



Teacher at Sea Alumni Association Professional Development

Introduction to Sensors with Micro:bits (online course)

The Introduction to Sensors with Micro:bits course teaches the basics of using sensors to collect data. This introductory course is geared towards teachers in any subject area who want to learn how to use sensors with their students to collect and analyze data. No electronics or coding experience is required. **This course will take approximately 15 hours to complete** (3 hours of required online meetings plus approximately 12 hours of asynchronous learning) and will be conducted through an online learning management system and will feature both synchronous and asynchronous activities.

Course Objectives:

- Learn how to use various [Micro:bit](#) sensors, including: accelerometer, light and temperature sensors, and compass
- Learn basic [block coding](#)
- Build a basic temperature sensor
- Collect temperature data using a Micro:bit and temperature sensor
- Generate a graph of data from a spreadsheet
- Create a classroom activity using Micro:bit and one or more sensors to collect data

Course Dates:

- One-hour, required online meetings on **Nov. 1st, Nov. 15th, Nov. 29th at 4:30 PM PT / 7:30 PM ET**
- Optional meeting on **Nov. 8th at 4:30 PM PT / 7:30 PM ET**

Course Overview and Statement of Work

Student Responsibilities:

- Active participation in both synchronous and asynchronous activities of the virtual course. This will include participation in discussions, virtual meetings, and completion of required activities. **Note:** if you are unable to attend a live virtual meeting, you will need to watch the recording and complete a reflection.
- A commitment to using sensors and data in your curriculum.

Deliverables for Successful Course Completion:

1. Signed Statement of Work
2. Required assignments (see course overview below)
3. Attendance and participation in required online meetings
4. Create a lesson or activity using the sensors to use with your students

Costs Associated with Course to be Paid for by the Alumni Association:

- The Micro:bit Kit + Sensor supplies is valued at \$40
- The course and materials are free of charge to alumni

Materials You Provide:

- Computer with USB port
- Reliable Internet
- Materials to test sensors (i.e., a source of light/dark, heat/cold)
- Access to a spreadsheet program, such as Microsoft Excel, Google Sheets, or Open Office
- Camera to take photos for assignments (a phone camera will work fine)

I _____ understand that if I fail to participate in the course activities, I may be required to return the course materials to the Alumni Association. I also understand that I must complete all required activities to receive a certificate of course completion.

Signature

Date



Micro:bits: Introduction to Sensors

Course Overview

I. Course Introduction Due by: Oct. 31 st	II. Learn the Micro:bit Nov. 1 st at 4:30pm PT / 7:30pm ET	III. Explore the Micro:bit (optional) Nov. 8 th at 4:30pm PT / 7:30pm ET
<p>Preview the online course, explore your Micro:bit, and complete the statement of work assignment.</p> <ul style="list-style-type: none"> • Activity: Review the course materials • Homework: Sign and upload the Statement of Work 	<p>We will meet one another in our first online meeting and explore the built-in sensors on the Micro:bit together through several activities.</p> <ul style="list-style-type: none"> • Activity: Online virtual meeting to explore the Micro:bit • Homework: Reflection and continue exploring sensors 	<p>In this lesson, you will explore some of the practical applications for teaching with the Micro:bit.</p> <ul style="list-style-type: none"> • Activity: Continue exploring Micro:bit sensors (with optional online meeting to do together) • Activity: Micro:bits tutorial videos/reading • Homework: Discussion question
IV. Connect a Temperature Sensor Nov. 15 th at 4:30pm PT / 7:30pm ET	V. Analyze Micro:bit Data Nov. 29 th at 4:30pm PT / 7:30pm ET	VI. Final Assignment Due by: Dec. 10 th
<p>You will learn how to connect a waterproof temperature sensor to the Micro:bit. We will build this together, test it out, and discuss practical applications.</p> <ul style="list-style-type: none"> • Activity: Create a temperature sensor in online meeting • Homework: Design and execute an experiment testing out the temperature sensor 	<p>You will learn how to take the data from your Micro:bit and create a graph. We will also brainstorm classroom applications together.</p> <ul style="list-style-type: none"> • Activity: How to extract data from Micro:bit • Homework: Create a graph from the data you collected using the temperature sensor 	<p>Create an activity/lesson/unit to do with your students using your Micro:bit.</p>
Resources:		
<ul style="list-style-type: none"> • What is block coding? • How does block coding compare to text-based coding? • What is a Micro:bit? • What is a breadboard? • Micro:bit sensor projects 		