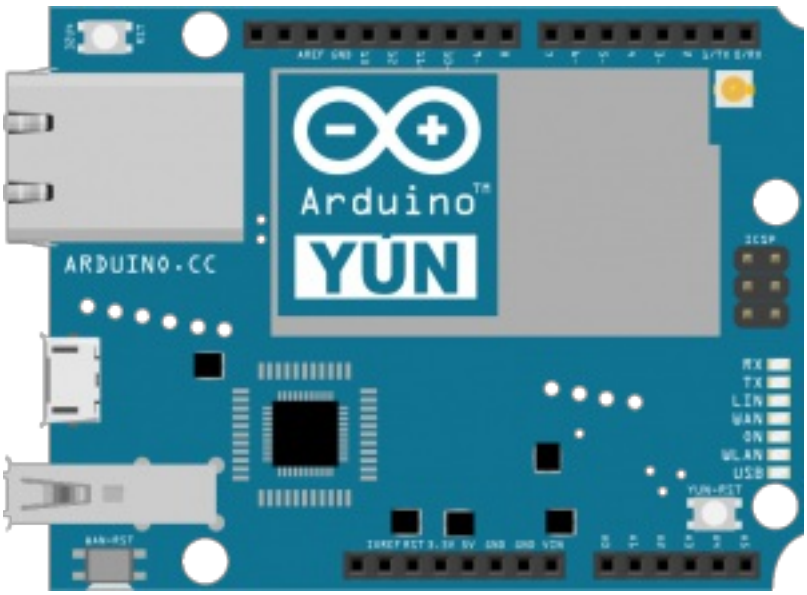
Arduino Experimenters: An Introduction

Welcome to *Arduino Experimenters*! In this camp, you'll be exploring the wonderful world of Arduino. But first, let's take a look at what the Arduino is.

What is an Arduino?



An *Arduino* is a device that allows you to create software that interacts with electrical components. With an Arduino, you can read electrical inputs and control electrical outputs.

It uses what is called a *microcontroller*. A microcontroller is a small computer that is stored on a single chip. It contains a processor, memory, and inputs and outputs.

> *The Arduino is based on the ATMEGA8 and the ATMEGA168 chips.*

Accessibility

The Arduino was designed to be very accessible. They are relatively inexpensive and you can program it using a Mac, Windows, or Linux computer. It uses the Processing programming environment which looks a lot like Java or C.

The Arduino is also *Open Source* both in software and hardware. This means that there are a lot of free resources and help available online and that inventors can use the Arduino as the brains of their products and prototypes without paying license fees.

This open nature has greatly increased the adoption of Arduino devices and have spurred the creation of a number of Arduino compatible accessories and software.

Because Arduinos are open source, people are free to create their own version of Arduino devices that serve specific needs. Very powerful Arduinos power a number of 3D printers and small compact Arduinos are the go-to base for many wearable electronics projects.

Experimenting with Arduino

There are two aspects to working with an Arduino: the first is the **hardware** which includes the board itself and all of the components that attach to it. Here are some of the components that you'll be working with during this camp:

- Breadboards
- Jumper wires
- LEDs

- Resistors
- Photoresistors
- Potentiometers
- Piezo speakers

The second aspect of the Arduino is the software IDE where all of the code is written. This is where you develop, and then upload, the code that controls the Arduino board and the electronic components for each project.

Expectations

Throughout the camp you'll be diving in to lots of different projects as you're presented with new skills and concepts. You're going to be learning some programming fundamentals as you work through the projects.

The instruction will be a mixture of *direct instruction* from the program staff, *hands-on experimenting* with the projects, and following *project guides*.

Each day you'll be working on some form of a hands-on Arduino project. As you build your skills, you'll have more options and opportunities to expand into other projects.

Responsibilities

There are several project kits that contain the key components that you'll be using in the camp.

You're responsible for the content of the kits!

The kits include the following items:

- Uno board
- Solderless breadboard
- Jumper wires
- Resistor pack
- LED pack
- Pushbutton
- Photoresistor
- Potentiometer
- Piezo speaker

At the end of camp each day, you must put away all of the items into your kit!

Now that you understand that, let's jump into the software!