free coding your students can become gamers.  
• Students can use tutorials to start their game.  
• Students can create their own games.

Games can be shared with friends that have an account or to the world.
Creative Stories

Code your own stories using codeSpark Academy

Using word-free coding your students can become storytellers.

- Stories can be personalized with recording and text.
- You can also input own images.

All stories will be saved to the device at this time. They must use the same device to finish their stories.
Badges

The new addition last year!

- Students can self monitor
- Quick glance on progress
CSTA Standards

CSTA Standards are covered within the first five chapters and the studio.
codeSpark Resources

codespark.com

- Free access to full codeSpark Academy App
- Curriculum
- Unplugged Activities
- Lesson Plans
- Solution Guides
- Parent Resources
- Professional Development
“codeSpark Ignite Professional Development”
It is an online professional development course designed to help primary educators to teach young students the basics of Computer Science and the foundations of computational thinking.
Spaceship Algorithm

Unplugged
Scratch
Scratch for Educators

Scratch is free, but a teacher account is required to create classes and studios.

Educator Guides show you how to prepare and run Scratch classes and workshops.

Download and print Coding Cards for step-by-step instructions for a variety of projects.
Tips for Creating Student Accounts

- Start with numbers
- Use initials and symbols
- Do not use real names
Scratch Lessons
Created by BootUp

41 lessons

Student Portal
Teacher Portal
Knock, Knock Joke

Quick intro lesson to Scratch
Student Resources

Online tutorials and are available

Students learn how to use the Scratch blocks step-by-step.
Ideas tab includes Activity Guides, PDF cards to download, and Starter Projects. Students follow steps to create a project.
Starter Projects

Students can Remix projects to add to existing projects.

Starter projects include:

- Animation
- Games
- Interactive Art
- Music and Dance
- Stories
- Video Sensing
Remix Other’s Projects

Students can find any project on Scratch and remix it.

Explore different projects others have created. Students can read code to see how the project works.
Scratch Jr.
Creating Student Accounts

- There is no log in
- Students will have to name their projects if sharing devices
Scratch Jr. Lessons

Activities

Each of these activities gives you a quick way to learn how to do new things with Scratch Jr. They are listed here in order of simplest to hardest, but feel free to play around in any order you’d like!

For more information and a brief introduction to Scratch Jr. see the Resources page.

1. Drive Across the City

Pick a background and a character, and use a motion block to make a car drive across the city... Read more

2. Run a Race

Use the speed block to speed up or slow down a character... Read more
Overview of Scratch Jr.

Lesson Plan Overview
- Preview of the lesson
- Objective and Standards
- Practice and Concepts
- ScratchJr Blocks
- Vocabulary
- Preparation Time
- Work Time
- Assessment
Glitch Says Game

Overview

A command tells someone what to do, just like when parents give commands to their kids such as: Clean your room; Brush your teeth; and Eat your vegetables.

In coding, a command is a single instruction and multiple commands can be put together to tell a computer what to do.

Instructions

Have you ever played “Simon Says?” The game “Glitch Says” is very similar. You will need at least 3 people to play this game.

1. One person will be the Glitch calling out the commands. Everyone else will be Foos.
2. The Foos will need to follow all of the commands the Glitch says, but only if Glitch says the statement “Glitch says...” in front of the command. For example: “Glitch says touch your head!” - The Foos would touch their head.
3. If Glitch doesn’t say “Glitch says...” in front of the command and a Foo does the command, then they are out.
4. The last standing Foo wins and gets to be the Glitch for the next game.

To make the game more challenging, the Glitch could say the commands quickly or do the actions without saying “Glitch says...” to try and get a Foo out. Have fun!
Family Involvement
Parent Classes

It is important for parents to understand the language of the FUTURE!

My students will encounter many challenges in life. We need to create well-rounded, educated students that are equipped for the 21st century.
Parent Recruitment

Parent Coding Classes
Lesson Plans

coderspark.com/play/coderspark-app

• Administration Support
• Flyers
• Parent Newsletter
• Scheduled every Wednesday 8:00-9:00
• Take new parents for first few months
• Introduce them to what their children are expected to learn in the future
CS Week Coding Virtually

Participate in National Family Code Night with thousands of students from around the country through [CSiselementary.org](http://CSiselementary.org).

Virtual: Students that log on at given time and will be engrossed in a collaborative coding environment led by experts from *CS is Elementary*. Students will navigate between two browser tabs during the event - [YouTube](http://YouTube) and [code.org](http://code.org).

The event is approximately one hour.

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CSEdWeek

Events for You & Your School

- Administration signs up
- Flyers
- Parent Newsletter
Students are exposed to different types of coding

**Primary Grades**
PixelBots, Scratch Jr, Go, Blocky and codeSpark Academy

**Upper Grades**
Tynker, Scratch, Lego WeDo 2, code.org, Blockly, and codeSpark Academy

**Sixth Grade**
Code Academy, Lego WeDo 2, Swift Playground, code.org, Blockly, and codeSpark Academy
Resources

code.org: https://code.org/ (website)

codeSpark Academy: https://codespark.com/ (app and website for teachers)

Dash and Dot: https://www.makewonder.com/ (multiple apps and website for teachers)

Ozobots: https://ozobot.com/ (some apps, website)

Scratch: https://scratch.mit.edu/ (website)

Scratch Jr.: https://www.scratchjr.org/ (app and website for teachers)

Swift Playground: https://www.apple.com/swift/playgrounds/ (app)

Tynker: https://www.tynker.com/ (app and website)
More App Resources...

Kodable: Grades K-5 [https://www.kodable.com/](https://www.kodable.com/)


Box Island: Grades K-2 [https://boxisland.io/](https://boxisland.io/)

PBS Scratch Jr.: Grades K-2 [https://pbskids.org/learn/scratchjr/](https://pbskids.org/learn/scratchjr/)


More Web-Browser Resources...

Code Monkey: https://www.playcodemonkey.com/

CodeCombat: https://codecombat.com/

Flexbox Defense: http://www.flexboxdefense.com/
Drawing Algorithm

Overview

In coding, an algorithm are the steps to a task. Algorithms are made up of sequenced commands. A sequence is the order that commands are performed by a computer.

Instructions

This activity will show kids how following an algorithm to draw DogFoo allows them to be more accurate, minimizes mistakes, and can save time. A writing utensil and paper is needed for this activity.

Part 1:

1. Tell your child that you want them to draw DogFoo as best as they can. You can show them the picture of DogFoo, but for a greater challenge, just show it to them for a short amount of time.

2. Once completed, have them reflect on that process: How long did it take them? Was it difficult? Was it easy? How did they feel?
Students use block coding to program robots.

Dash & Dot

Wonder Workshop

https://www.makewonder.com/

Kinder: sequencing

First Grade: sequencing and loops

Second Grade: sequencing, loops and events

Students are able to put all their coding skills to create an end of the year project.

When I receive new students or students do not understand a concept, I always go back to codeSpark Academy to reinforce coding concepts.