

Micro:Bit: Data Collection and Visualization

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Questions???

Enter questions in the chat window!

Q&A time at the end too

Brief Background

Me

- Work
 - Where: Washington University ***in St. Louis (Central U.S.)***
 - What: Teach computer science & computer engineering
 - What 2: Summer camps & community outreach

Brief Background

Partners: Institute for School Partnership (ISP)

- What: Partner Univ. and regional schools
 - Design / deploy K-12 science curriculum
 - 9,000+ kits & 220+ schools / year
 - Teacher professional development
 - 1,200+ hours / year

Brief Background

Partners: Michigan Tech

- Michigan Technological University
 - What: Student course projects
 - Examples: ...

ISP Needs

- Temperature-based experiments
- Measure materials
- Collect & analyze data

Micro:bit Challenges

- Micro:bit's built in temp sensor
 - Inaccurate ($\pm 4^{\circ}\text{C}$);
 - Chip temperature, not ambient
- Immersion in water

Sensor Module & Blocks

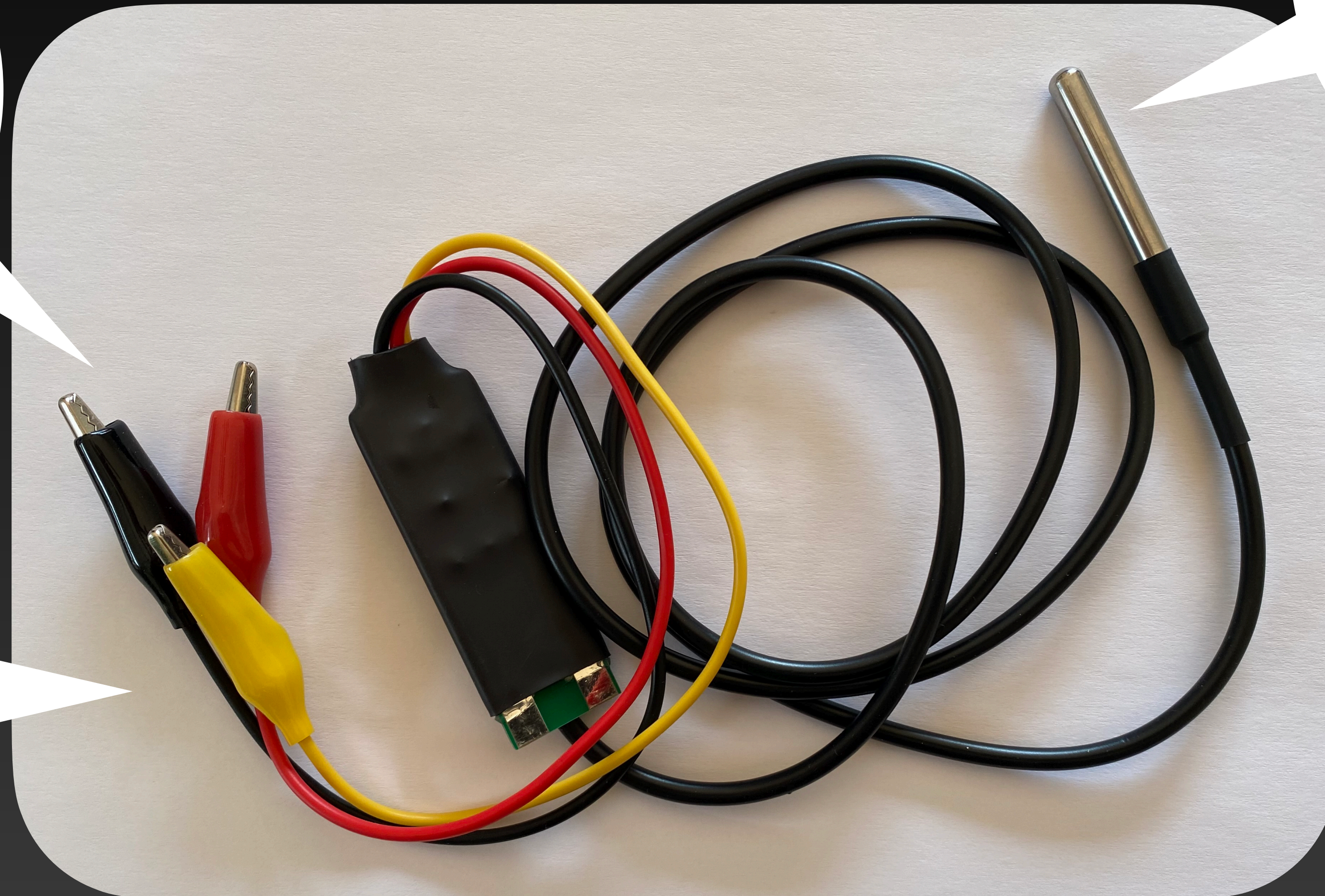
Easy to connect

Total cost of
parts

~\$5.10 (U.S.) each
for ~100

DS18B20

$\pm 0.5\text{ }^{\circ}\text{C}$
Sealed



<https://vimeo.com/445128371>

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[illegible]

mySci Do: Instructions

<http://bit.ly/MicroBitTempGraph>

MakeCode

Data Collection & Graphing

- Focus: Micro:bit is connected to computer with cable
- How:
 1. Data format & output
<https://makecode.microbit.org/device/data-analysis/writing>
 2. Data viewer in console
<https://makecode.microbit.org/device/data-analysis/viewing>

Demo

Michigan Tech Student Project

Better graphing for science experiments

- Goals
 - Better ability to visualize
 - Clearer start/stop and “events”
 - Support for multiple, simultaneous micro:bits

Demo

<https://2020-sd.github.io/microbit/>

Resources

- Current Graphing Site work:
 - <https://2020-sd.github.io/microbit/>
 - Input / testing welcome! Help make it better!
 - Contact me (Slack or bsiever@gmail.com)
- Sensor Extension (DS18B20)
 - Alpha version: <https://github.com/bsiever/microbit-dstemp-alpha>
 - Official extension soon (?)

Resources

- Previous Graphing Site
 - Source: <https://github.com/bsiever/microbit-usb-grapher>
 - Live: <https://bsiever.github.io/microbit-usb-grapher/>
- Graphing Library (for JavaScript / pages)
 - Source: <https://github.com/bsiever/microbit-webusb>
 - Live: <https://bsiever.github.io/microbit-webusb/>

Resources

Wirelessly Stream Data

<https://www.youtube.com/watch?v=eJiddQwKPck&t=108s>

