**A Jumpstart to Programming
Your Surroundings**

Introducing Arduino

Presented by Arch Reactor

What's an Arduino?

Arduino is an open-source electronics prototyping platform intended for artists, designers, hobbyists, and anyone interested in creating interactive objects or environments.

The Arduino platform is:

- A physical board design
- A programming environment
- A development philosophy

What we're doing today

- Load an existing program to the board
- Modify a sample program
- Talk about some basic electronics and programming concepts

Let's get started!
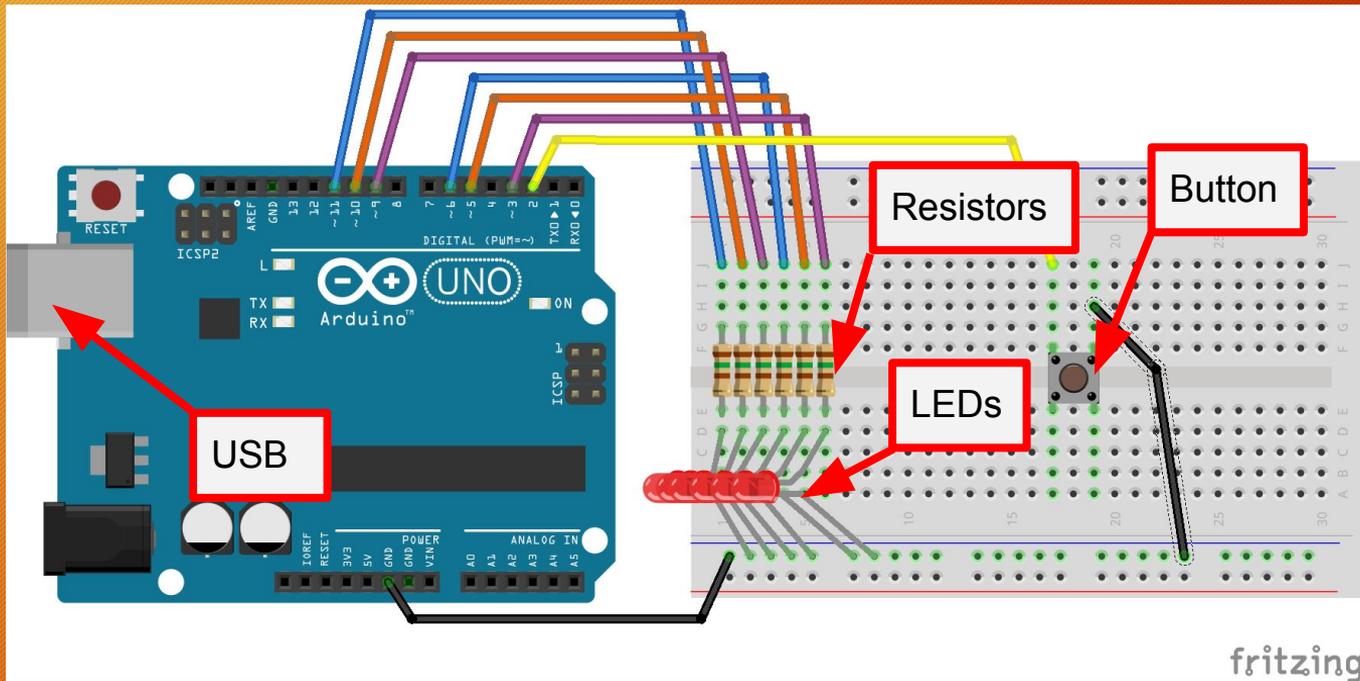
Our Prototype
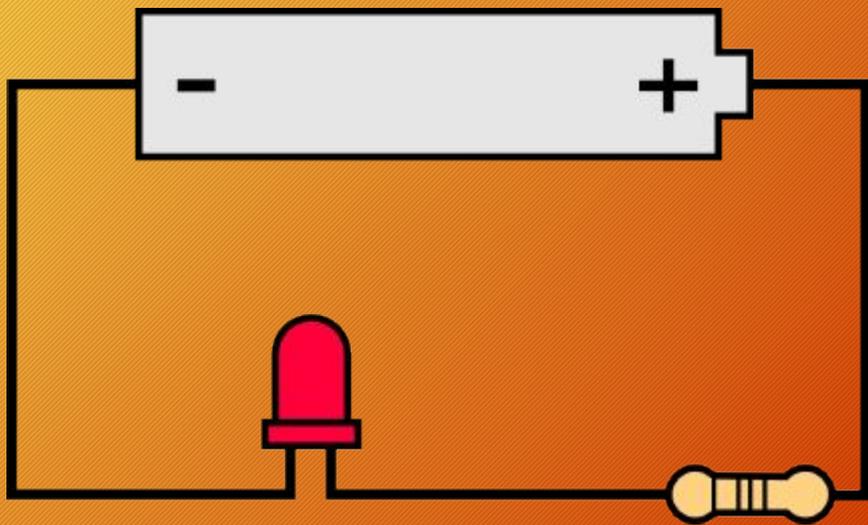
LED
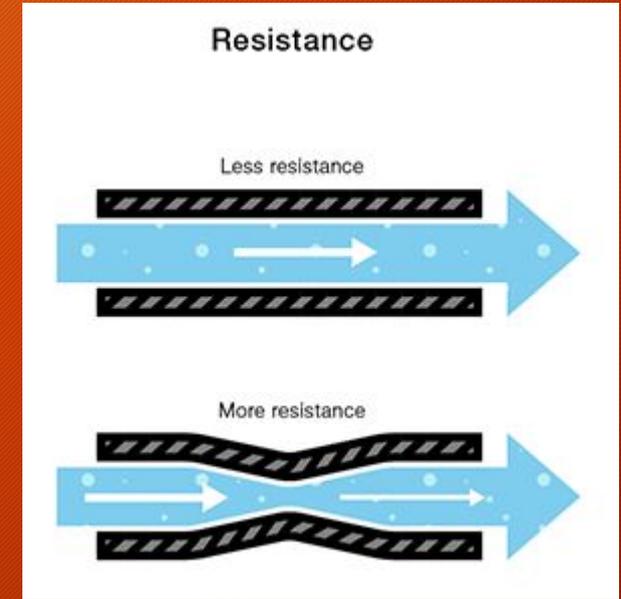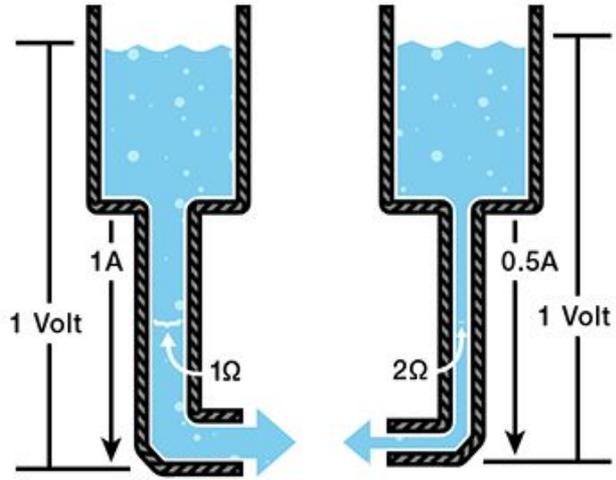
Resistors
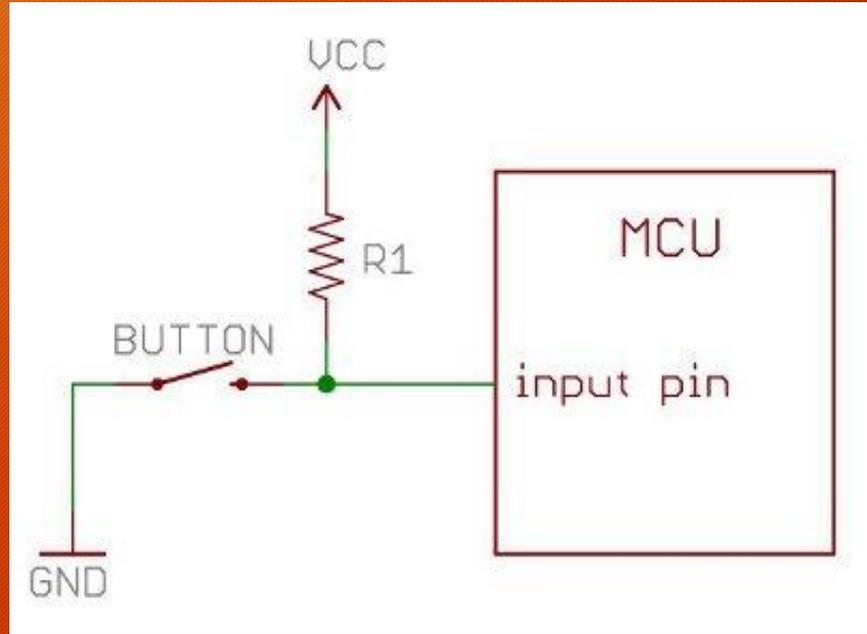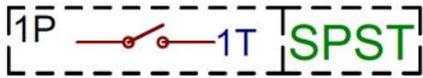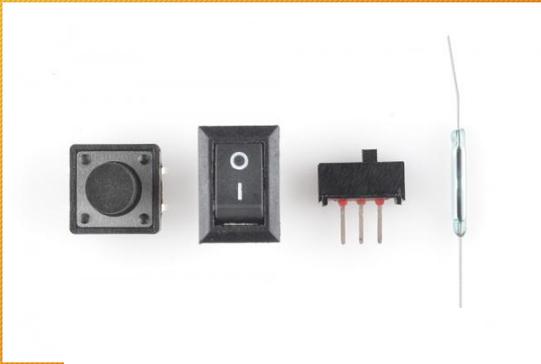
Buttons and Switches

