# Robotics/Electronics Lesson 6

## Overview

In this lesson students will lean to create a controllable robotic arm while drinking bubble tea (*hopefully).

## Plan

1. Analog vs Digital
2. Servo
3. Potentiometer
4. Robotic Arm Code
5. Robotic Arm Design
6. Robotic Arm Wiring
7. Electronics led sign

### Analog vs Digital

Reference Link

Analog is measured.

Digital is counted.

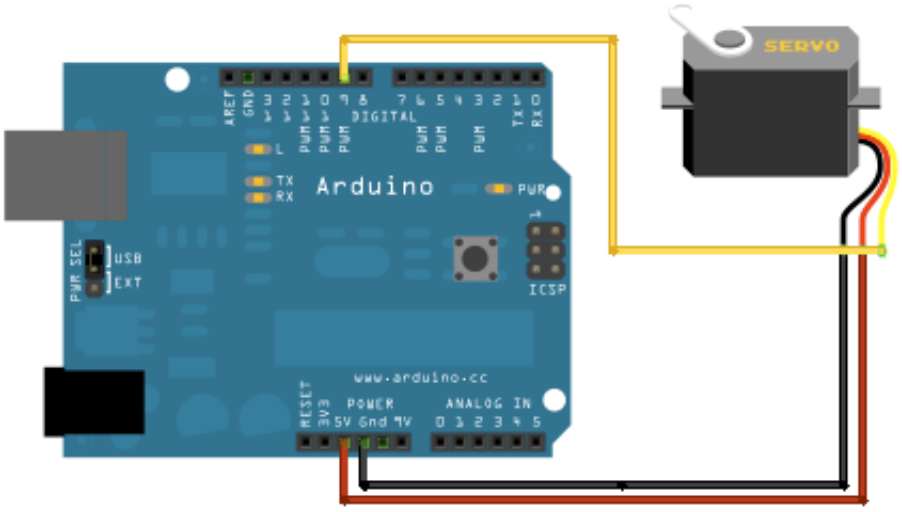
Example: Cake recipe requires 2 cups of flour (analog since you aren't getting exactly 2 cups) and 2 eggs (digital since it's exactly 2).

### Servo

#### HUDDLE

Students: Where are motors used? ie. cars, robots, planes

Servos moves 180 degrees.

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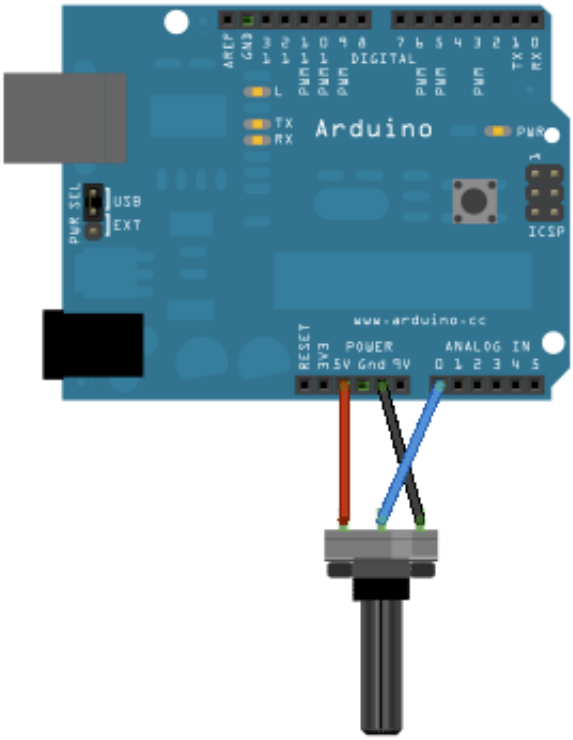
## Potentiometer

Potentiometer is an adjustable resistor. As you turn the knob it will increase or decrease the resistance which then can be measured.




*Potentiometer*

## Robotic Arm Code

### Coding Tutorial Link

A robotic arm requires the potentiometer and servo. Potentiometer will return a value that will adjust the rotation of the servo.

