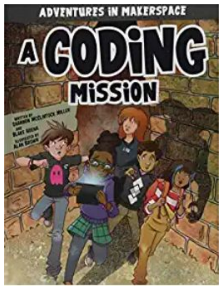
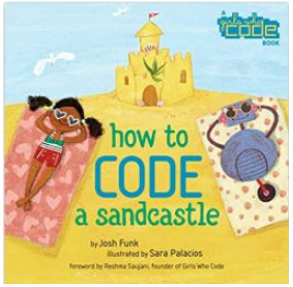
CTLC

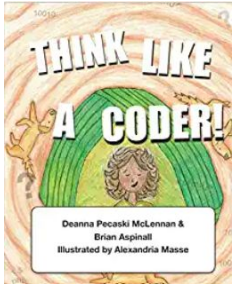
July 23, 2021

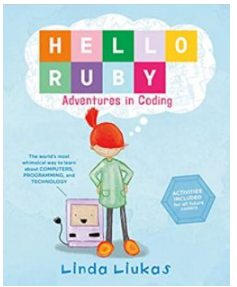
Using Picture Books to Support Computational Thinking

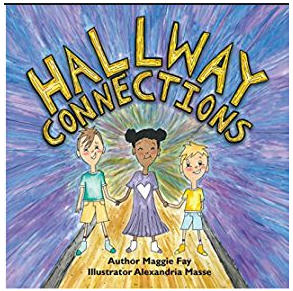
Presented by Sarah Veenhuyzen











What a Year!?!

Addressing

Flexibility, Adaptability, and Change

in the Computational Thinking Program in Spring Branch ISD

Thinking like a computer scientist!

COMPUTATIONAL THINKING

the thought processes involved in using algorithms to solve problems

Thinking like a computer scientist!

The Four Pillars of Computational Thinking

DECOMPOSITION	ALGORITHMS	PATTERN RECOGNITION	ABSTRACTION
DEFINITION Breaking a problem into manageable parts	**DEFINITION** A set of steps you can follow to complete a task	**DEFINITION** Finding similarities among things	**DEFINITION** Removing details or differences to make a solution work for multiple problems
KEY Part by Part	**KEY** A list of steps	**KEY** Match Patterns	**KEY** Pull out differences and make it simple

Thinking like a computer scientist!

Other Helpful Terms

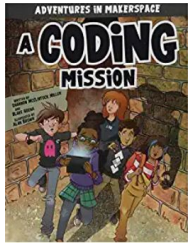
SEQUENCE	BUG	DEBUG	PROGRAM
A particular order of steps or events	An error in a program	Find and fix errors (bugs) in a program	A set of instructions written in a language (code) that a computer understands

Getting Started!

Books and Materials

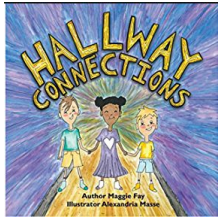
A Coding Mission
By Blake Hoena & Shannon McClintock Miller

Supplies
- Legos
- Printable
- Egg Cartons
- Plastic Eggs
- Red Construction paper
- Action figure/ game piece



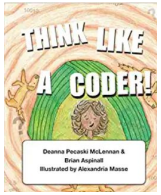
Hallway Connections
By Maggie Fay & Alexandra Masse

Supplies
- Printable



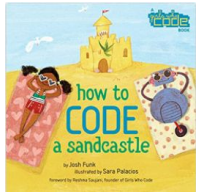
Think Like a Coder
By Brian Aspinall & Deanna Pecaski McLennan

Supplies
- Deck of cards
- Toy mouse
- Toy treats
- Printable



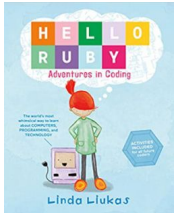
How to Code a Sandcastle
By Josh Funk

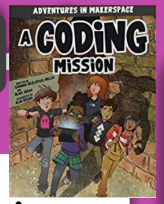
Supplies
- Printable
- Plastic Cups



Hello Ruby
By Linda Liukas

Supplies
- Printables





A Coding Mission
By Shannon McClintock Miller
& Blake Hoena

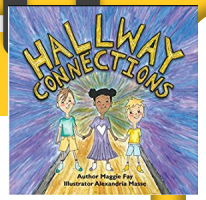
Debugging

With a little practice everyone can get good at debugging, or correcting your mistakes.
Find out the 4 simple steps it takes to squash a bug and some tips to debug even faster.

Everyone gets bugs!!!

Option 1	Option 2
Coding a Lego Maze This activity will teach students to think from a point of reference different from their own. Students at every age will be challenged to write a program (as short as possible) to solve a specific maze. 	Egg Carton Unplugged This activity will teach students to design an algorithm to capture all the egg prizes and avoid the hot lava rocks. You can make it more challenging by adding more obstacles in your maze! 