IDE and Sketch

IDE = Integrated Development Environment

Sketch = The code.

File
Sketchbook
    BrightIdeasArduino
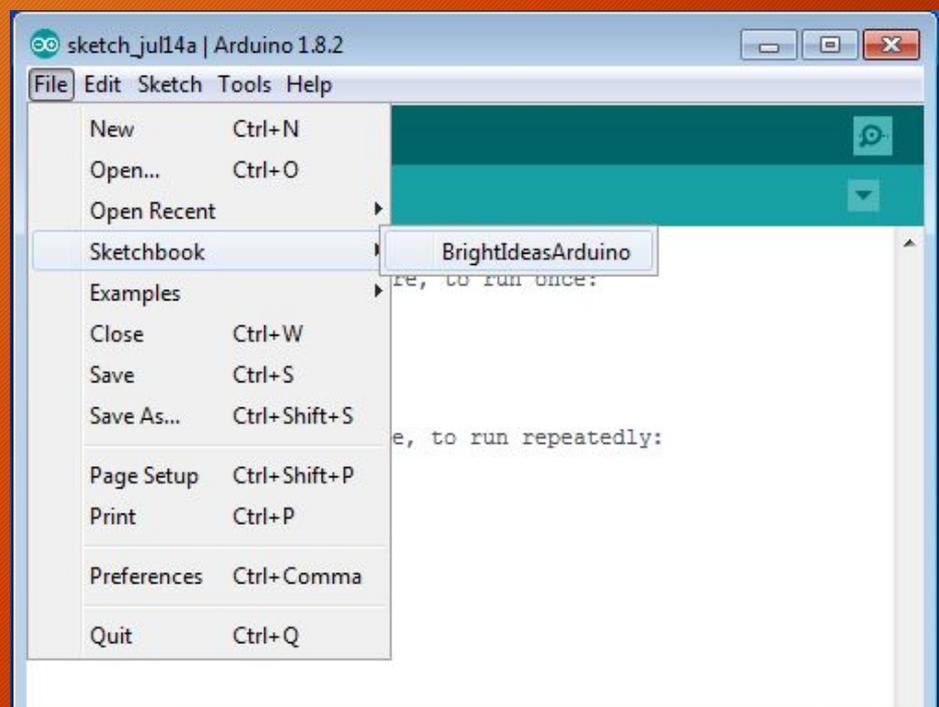
Open the
BrightIdeasArduino Sketch

- Int - whole number from -32,768 to 32,767
- Long - whole number from -2,147,483,648 to 2,147,483,647
- Char - Character code value (ASCII -127 to 127)
- Float - 6 or 7 digit decimal number
- Unsigned - can't be negative but holds a larger number
  - Int - 0 to 65,535
  - Long - 0 to 4,294,967,295
  - Char - 0 to 255
- Arrays - {} and [] - hold multiple values under one name

