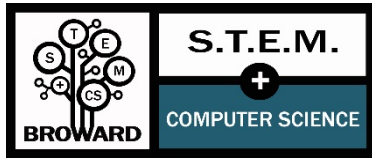Broward County Public Schools
STEM+Computer Science, Applied Learning Dept.
Presenters: Erik Leitner, Rebecca Malones, Sheryl Arriola
(Instructional Facilitators)
Email: browardstem@browardschools.com

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Science and Micro:bit   https://microbit.org/

What is it? Micro:bit is a pocket-sized computer that has 25 red LED lights that can flash messages and be used to create games, messages, and sensor displays. There are two programmable buttons that can be used to control for example, games or pause and skip songs on a playlist.
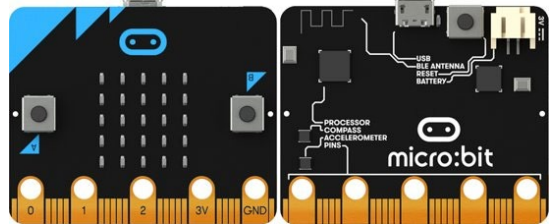
In this session, you will determine if it's time to water your plants by using a Micro:bit Soil Moisture Sensor! You can code your moisture sensor to read or measure the moisture content in both dry and wet soil.

The soil itself has some electrical resistance which depends on the amount of water and nutrients in it. It acts like a variable resistor in an electronic circuit. The combination of water and soil nutrients makes the soil have some conductivity. So, the more water there is, combined with the nutrients, the lower the resistance and higher the reading (voltage).

Art, Social Studies and Music with Makey Makey   https://makeymakey.com/
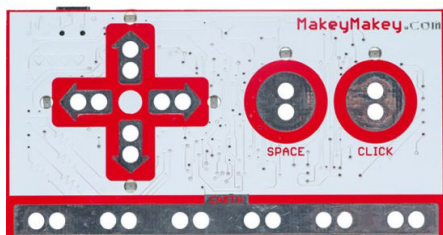
What is it? Makey Makey is a little microcontroller that emulates your computer keyboard, sending out keystrokes to the computer when a circuit is completed on one of its inputs. It is an invention kit for everyone, is a simple circuit board that lets you reprogram the world by connecting everyday objects to a computer.

How does it work? Makey Makey Classic works through opening and closing circuits, just like any other button. Instead of the circuit being closed underneath your keyboard, the circuit is closed through the conductive objects you connect with alligator clips like your hand or your lunch or some tinfoil.

Music: Fruit piano, bongo, cereal box guitar
Art/Social Studies: Interactive poster, cereal box guitar

- Guitar Makey Makey remix (RMBroward) - https://scratch.mit.edu/projects/258713679/

- Interactive Water Cycle remixed for Makey Makey (RMBroward) - https://scratch.mit.edu/projects/258071827/
- Dance Dance Revolution - Scratch V1.1 remix - https://scratch.mit.edu/projects/14044356/
- Bongos with Apples - https://apps.makeymakey.com/bongos/
- Piano Bananas - https://apps.makeymakey.com/piano/
- Large Makey Makey - https://labz.makeymakey.com/cwists/preview/1294x

NOTE: To encourage empathy, have students design their controllers based on another student's specification – take into account any limitations.

## Merge Cubes (science, social studies, math)   https://mergevr.com/cube

AR/VR is changing the way kids learn, create and play, and MERGE is leading the way. The award-winning products help kids get ahead by making STEAM learning fun and allowing them to experience the world in an entirely new way. All apps and experiences are pre-screened to ensure they're kid safe for parental piece of mind.
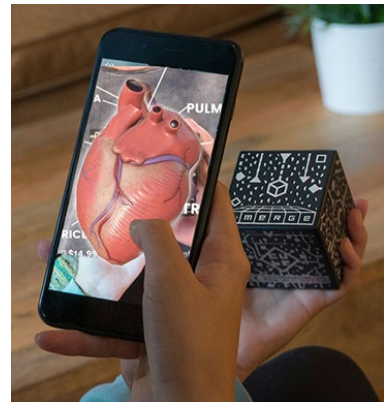
MERGE enables active learning by enabling students to learn and create in entirely new ways while giving teachers simple AR/VR tools that increase student engagement, intellectual curiosity and classroom achievement.

Using the Micro:bit to code PE activities
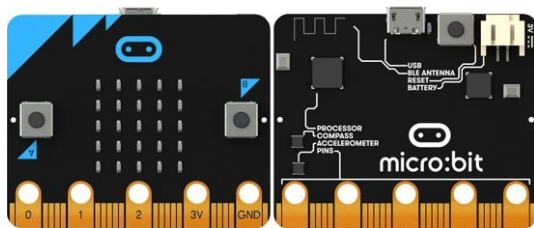
What is it? Micro:bit is a pocket-sized computer that has 25 red LED lights that can flash messages and be used to create games, messages, and sensor displays. There are two programmable buttons that can be used to control for example, games or pause and skip songs on a playlist.

It also has an accelerometer so it can detect motion and knows when you're on the move. The built-in compass knows which direction you're heading in and it can use a low energy Bluetooth connection to interact with other devices and the Internet. Using these inputs, outputs and sensors, let's put a Computer Science spin on an old classic...

Red Light Green Light
This is the classic "Red Light, Green Light" game where one person is a virtual stoplight and gives commands to the other players to either stop or go.