EXTENSION:
MAZE DEBUGGING

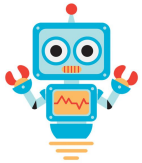


Hallway Connections
By Maggie Fay

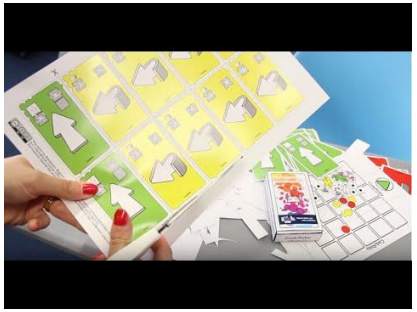
We all communicate differently!

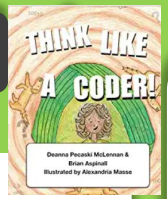
REAL-LIFE ALGORITHMS

Communication and Coding



Communication is key in coding, as it is elsewhere in school and life. The 2 unplugged activities (tasks that take place away from a computer) below will demonstrate to students why communication is such an important skill.

PreK - 4th Grade	5th - 8th Grade
Rosie's RunTime (you need to download the game pieces)	Cody and Roby (you need to download the game pieces)
	



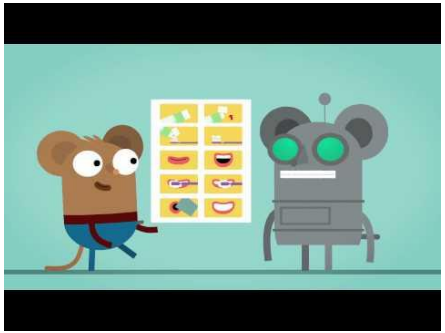
Think Like a Coder
By Deanna Pecaski McLennan & Brian Aspinall

Break a problem down into easy to follow small steps!

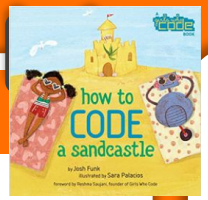
[Real-Life Algorithms: Paper Airplanes]

Algorithms

At the root of all computer science is something called an algorithm. The word "algorithm" may sound like something complicated, but really it's just a list of instructions that someone can follow to achieve a result.



Grades PreK - 4th	Grades 5th - 8th
Feed the Mouse This game teaches students about algorithms by designing a path for a mouse. 	Happy Maps This activity teaches students how to think ahead in order to plan a short route from a start location to a finish location. 



How to Code a Sandcastle
By Josh Funk

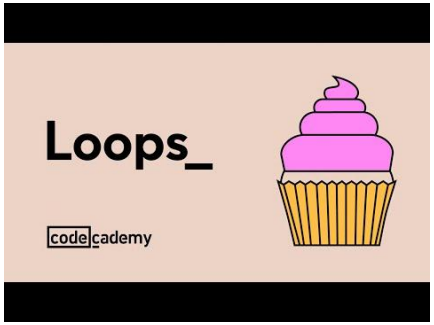
Be Persistent…

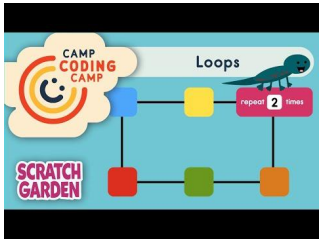
Something wonderful is around the corner!

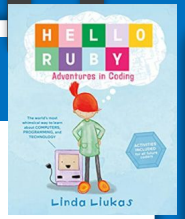
BUILDING A FOUNDATION

Let's Get Loopy

Loops are a fundamental concept in computer science. Here is an explanation on how they work, with the help of our favorite dessert.



Grades PreK - Kindergarten	Grades 1st - 4th	Grades 5th - 8th
Secret Handshake In this lesson, students develop their own secret handshake sequences using 3 or more moves. 	Cup Song Activity Can you recreate the sequence in the video below? Can you create your own song? You just need a cup and your imagination! 	Getting Loopy Act out loops with the Iteration Dance! (you need to download the dance moves.) 



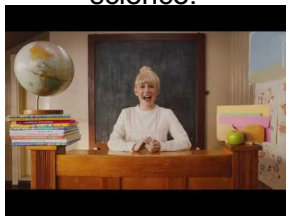
Hello Ruby
By Linda Liukas

Computational thinking helps make light work of difficult problems

MONSTER CATALOG

Computational Thinking

When children develop computational thinking skills they are able to articulate a problem and think logically. Watch this video to see how the author of *Hello Ruby* shares the topic of computational thinking in her book.

Activities For Students of All Ages	For Teachers
Hello Ruby Play Learn about computers, programming and technology through these free, fun activities. 	Love Letters for Computers This page was made for the curious and creative teacher, to help them learn more about computer science. 

Questions?

Let me know how it goes!
Feel free to reach out with any questions!

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