

# The micro:bit journey

[Extended Abstract]

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## ABSTRACT

The micro:bit rocks!

## 1. INTRODUCTION

The micro:bit is a small programmable and embeddable computer designed, developed and deployed by the BBC and partners (including ARM, Microsoft, and Lancaster University) to approximately 800,000 UK middle school students in 2015-2016. Part of the BBC's Make it Digital Campaign, the BBC described the micro:bit as its "most ambitious education initiative in 30 years, with an ambition to inspire digital creativity and develop a new generation of tech pioneers." [?]

Figure ?? shows a picture of the front and back of the micro:bit, which measures 4x5 centimeters. Like the Arduino Uno, the micro:bit is a single-board microcontroller that can be programmed via a host computer (usually a laptop or desktop) and then embedded in projects where it runs on battery power. In contrast to the Uno, which has no built-in sensors, the micro:bit board hosts a variety of sensors (temperature, accelerometer, compass, light level), a 5x5 LED matrix, two user-defined buttons, as well as Bluetooth Low Energy (BLE) communications.

The design of the micro:bit hardware was driven by the first two objectives of the micro:bit project:

- to provide a simple creative experience for physical computing and embeddable/wearable projects, yet
- to supply a device that is sufficiently capable to grow with the user's experience;

On the hardware side, the micro:bit's built-in sensors, buttons and LED display allow many projects to be completed with just the micro:bit. The holes on micro:bit's edge connector allows additional external sensors and actuators to be

connected via crocodile clips. As with Arduino, an ecosystem of micro:bit shields that the micro:bit can plug into expand its capabilities greatly. The micro:bit's BLE capabilities introduces networking to the picture, and enables streaming of data and command/control operations among the micro:bit, smartphones, laptops, as well as other micro:bits.

The design of the micro:bit firmware and coding tools also were oriented towards a simple starting experience with room for progression. In particular, the coding objectives of the project were:

- to give students an exciting, engaging introduction to coding;
- to stimulate curiosity about how computing technologies can be utilized to solve problems that students identify.

What happened:

- implementation and rollout took half a year longer than expected (surprise, with devices landing in classrooms in February of 2016, more than halfway through the 2015-2016 school year in UK);
- first full school year was 2016-2017, during which micro:bit Education Foundation got started;
- now have two full school years complete with experience in more countries

## 2. ACKNOWLEDGMENTS

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