

## Components List

Please purchase your materials as soon as possible so you can bring them to class on September 19<sup>th</sup>. That is when we start using the microcontroller.

The course assistants will be available to help you in this process.

**Procurement is an important part** of the design and manufacturing process. Some components have a manufacturing lead time in weeks or even months and require ordering in advance. Some components can be substituted—with tradeoffs—for alternatives that are cheaper or more easily available. Some components *cannot* be substituted due to design requirements, e.g., compatibility with certain software. Due to standardization, the same component can also be sourced from different suppliers, which can offer different prices and times to deliver. In addition, there are discounts when buying in bulk volumes. With that in mind, please go over the list of materials below. You may choose to purchase the following components for individual use (convenient for practicing at home) or for a group of three (more cost-efficient but requires sharing).

	Component Name	Total Quantity	Cost Per Unit	Official Link
Required	BS2 Board of Education kit	1	\$99	<a href="https://www.parallax.com/product/board-of-education-full-kit-usb/">https://www.parallax.com/product/board-of-education-full-kit-usb/</a> (Out of stock)
Required	What's a Microcontroller? Parts Kit	1	\$27.99	<a href="https://www.parallax.com/product/whats-a-microcontroller-parts-kit/">https://www.parallax.com/product/whats-a-microcontroller-parts-kit/</a>
Required	PING))) Ultrasonic Distance Sensor <sup>1</sup>	1	\$34.95	<a href="https://www.parallax.com/product/ping-ultrasonic-distance-sensor/">https://www.parallax.com/product/ping-ultrasonic-distance-sensor/</a>
Required	Parallax 2 x 16 Serial LCD with Piezospeaker <sup>2</sup>	1	\$34.95	<a href="https://www.parallax.com/product/parallax-2-x-16-serial-lcd-with-piezo-speaker-backlit/">https://www.parallax.com/product/parallax-2-x-16-serial-lcd-with-piezo-speaker-backlit/</a>
Optional	555 Timer	1	\$0.48	<a href="https://www.digikey.com/en/products/detail/texas-instruments/NE555P/277057">https://www.digikey.com/en/products/detail/texas-instruments/NE555P/277057</a>
Optional	LM358 Dual Op-Amp	1	\$0.99	<a href="https://www.parallax.com/product/lm358-dual-op-amp/">https://www.parallax.com/product/lm358-dual-op-amp/</a>
Optional	10K Ohm Potentiometer	2	\$3.98	<a href="https://www.parallax.com/product/10-k-3-pin-3-4-turn-potentiometer/">https://www.parallax.com/product/10-k-3-pin-3-4-turn-potentiometer/</a>

<sup>1</sup>The HC-SR04 version of the Ultrasonic Distance Sensor is much cheaper, but it has 4 pins rather than 3 pins to connect to. Choosing this will make your programming slightly more difficult. Choose wisely.

<sup>2</sup>Highly recommend ordering this exact component.