

This resource was developed with funding from the Government of Canada CanCode program. We are required to collect participant data; it helps the government administrators understand the breadth of access and the impact of these kinds of programs.

If you are using this resource with learners and have received it from a source other than by participating in a Science World online program please fill out our participant survey <http://tinyurl.com/techuprequest>

Micro:bit

Learning Kit (Gr. 6-9)



All classes are running differently right now. Our team is available to collaborate with you to adapt this for your classroom needs. Please do not hesitate to email us at techup@scienceworld.ca for any support you need with this kit.

Summary:

This kit contains resources for both synchronous and asynchronous lessons. There is a teacher guide to walk you through leading the challenges over a series of 4 sessions of approximately 30-45 minutes as well as a set of learner challenge handouts for learners to work through on their own as assigned according to your own timeline and discretion.

In these activities, learners will learn how to create block code and test it on the micro:bit simulator. Once comfortable with the interface, learners will complete a series of challenges leading up to a final challenge of their choice between coding a rock paper scissors game, a magic 8 ball, or a sorting hat. These challenges will introduce learners to displays, variables, random numbers, and conditional statements. *All skills and code learned in this activity can also be used with a physical micro:bit.*

Kit Overview:

- Curriculum links
- Activity timeline suggestions
- Teacher lesson guide (containing links to solution walkthroughs)
- Learner challenge handouts
- Associated hex files

Required Technology and Materials:

For teachers:

- Computer with internet connection and ability to send learners a document
- Micro:bit is **optional**

- **For online synchronous activity only:** ability to share your screen and speak to the learners
 - This can be done with Teams, Zoom, etc.
 - <https://jitsi.org/jitsi-meet/> is a free online video conferencing tool that requires no accounts to use

For learners:

- Computer with internet connection (tablet is okay for self-paced; may not work with micro:bit classroom during synchronous activity)
- Micro:bit is **optional**

Note: Upon request, the Tech-Up facilitator can help you find which platform works best for you.

Timeline:

Note, if doing synchronous lessons, allow yourself 20 minutes prior to sessions for setting up and familiarizing yourself with micro:bit classroom. Expect to spend about 15 minutes during the first session to get learners connected, logged on, and familiar working within micro:bit classroom.

Intro/join session	20 minutes
Challenge 1 – displays and button presses	10 minutes
Challenge 2 – create a counter that increases and decreases on button presses	30 minutes
Challenge 3 – displaying different images with conditional statements	30-45 minutes
Final – rock, paper, scissors game or magic 8 ball or sorting hat	30-45 minutes

Curriculum links:

[ADST](#)

Ideating

- Choose an idea to pursue

Prototyping

- Outline a general plan, identifying tools and materials
- Record iterations of prototyping

Testing

- Test the product
- Gather peer feedback and inspiration
- Make changes and test again, repeating until satisfied with the product

Sharing

- Demonstrate their product and describe their process
- Critically reflect on their design thinking and processes, and their ability to work effectively both as individuals and collaboratively in a group, including their ability to share and maintain a co-operative work space
- Identify new design issues

Applied Skills

- Use materials, tools, and technologies in a safe manner, and with an awareness of the safety of others, in both physical and digital environments
- Identify the skills required for a task and develop those skills as needed

Applied Technologies

- Choose, adapt, and if necessary learn about appropriate tools and technologies to use for tasks

Math

Reasoning and Analyzing

- Use reasoning and logic to explore, analyze, and apply mathematical ideas
- Use tools or technology to explore and create patterns and relationships and test conjectures

Understanding and Solving

- Apply multiple strategies to solve problems in both abstract and contextualized situations
- Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving

Connecting and Reflecting

- Reflect on mathematical thinking
- Connect mathematical concepts to each other and to other areas and personal interests
- Use mathematical arguments to support personal choices

Core Competencies

- [Communicating](#)
 - Answering the reflection questions to explain their thinking
 - Communicating their ideas and explaining their code with their family, teacher, and peers
- [Creative thinking](#)
 - Adapting their code to perform the same task in a different way
 - Extending their code to go beyond the main challenge – seeing opportunities to build on what they've created and how it could be used to facilitate different goals
- [Critical and reflective thinking](#)
 - Debugging their code
 - Analyzing their task and determining how to accomplish it using the code blocks they're provided
- [Personal awareness and responsibility](#)
 - Persevering through difficult coding tasks and working towards finding a solution
 - If assigned as a self-paced lesson, managing your time appropriately and creating a plan for finishing the assignment
 - Developing and utilizing strategies to manage frustrating situations when coding
 - Seeking feedback