Variables

- **Keywords - OUTPUT, INPUT, LOW, HIGH**
- **pinMode() - Setup**
- **digitalRead() - Input**
- **digitalWrite() - Output**
- **analogWrite() - Output, only works on some pins**
- **analogRead() - Input, only works on some pins**
- **delay() - Timing**
- **millis() - Timing**

Functions

- == "is equal to" (true if values are equal, false otherwise)
- != "is not equal to" (true if values are different)
- > "is greater than" (true if left operand is greater than right operand)
- < "is less than" (true if left operand is less than right operand)
- >= "is greater than, or equal to" (true if left operand is greater than, or exactly equal to, right operand)
- <= "is less than, or equal to" (true if left operand is less than, or exactly equal to, right operand)

Comparing Values

- **if()else for() while()**
- **&& Logical "and"**
- **|| Logical "or"**
- **() Logic grouping - a && b || c is different than a && (b || c)**
- **{} Code grouping - functions, groups, conditions, scope.**

Logic

Math

- **+ - / * - Addition Subtraction Division Multiplication**
- **Math does not change a variable's value by itself**

Assignment

- **= (equal assignment) Overwrite a variable with a new value**
- **+= (addition assignment) Add a value to a variable's existing value**
- **-= (subtraction assignment) Subtract a value to a variable's existing value**

Math and Changing Values
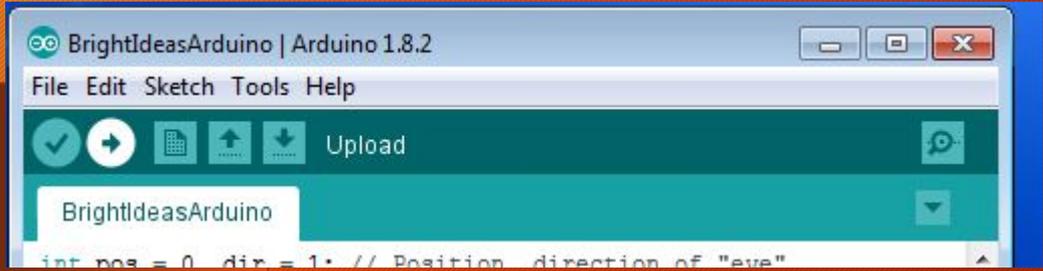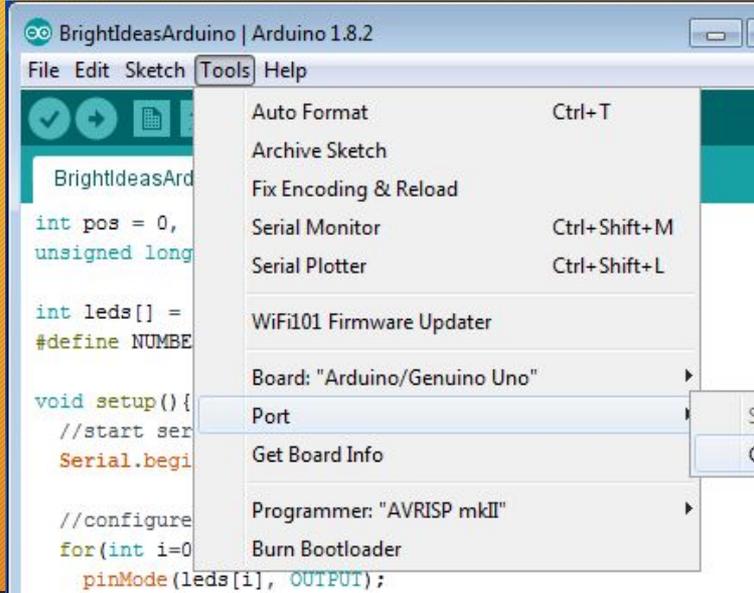
Board "Arduino/Genuino Uno"

Upload Sketch

Success or Failure?

What would you like to make?

Next Steps

http://arduino.cc/

http://learn.sparkfun.com/

https://learn.adafruit.com/

Watch Arch Reactor's calendar and discussion group for the next Arduino class

http://archreactor.org/