MICRO:BITS

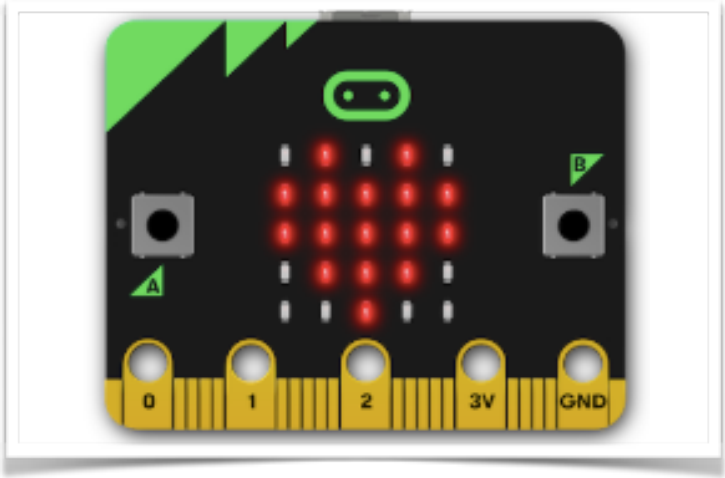
February's Maker Challenge: Micro:Bits, Coding & The Curriculum

What is a Micro:Bit?

A micro:bit is a very small computer that can be programmed to execute a range of actions – from making LEDs appear in a pattern on screen, to transmitting and receiving radio signals to becoming a micro-controller for all sorts of projects (guitars, cars, watches – the list is endless!).

How do you Program it?

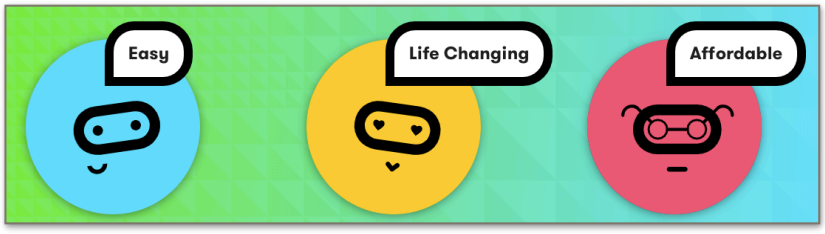
Programming a Micro:Bit can happen in either the online block coding environment or Python. In this sense, depending on the user's comfort level and experience, one could say the Micro:Bit is both 'low-floor' and 'high-ceiling' and with the range of projects, has "wide-walls" (Resnick et al., 2009).



Micro:Bits: Why Use It?

The Micro:Bit is a fantastic tool because it is relatively inexpensive to purchase, it has a host of resources associated with it online and it is a fun and easy tool in which to learn coding and/or to go deeper with computer programming (i.e. a student can code with the visually appealing block coding platform or with the language-based Python).

With the Micro:Bit it is also possible to create a variety of STEAM or subject-integrated activities. So, if students aren't initially 'wowed' by coding there's the potential to be engaged through other avenues (for example, a student might be really interested in tangible fabrication and would like to make an LED-infused bracelet, control a car or a make a usable guitar).



Where Might You Integrate it in the Classroom?

The Micro:Bits website has a range of projects, ideas, tutorials and community resources on which educators and students can draw: https://microbit.org/ideas/

Some math-forward resources:

- Rock, paper, scissors
- Salute! https://makecode.microbit.org/projects/salute

Some science-forward resources:

- Soil Moisture: https://makecode.microbit.org/projects/soil-moisture
- Infection! https://makecode.microbit.org/projects/infection

Some arts-forward resources:

- Make a Guitar! https://makecode.microbit.org/projects/guitar
- Duct-tape Wallet: https://makecode.microbit.org/projects/wallet

Some technology and/or engineering forward resources:

- Banana Keyboard: https://makecode.microbit.org/projects/banana-keyboard
- Plant Watering: https://makecode.microbit.org/projects/plant-watering

There are multiple entry points to the tool (making it learner-centered, differentiated and personalized) and students aren't learning concepts in a theoretical vacuum as they can make concrete, real-world arteafacts.

In addition to overt curriculum connections (see side panel resources) the Micro:Bit can also help develop 21st C and/or transversal skills such as computational thinking, creativity, innovation, collaboration and problem-solving.

The website offers a Micro:Bit simulator so that students can test their code before pushing it through to their physical Micro:Bit. This helps build students' problem-solving and troubleshooting skills and it is also part of the engineering design process (test and revise before releasing the final product). For our February challenge, the STEAM3D lab is challenging you to do the following:

1. Become familiar with the Micro:Bit website and some of the various resources it has to offer. Come back to the group and share which one was of most interest to you, why and how you could see integrating the resource into classroom practice (i.e. building out a larger lesson).

2. Go through the "Rock, Paper, Scissors" tutorial and have a game against the Micro:Bit you've just programmed! Be ready to share your programming experience with the group (i.e. lessons learned, insights): https://makecode.microbit.org/projects/rock-paper-scissors

Reference:

Resnick, M., Maloney, J., Monroy-Hernandez, A., Rusk, N., Eastmond, E., Brennan, K., Millner, A., Rosenbaum, E., Silver, J., Silverman, B., and Kafai, Y. 2009. Scratch Programming for all. Comm. ACM 52, 11, 60-67.