CANADA LEARNING CODE

micro:fit Step Counter

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Duration: 3 Part Lesson (approximately 3 hours)

LEVEL	SUBJECTS	PROVINCES / TERRITORIES	TOOL
Age 7+	Physical Education and Technology	Across Canada	Unplugged, micro:bit

Overview

This is a beginner micro:bit project. This lesson is a three part lesson. The first part focuses on the coding concept variables and includes an unplugged lesson from Code.Org. In the second part, students will program the micro:bit to keep track of their steps and then in the third part, students will create their own fitness step counter strap.

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 step counter strap (fabric, duct tape, cardboard, elastic bands, etc.)

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

Physical Education:
Health: Participation in physical

Lesson

PART 1

If this is students first experience with micro:bit view introduction video: micro:bit Tutorial Series Part 1: Getting Started
*note: watch first 3 minutes only
https://www.youtube.com/watch?v=ZIW_6rxYNBg

Complete Code.Org Variables - In Envelopes Unplugged Lesson (50minutes)

Preview video: Code.Org Variables - In Envelopes
https://studio.code.org/s/coursef-2018/stage/14/puzzle/1

Review explanation of variables (from Code.Org) and complete unplugged lesson plan (approximately 50 minutes):

"Variables are used as placeholders for values such as numbers or words. Variables allow for a lot of freedom in programming. Instead of having to type out a phrase many times or remember an obscure number, computer scientists can use variables to reference them." https://curriculum.code.org/csf-18/coursef/14/

See Teacher video for additional support:
https://www.youtube.com/watch?v=MKmV_awzv8Q&feature=youtu.be

PART 2:

Program a Prototype Step Counter (30 minutes)
Watch video about the importance of tracking steps:
https://tv.theiet.org/?videoid=7300

Complete lesson by micro:bit

The code starts by making a variable called "steps" and

activity can improve fitness—muscular strength, flexibility, muscular endurance, body composition and cardiovascular endurance—and reduce the risk factors related to heart disease, including obesity and high blood pressure.

Active Lifestyle: Physical activity, over time, is beneficial to personal well-being.
Goal Setting: Physical education provides opportunities for students to practise goal setting as they participate.

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

setting it to 0. Every time the micro:bit is shaken it adds to the step count and shows it!

https://microbit.org/en/2018-02-13-iet-lessons-11/

PART 3:
Students will design a step counter strap (either for your ankle or wrist). Provide a variety of materials to design the strap.

The design must:

- Have some way of attaching to clothing or have a strap that will securely hold the micro:bit on the wrist or ankle.
- Be comfortable to wear and lightweight
- Be pleasing to the eye (people will want to wear it!)

Assessment

Code.Org Variable Assessment Worksheet
https://code.org/curriculum/course4/4/Assessment4-Variables.pdf

Design Rubric Assessment (See below):

Extensions

To further student's understanding of variables:
Code.Org Variables with Artist
https://studio.code.org/s/coursef-2018/stage/15/puzzle/1

Code.Org Variables - In Envelopes Video Explanation
https://studio.code.org/s/coursef-2018/stage/14/puzzle/1

Code.Org Variables - In Envelopes Unplugged Activity
https://curriculum.code.org/csf-18/coursef/14/

Code.Org Teacher video for additional support on Variables:
https://www.youtube.com/watch?v=MKmV_awzv8Q&feature=youtu.be

Watch video about the importance of tracking steps:
https://tv.theiet.org/?videoid=7300

micro:bit Step Counter Activity
https://microbit.org/en/2018-02-13-iet-lessons-11/

Code.Org Variable Assessment Worksheet
https://code.org/curriculum/course4/4/Assessment4-Variables.pdf

Extension Activity: Code.Org Variables with Artist
https://studio.code.org/s/coursef-2018/stage/15/puzzle/1

Developing a micro:fit: Student Self- Assessment Rubric

Name(s):

Date:

	Outcomes Not Met (needed support)	Met Outcomes (acceptable)	Exceeded Outcomes	Comments:
Able to independently create program and download to micro:bit				
micro:bit is securely supported				
micro:fit's design is lightweight and comfortable				
micro:fit's design is appealing				
Able to troubleshoot (debug) any issues				

Developing a micro:fit: Assessment Rubric (Instructor)

Name(s):
Date:

	Outcomes Not Met (needed support)	Met Outcomes (acceptable)	Exceeded Outcomes	Comments:
Able to independently create program and download to micro:bit				
micro:bit is securely supported				
micro:fit's design is lightweight and comfortable				
micro:fit's design is appealing				
Able to troubleshoot (debug) any issues				