

# Arduino

Matt Coles

November 10, 2015

## 1 Set Up

Today we'll be playing with Arduino and working through some of the circuits listed here:

<http://ardx.org/src/guide/2/ARDX-EG-00ML-DD.pdf>

Start by getting the software running and start setting up CIRC-01 You will need the following code:

<http://www.math.ubc.ca/~colesmp/FSL/LED.txt>

Once your light blinks try to change things about the code to change the blinking.

## 2 8 LEDs

Once you are content with your 1 blinking LED try 8 LEDs in CIRC-02. You can run lots of different code to change how the LEDs light up. We'll go through few examples and then you can try to write some code to make interesting patterns. The full code for the example can be found here:

<http://ardx.org/src/circ/CIRC02-code.txt>

## 2.1 8 LEDs without loops

Once you've set it up run with the code:

[http://www.math.ubc.ca/~colesmp/FSL/LED8\\_1.txt](http://www.math.ubc.ca/~colesmp/FSL/LED8_1.txt)

You should be able to see why the code is working. It's just doing what we did with the 1LED over and over again. However, there sure was a lot of typing involved telling Arduino to turn on each light one at a time. Imagine if you had 100 lights. Fortunately we can write code efficiently using loops.

## 2.2 8 LEDs with Loops

We can do the exact same thing but simpler if we use a loop. This will allow us to perform many actions with just a few lines of code. The following does exactly the same thing but is much shorter.

[http://www.math.ubc.ca/~colesmp/FSL/LED8\\_2.txt](http://www.math.ubc.ca/~colesmp/FSL/LED8_2.txt)

## 2.3 More 8LEDs with Loops

If you include if statements you can get a lot of different patterns with the blinking lights. Here are a few:

[http://www.math.ubc.ca/~colesmp/FSL/LED8\\_3.txt](http://www.math.ubc.ca/~colesmp/FSL/LED8_3.txt)

[http://www.math.ubc.ca/~colesmp/FSL/LED8\\_3\\_2.txt](http://www.math.ubc.ca/~colesmp/FSL/LED8_3_2.txt)

[http://www.math.ubc.ca/~colesmp/FSL/LED8\\_3\\_3.txt](http://www.math.ubc.ca/~colesmp/FSL/LED8_3_3.txt)

[http://www.math.ubc.ca/~colesmp/FSL/LED8\\_4.txt](http://www.math.ubc.ca/~colesmp/FSL/LED8_4.txt)

Think up your own pattern and building off one of the above try to write your own code to perform your pattern.

# 3 Play!

Now that you have the basics, play around with the code and the circuits.

If you're into the coding try write something complicated. I'll be really impressed if you can get Arduino to solve a math problem and then display the output somehow.

If you're into the circuits try and make one or more of the other circuits in the Master Guide. They get more complicated but also get pretty cool.