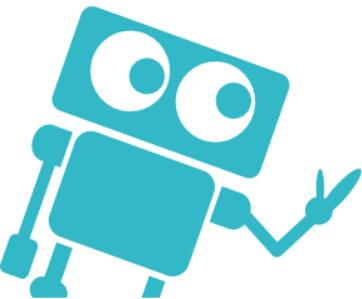


**T**

Tinker

**5**

Points



## **micro:bit**

Explore a :bit

Jump into the world of microcontrollers and programming by learning the basics of the BBC's micro:bit and Microsoft's Makecode.com site. Try to make a blinking heart display, a scrolling badge, or an emoji display.

Mackin**Maker**

# T

Tinker

# 5

Points

## Materials:

- micro:bit with USB cable
  - Internet connected computer
- 

## Quick Start:

1. Collect your materials.
2. On a computer navigate to [www.makecode.org](http://www.makecode.org).
3. Select the micro:bit link.
4. Plug in your micro:bit to USB and to the computer.
5. Try the flashing heart tutorial.
6. Keep watching tutorials and exploring the micro:bit as time allows.

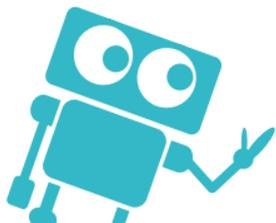
## Hints and Tips:

- Makecode is the easiest way to start but micro:bits can be programmed by other online editors too. Try MIT's Scratch program or even code in Python.
  - Have a Windows computer? You can download the offline micro:bit app if you want to program while offline.
- 

## Extended Challenges

**Computer Science:** Micro:bits are a perfect way to explore the world of physical programming. Explore variables, logic, arrays or functions.

**Computer Science:** The Makecode builder has a toggle button that allows you to look at the programming syntax. Extend this project by trying to type code instead of just using the blocks.

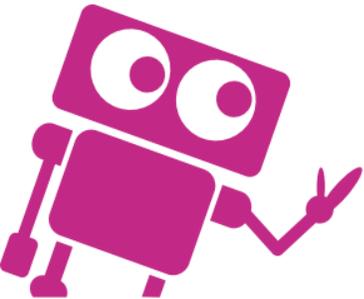


S

Skill-Up

10

Points



## micro:bit

It's A Dice Roll

Code a dice program with your micro:bit that randomly displays dice faces when the bit is shaken.

MackinMaker

S  
Skill-Up

10  
Points

## Materials:

- micro:bit with USB cable
- Internet connected computer

## Quick Start:

1. Collect your materials.
2. On a computer navigate to [www.makecode.org](http://www.makecode.org).
3. Select the micro:bit link.
4. Plug in your micro:bit to USB and to the computer.
5. Work your way through the digital dice tutorial.

## Hints and Tips:

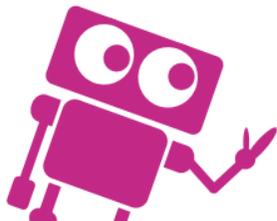
- Need some extra tips? Check out the micro:bit Code Cards at: <https://makecode.microbit.org/coding-cards>.
- Did you know that micro:bits will still

run your program when unplugged from a computer? Simply plug in the battery pack into the white JST connector and the micro:bit will run the last program that was uploaded.

## Extended Challenges

**Computer Science:** Rewrite your program to make your micro:bit work with another in a multi-player dice game. Look for the “Multi Dice” project under “Radio Games” to get started.

**Math:** Put your algebraic understanding into practice with random numbers as you add to your understanding of inequalities and variables.

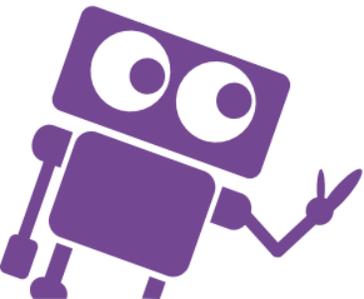


**D**

Design

**15**

Points



## micro:bit

### A Way With Words

Program the micro:bit to display scrolling words or a set of words and symbols, and then explore novel ways to trigger these programs as well.

MackinMaker

**D**

Skill-Up

**15**

Points

## Materials:

- micro:bit with USB cable
- Internet connected computer

---

## Quick Start:

1. Collect your materials.
2. On a computer navigate to [www.makecode.org](http://www.makecode.org).
3. Select the micro:bit link.
4. Plug in your micro:bit to USB and to the computer.
5. Explore the scrolling words and name badge tutorials.
6. Program your micro:bit to scroll different words when different inputs happen (button presses, tilt, shake, etc.).
7. Try to integrate scrolling words into a class or subject assignment.

