CANADA LEARNING CODE

micro: music

By: Jen
Duration: 3 projects (3+ hours)

LEVEL	SUBJECTS	PROVINCES / TERRITORIES	TOOL
Age 7+	Music, Arts & Technology	Across Canada	micro:bit

Overview

This lesson contains three projects. In project one, students will learn to code their own music for micro:bit using the MakeCode editor. In the second project, students will collaborate (with guided instruction) to create their own piano. In the third project, students will design their own micro:bit controller using alligator clips, a headphone jack, a banana and an orange.

Prep Work

- The instructor should have some knowledge of micro:bit
- micro:bit (one per student)
- Computers or a device capable of pairing to micro:bit
- Students should have had some previous experiences with coding (Scratch or Blockly)
- Materials for paper piano: paper, tinfoil, 6 crocodile clips, glue and a headset.
- Materials for fruit keyboard: micro:bit, battery holder and 2 AAA batteries, Banana, Orange, headphone jack, and 4 Crocodile clips

Key Coding Concepts

- Algorithms
- Events
- Variables

Terminology

Algorithm: a step-by-step set of operations to be performed to help solve a problem

Events: When one thing causes another thing to happen

Variable - A placeholder for a piece of information that can change

Curricular Connections

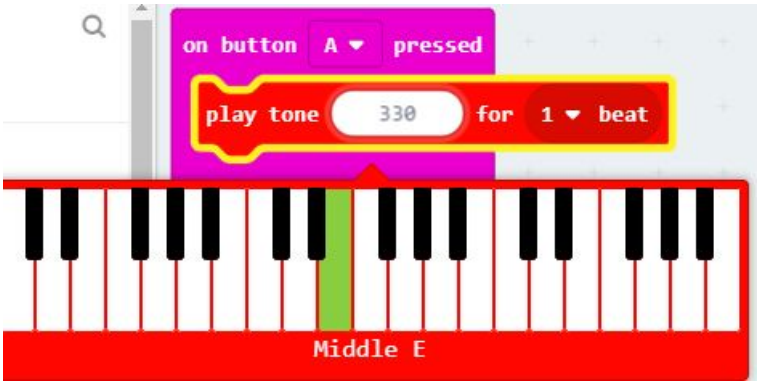
Music - note reading and song writing

- Materials for extension activity: creating a guitar (fabric, duct tape, cardboard, glitter, tinfoil, elastic bands, buttons etc.)
- Review: http://bit.ly/connect-microbit-to-headphones

Lesson

Project #1: Create a Song

Go to http://bit.ly/make-a-new-project and start a new project. Students can program their own code to create a song. Challenge students to use loops and other coding blocks.
They can use the simulator to play their song or download it and attach their micro:bit to speakers to share with their friends.



Connecting micro:bit to headphones PDF doc:
http://bit.ly/connect-micro-bit-to-headphones

This is a video (by Call of Dennig) to show students a sample of a project and also includes a demo how to attach headphones:
http://bit.ly/microbit-sample-project

Project #2: Make a Piano (Collaboration with Guided Instruction)
This is a complex project but could be completed with

Art - design and innovation

Technology Outcomes - computation thinking

References

MakeCode Reference Guide: https://makecode.microbit.org/reference

micro:bit Educators Guide https://www.slideshare.net/Microsofteduk/bbc-microbit-guide-from-hodder-education

The Official BBC micro:bit User Guide (2018) by Garteth Halfacree

micro:bit Tutorial Series Part 1: Getting Started https://www.youtube.com/watch?v=ZIW_6rxYNBg

micro:bit by BBC - Creative Classroom Tips for Educators https://www.youtube.com/watch?v=pR_AapxVudM

Connecting micro:bit to headphones PDF doc:

micro.bit MakeCode Editor: https://makecode.microbit.org/#

Demo Video (by Call of Dennig) https://www.youtube.com/watch?v=eGNZXILCjyo

Piano Paper Project Instructions:

small groups and adult guidance. Materials should be prepped ahead of time. Below are detailed instructions, an exemplar video, and code that could be used.

Piano Paper Project Instructions:
http://bit.ly/microbit-paper-piano-instructions

An exemplar of a project:
http://bit.ly/microbit-paper-piano-example

Piano Code
http://bit.ly/microbit-piano-code
*note: click edit to remix code.

Project #3: Fruit Keyboard
Students will design their own micro:bit controller using alligator clips, a headphone jack, a banana and an orange
(you may want to tell students that they will be creating a circuit)

This lesson is from micro:bit MakeCode
http://bit.ly/fruit-keyboard-lesson
*note: the coding script can be downloaded or students can code their own music.

Here are some music tutorials from MakeCode micro.bit:
https://makecode.microbit.org/reference/music

https://makecode.microbit.org/reference/music/begin-melody

An exemplar of a project:
https://www.youtube.com/watch?time_continue=1&v=6a_rykLlN3k

Piano Code
https://makecode.microbit.org/v0/03107-69090-41198-50535

Banana Keyboard Lesson:
MakeCode micro:bit
https://makecode.microbit.org/projects/banana-keyboard/make

Music Tutorials from MakeCode micro.bit:
https://makecode.microbit.org/reference/music

https://makecode.microbit.org/reference/music/begin-melody

An exemplar of a project:
https://www.youtube.com/watch?time_continue=1&v=6a_rykLlN3k

micro:bit MakeCode: Design an Intstrument
https://makecode.microbit.org/courses/csintro/arrays/project

Assessment

Formatively Assess:

Is the student able to independently follow coding instructions?

Does the student have a growth mindset and is able to troubleshoot bugs that may arise?

Is the student able to take risks and create some of their own code?

Is the student able to collaborate with others?

Extensions

MakeCode micro:bit Musical Instrument Project: This is a project in which students are challenged to create a musical instrument that uses arrays to store sequences of notes. The array of notes can be played when an input occurs, such as one of the buttons being pressed, or if one or more of the pins is activated.

http://bit.ly/project-musical-instrument

Playing Star Wars on your micro:bit (learn to program your micro:bit & review music notes)

Create an animation to go with your music!