



An Introduction to Coding in the Junior Grades

Plugged Activities (with use of Technology)

This resource was developed for ETFO for educators with little to no experience in Coding. The activities shared below have been selected to help teachers begin their coding journey with activities that are fun for students and covers many of the coding expectations in the Ontario Math Curriculum!



Activity #1: Intro to Coding with Lightbot

Website: <https://lightbot.com/hour-of-code.html> (also available on iPad/Android devices)

Overview of Activity: Students will learn how to program a robot by using icons. It is a very popular and fun coding activity that introduces students to many coding concepts such as loops.

Suggestions:

- Brainstorm “What is coding?” as a class. (no right or wrong answers)
- Introduce this activity with little to no instructions, except this is a new challenge. Give students 10-20 minutes to work on this activity. During this time, the teacher should walk around the room, and document student language students are using when they struggle, such as “I Can’t Do This!” After the 10-20 minutes, bring the students back in and share the words you documented (without sharing names) with your students and discuss what it means to have a growth mindset and how it relates to coding. Co-create a set of classroom expectations with your

students.

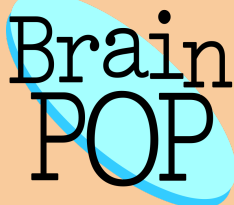
- Feel free to send back students to work on the activity with a clear set of expectations!

Self-Reflection Questions for Students:

- 1) How would you explain, in words, what the turn and jump instructions do (precisely)?
- 2) How did you come up with a solution to a new level (All in one go? A step at a time?)
- 3) If Lightbot did not do what you wanted, how did you find the mistake and fix it?

Additional Resources:

- If you want to learn more about Lightbot:
<https://lightbot.com/hoclearn.html>
- Solution/Answer Key: <https://lightbot.com/LightbotSolns.pdf>



Activity #2: Blockly Maze (from Brain Pop)

Website: <https://www.brainpop.com/games/blocklymaze/>

Brief Overview: Students will learn about block programming as they will drag blocks to instruct a character to move properly through a maze to reach a specified target.

Suggestions:

- Key term to be discussed here is an algorithm (a list of steps you can follow to finish a task).
- You can find a lesson plan for this activity here:
<https://educators.brainpop.com/lesson-plan/computer-coding-lesson-plan-blockly-maze-game/>
- There are only 10 mazes to complete for this activity.
 - Grade 4's: Level 1-5 (can do more if they would like)
 - Grade 5-6: Level 1-10

Self-Reflection Questions: (from <https://educators.brainpop.com/teaching-tip/blockly-essential-questions/>)

- What are the fundamentals of computer programming?
- How do you create a program?

- How are algorithms used in coding?
- How can you use computer programming to complete a task?
- How is computer programming useful in real life?
- How might you use computer programming in your future career?

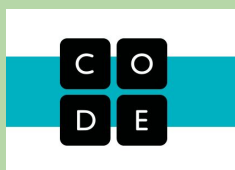
Activity #3: Loops

Website: <https://studio.code.org/s/course2/stage/6/puzzle/1>

Brief Overview: Students in this activity will learn about loops.

Recommendations:

- Watch this short video that introduces repeat loops:
<https://youtu.be/mgooqyWMTxk>
- Only complete puzzles 1-12



BONUS: Dance Party (code.org)

Website: <https://studio.code.org/s/dance-2019/stage/1/puzzle/1>

Brief Overview: Students will learn and be able to create dance animations with code. You can have students develop an algorithm/program that incorporates various elements of dance (body, action, space, time energy)

Teacher Guide: <https://curriculum.code.org/hoc/plugged/8/>

Questions for Self-Reflection and/or Group Discussions:

- What is something you enjoyed about today's activity?
- What is the connection between creativity and computer science?
- Explain how you incorporated the elements of dance in your program



Using Scratch Platform:

What is Scratch?

Scratch is a popular block-based coding program that makes it easy to create your own interactive stories, games, and animations.

How do I get

Getting Started Guide:

<p>started?</p>	<p>https://cdn.scratch.mit.edu/scratchr2/static/_d1850169cd46695f2c1b79ecf98872e0_/pdfs/help/Getting-Started-Guide-Scratch2.pdf</p> <p>Video Tutorials: https://scratch.mit.edu/help/videos/</p> <p>Scratch Cards: https://cdn.scratch.mit.edu/scratchr2/static/_d1850169cd46695f2c1b79ecf98872e0_/pdfs/help/Scratch2Cards.pdf</p>
<p>Scratch Activity:</p>	<p style="text-align: center;"><u>Draw a Square</u></p> <p>Website: https://www.digitalcircus.org.nz/drawing-shapes</p> <p>Brief Overview: In this activity, students will learn to create a program that can draw a square. Suggestions for extensions also provided in the link above.</p> <p>Reminder: Students and teachers need to create a scratch account first (https://scratch.mit.edu/) and create a new project to begin.</p>
<p>Scratch Activity:</p>	<p style="text-align: center;"><u>Animate your name</u></p> <p>Website: https://scratch.mit.edu/projects/236215503/editor and https://csfirst.withgoogle.com/c/cs-first/en/animate-a-name/materials.html</p> <p>Brief Overview: In this activity, students will use the Scratch program to make a name come to life by adding animations, sounds and music! This activity encourages students to be creative and showcase their personality.</p> <p>Reminder: Students and teachers need to create a scratch account first (https://scratch.mit.edu/) and create a new project to begin.</p> <p>Additional Resource:</p> <ul style="list-style-type: none"> ● Tutorials (for teachers and students): https://csfirst.withgoogle.com/c/cs-first/en/animate-a-name/animate-a-name/animate-a-name.html ● Lesson Plan: https://docs.google.com/document/d/1NF73os0-jTUcQ

	BkGkWSeVtnc8qYvqp8MCCgRQfw18Vg/edit?usp=sharing
Debugging:	<p>All coders need to know how to read and fix problems in their code. Brief video explaining debugging: https://youtu.be/OgaACt4owHc</p> <p>Here is an activity to practice debugging programs: Website: https://scratch.mit.edu/studios/475483/</p> <p>Click on each challenge and read the directions. Click the green flag to watch the program. Can you see the problem?</p> <p>Debugging Guide for Students (from code.org): <i>Recommended to help students with problem solving</i> https://docs.google.com/document/d/1z2FgBWwUq6vxwWbnbiQC0EaEKxwgAqBdtTzZVi98xHA/edit</p> <p>Debugging Recipe for Students (from code.org): https://docs.google.com/document/d/1mvczixGJKW6449WNmmc-r3RL3_2PU0yViiQSsRcTTNY/edit</p> <p>Another resource to practice: https://studio.code.org/s/course1/stage/5/puzzle/1</p>
Other Resources	
CS First	<p>CS first is a free coding program that makes coding easy to teach. https://csfirst.withgoogle.com/en/home</p>
Code.org (Hour of Code)	<p>Choose from a wide variety of coding activities! https://hourofcode.com/ca/learn</p>
Compute It:	<p>Compute It is a flash based game that challenges students to over 50 levels of coding puzzles. Through this game, students will learn about loops, conditionals, and functions. http://compute-it.toxicode.fr/</p>