## Hints and Tips:

- If you use micro:bit with MITs Scratch program, you can extend the features of your micro:bit to do things like move a Sprite (a digital character) on the screen or even trigger sounds and voices to add to your word-themed prompt.

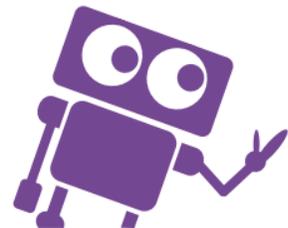
<https://scratch.mit.edu/microbit>

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## Extended Challenges

**English/Language Arts:** Elevate your creative writing by making a random story component generator. Just program your micro:bit to display words for various elements of a story (example: setting, characters, conflict/problem, nouns and verbs) –one word for each available input: shake, tilt right, tilt left, or button a or b pressed.

**Social Studies quizzier:** Program your bit to scroll social studies vocabulary when tilted, buttons are pushed, or the bit is shaken.





G

Global



19

Points

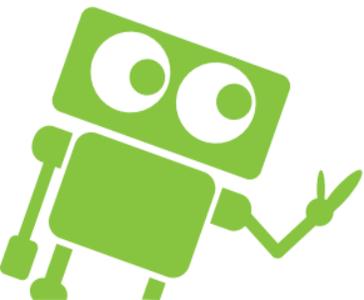
## micro:bit

Get Moving a :bit

Obesity is on the rise around the globe. What can you create with a micro:bit to help get people moving more?



MackinMaker



## Materials:

- micro:bit with USB cable
  - Internet connected computer
- 

## Quick Start:

1. Brainstorm ideas to get people moving more using the micro:bit.
  2. Sketch some ideas.
    - On a computer navigate to <https://makecode.microbit.org/>.
  3. Plug in your micro:bit to USB and to the computer.
  4. Explore projects in the “Fashion” category.
  5. Create your micro:bit moving device.
- 

## Hints and Tips:

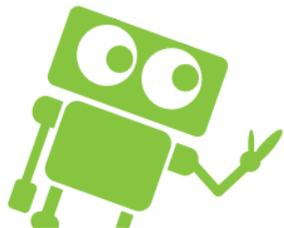
- Want to use your micro:bit with other devices? Check out the comprehensive quick start guide from the micro:bit foundation to learn all sorts of great tips. <https://microbit.org/get-started/first-steps/set-up/>.

- Need some more ideas? Take a look at the [Technologywillsaveus.com](https://technologywillsaveus.com) website for a lot of great micro:bit ideas.
- 

## Extended Challenges

**Art:** Turn the functional moving device into a full-fledged wearable fitness-tracking device by designing a beautiful way to attach it to a user's body. Maybe a duct tape wristband, ankle, or fashionable pendant.

**Physical Education:** Test the wearable micro:bit devices that were created in the fitness challenge. Trade devices and see how they work for different exercises. Can you count push-ups, jumping jacks, and track steps or sense a sudden change in direction to count laps?

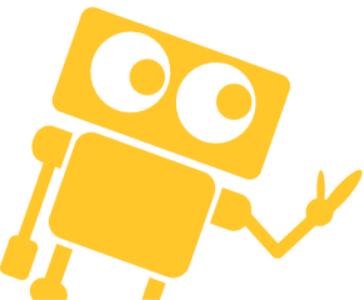


I

Innovator

24

Points



## micro:bit Sensor For Good

Create a unique micro:bit sensor that could help you at school, home, or in your community. Can you see when your plant needs to be watered? Or when the door to your room is opened?

MackinMaker



## Materials:

- micro:bit with USB cable
  - Internet connected computer
- 

## Quick Start:

1. On a computer navigate to <https://makecode.microbit.org/>.
  2. Explore the science and tools categories to see what types of sensors you could make.
  3. Brainstorm problems that a micro:bit sensor could help you solve.
  4. Sketch your best solutions
  5. Plug in your micro:bit to USB and to the computer and code your bit.
  6. Build any enclosures needed for your final device.
- 

## Hints and Tips:

- Dig further in micro:bit sensor capabilities by looking at the “Tools” section of the micro:bit Makecode website.

- You can also program the micro:bit in Python. Check out this handy resource to get started fast: <https://microbit.org/guide/python/>.
- 

## Extended Challenges

**Computer Science:** Go past block programming by learning to program your micro:bit in Python (see link above) or learn Java Script by toggling in the Makecode editor.

**Science:** micro:bit can be used as an inexpensive sensor device for your science studies. Try to program them to sense acceleration and velocity, soil moisture, and/or sunlight. Make your own timing gate or drop sensor, or even graph the amount of shaking for your next earthquake simulation project.

