Joystick Controlled Stepper Motor Project

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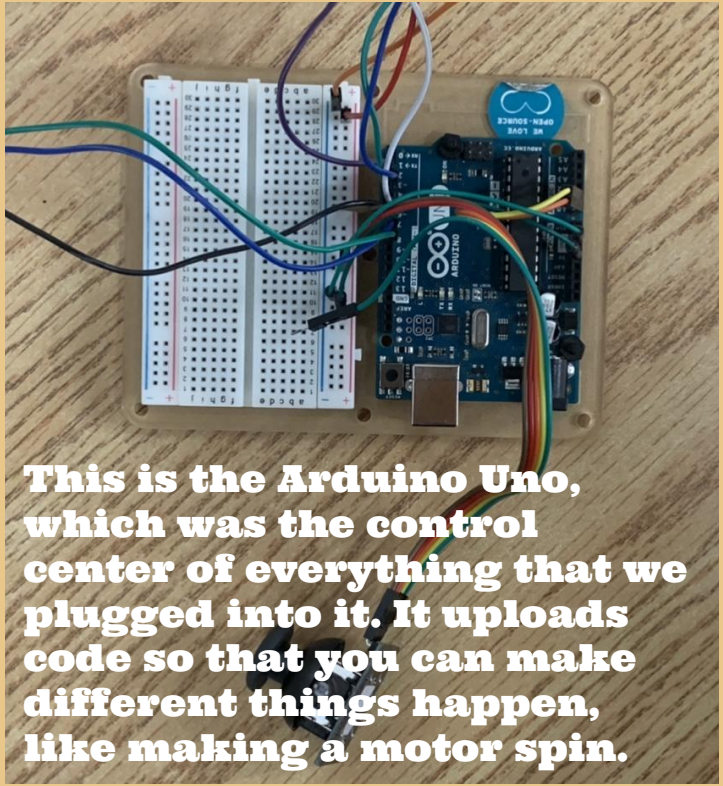
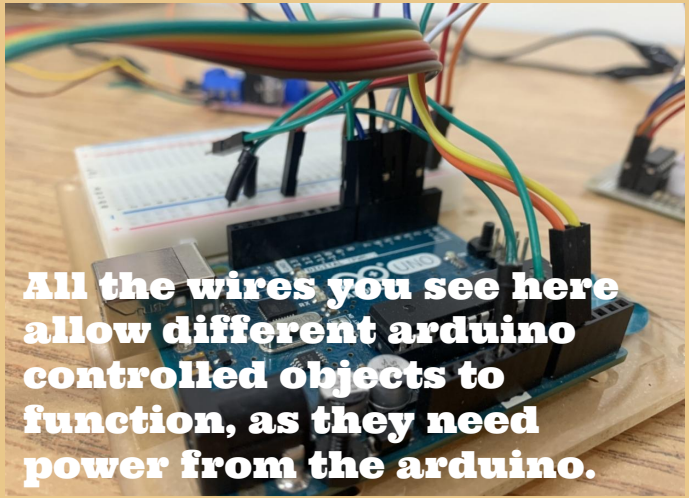
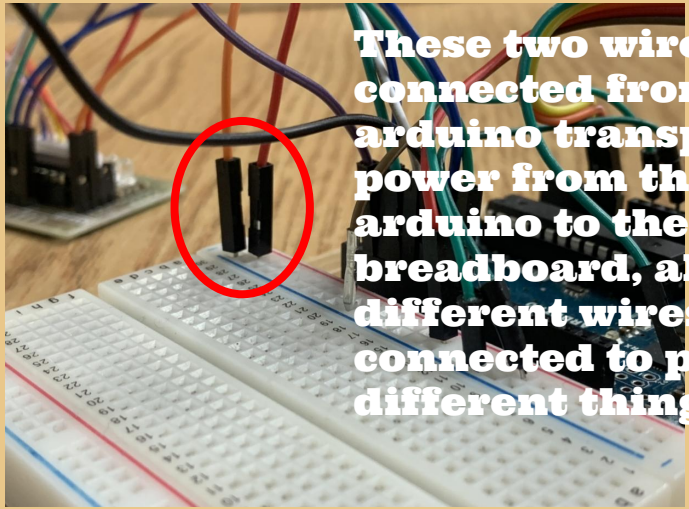
Arduino Wiring



This is the Arduino Uno, which was the control center of everything that we plugged into it. It uploads code so that you can make different things happen, like making a motor spin.



All the wires you see here allow different arduino controlled objects to function, as they need power from the arduino.

