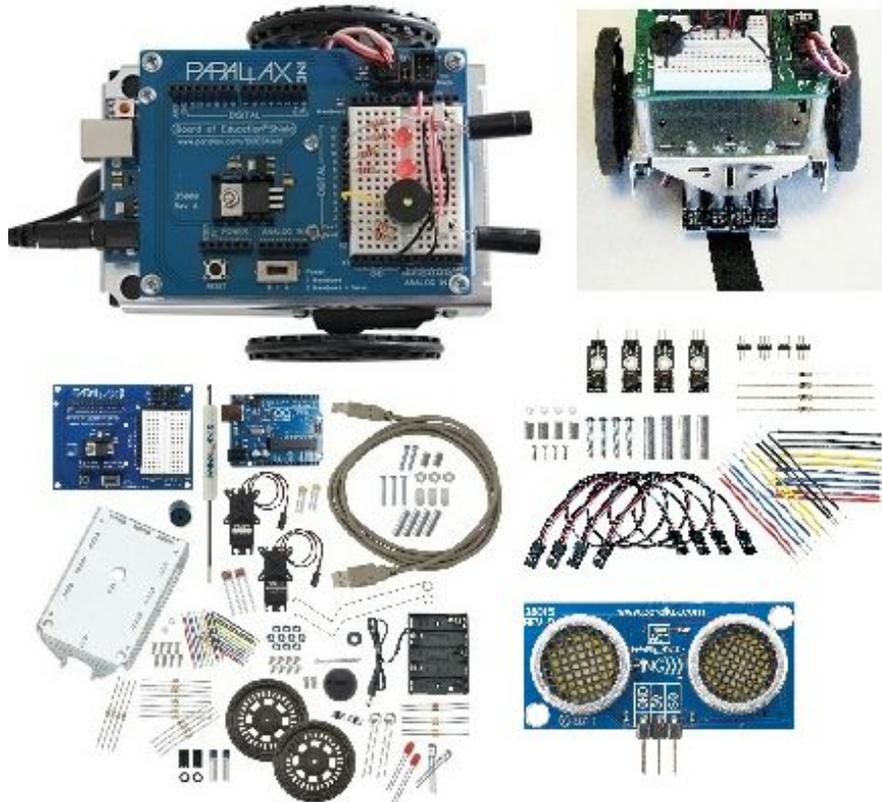




Seattle Robotics Society

SRS Workshop Robot Class Overview



Things you need to bring to class:

1. 5 each AA batteries.
2. Wire snips.
3. Small needle nose pliers.
4. The screwdriver comes with the kit.
5. A laptop computer with USB port.

Included with each kit is a flash drive with all the needed documentation and the Arduino IDE zip file. However, if you would like to get a head start you can find the Arduino IDE download at <https://www.arduino.cc/en/Main/Software>. The files for the class can be found at <http://learn.parallax.com/ShieldRobot>, and for all the sensors included with kit at <http://www.parallax.com>. The kit costs \$125.00 (no tax; \$3 contribution to SRS) and is available only through the SRS at that low price.

There are 8 chapters of lessons in the Parallax “Robotics with the Board of Education Shield for Arduino” pdf.

1. Your Shield-Bots Brain.

This chapter shows how to set-up the Arduino programming environment and how to use it, then takes you through some basic programming in Arduino C.

2. Shield, Lights and Servo Motors.

This chapter covers how to use the Board of Education Shield with the Arduino microcontroller. It illustrates different methods of programming using LED's as output, understanding PWM and how to program and calibrate servos.

3. Assemble and Test Your BOE Shield-Bot.

This covers assembling your robot, using a piezo speaker and very extensive information on testing and calibrating servos.

4. BOE Shield-Bot Navigation.

In this chapter we learn how to make the robot move and how to adjust the programming to make the robot move precisely. It covers using functions and arrays and even includes how to play a tune on the speaker.

5. Tactile Navigation with Whiskers.

This chapter covers using tactile sensors to navigate around the robot's environment and goes into how to put decision making capabilities in your robot. There is a very interesting section on how to escape corners and dead ends.

6. Light Sensitive Navigation with Phototransistors.

This chapter shows how to make a photovore and read voltages from a sensor. Using different resistors it also teaches some of the basics of Ohm's Law then goes on to using the phototransistors to navigate. It also shows how to use the serial monitor to make a graphic display.

7. Navigating with Infrared Lights.

This chapter covers using Infrared sensors to navigate and covers how these work and how to calibrate them for different responses such as edge detection and locating IR interference within an area.

8. Robot Control with Distance Detection.

This set of lessons shows how to determine distance using IR sensors. It also includes a lesson on PID control. One of the projects is to make a robot that can follow another robot around.

An added set of lessons which we will do will teach how to use and program an Ultrasonic sensor called a Ping))) which allows the robot to sense obstacles before it reaches them. The documentation for this sensor is on the flash drive or can be downloaded from <http://learn.parallax.com/KickStart/28015> or <https://www.parallax.com/product/28015>.

The class structure will be very informal and adjustable to student needs or other factors and hopefully a lot of fun! The class schedule will be posted on the SRS website at seattlerobotics.org and on the Robothon Facebook page at [facebook.com/Robothon](https://www.facebook.com/Robothon). If you have questions or even suggestions please email me at carolhaz391@gmail.com.

Online Software Dev Tools (requires Internet access)

Website (browser-based, no SW download req'd): <http://www.codebender.cc>

Chromebook/Chrome OS application: [Chromeduino](#)