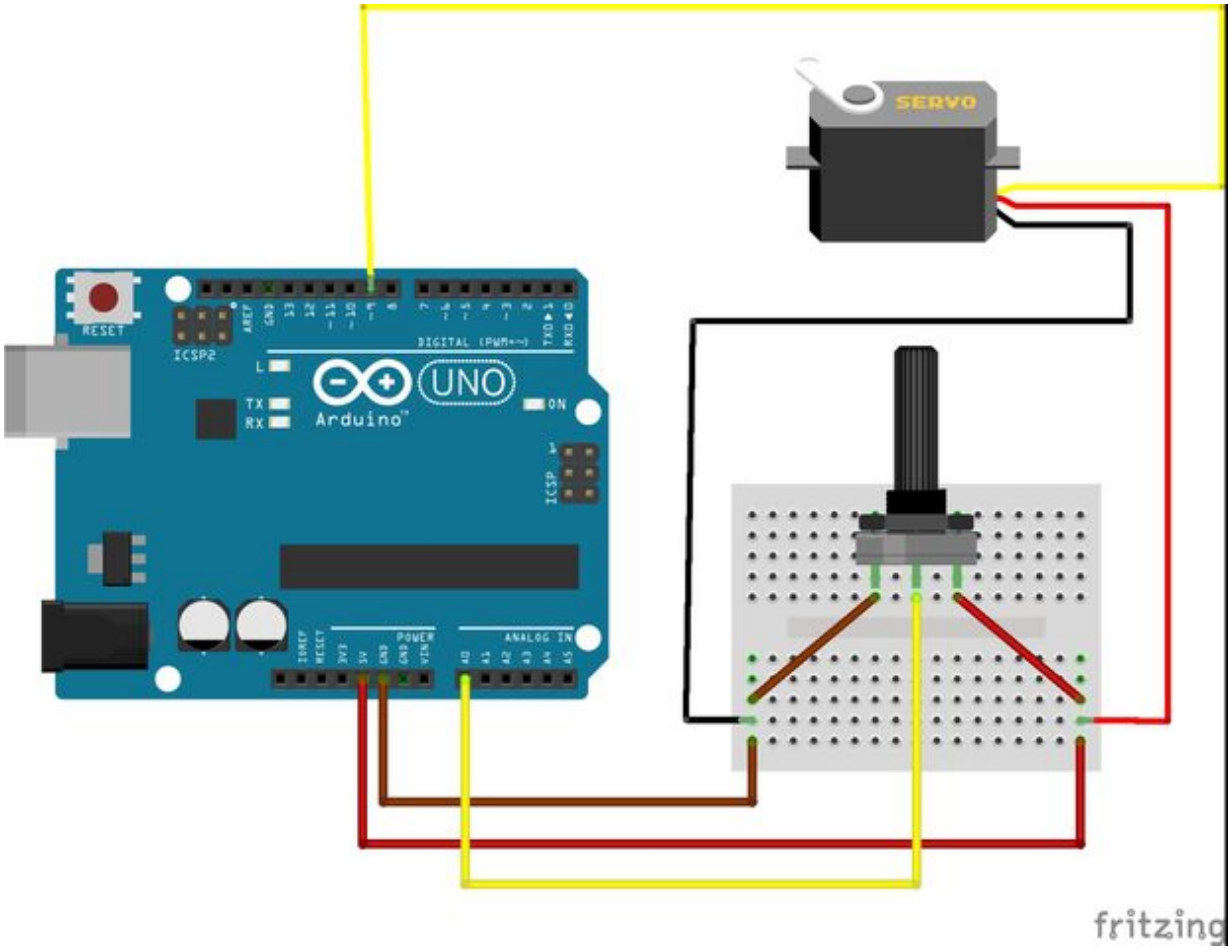
```
#include <Servo.h>

Servo myservo;  // create servo object to control a servo

int potpin = 0;  // analog pin used to connect the potentiometer
int val;    // variable to read the value from the analog pin

void setup() {
  myservo.attach(9);  // attaches the servo on pin 9 to the servo object
}

void loop() {
  val = analogRead(potpin);            // reads the value of the potentiometer (value between 0 and 1023)
  val = map(val, 0, 1023, 0, 180);     // scale it to use it with the servo (value between 0 and 180)
  myservo.write(val);                  // sets the servo position according to the scaled value
  delay(15);                           // waits for the servo to get there
}
```

## Robotic Arm Design

Students will create a mini robotic arm out of paper or cardboard and tape.

## Robotic Arm Wiring

Wiring Youtube Tutorial Link




## Electronics led sign

The last part of the class we will have the students and assistants create an led sign with the word electronics and light it up with the lights turned off!!!

*Give out contact information and end the class with a speech (assistants and instructors)*