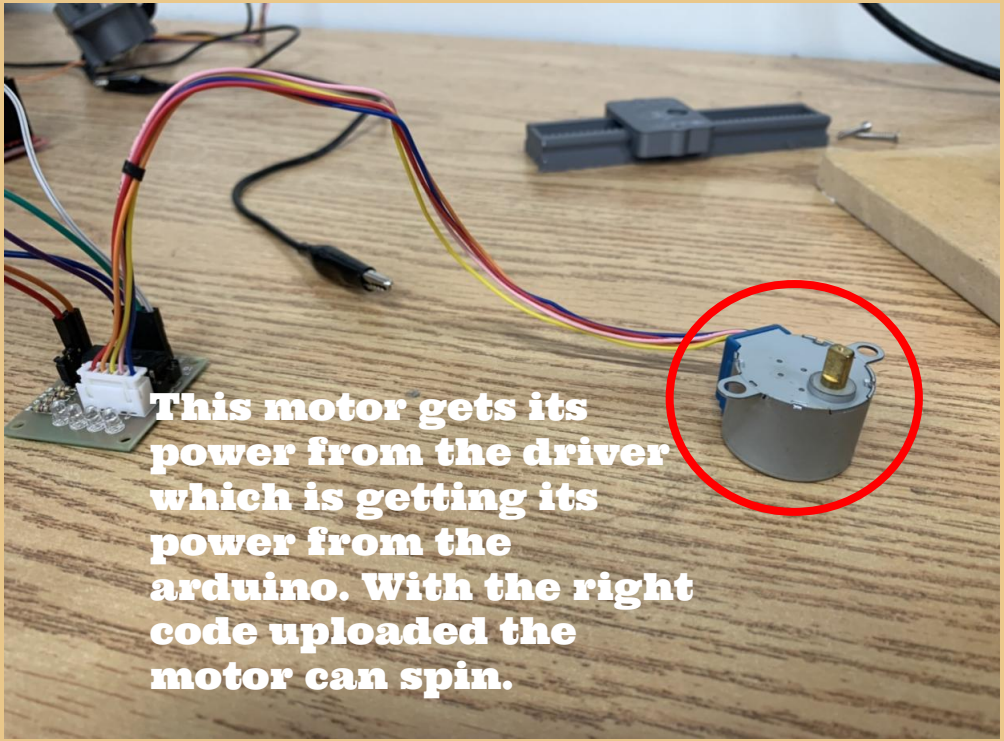


These two wires connected from the arduino transport power from the arduino to the breadboard, allowing different wires to be connected to power different things.

Driver = Control Panel

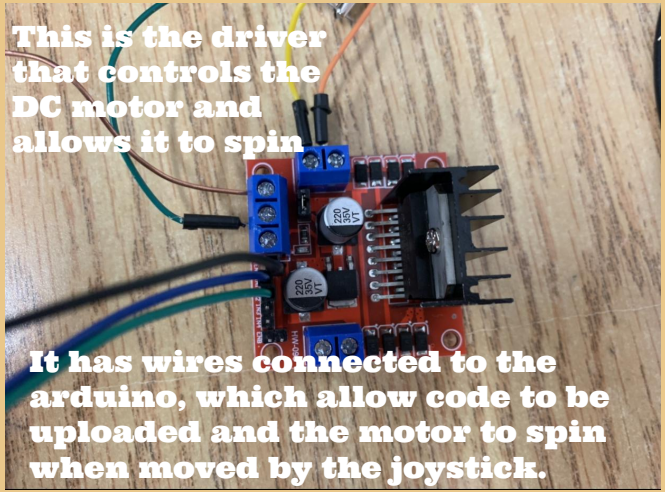
Stepper Motor Wiring

This is the driver that controls how the stepper motor moves.

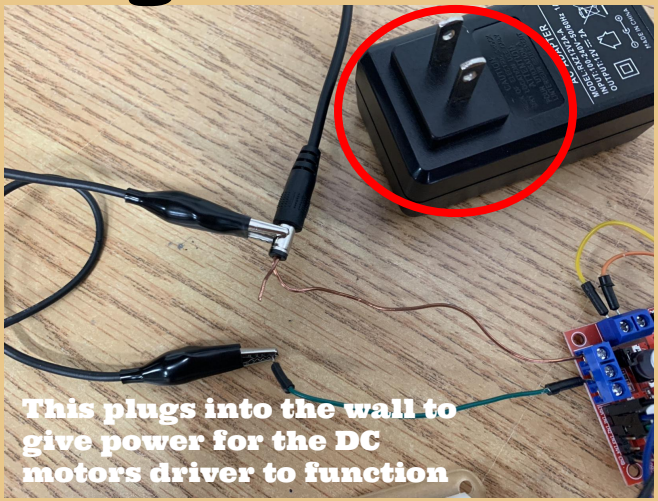


This motor gets its power from the driver which is getting its power from the arduino. With the right code uploaded the motor can spin.

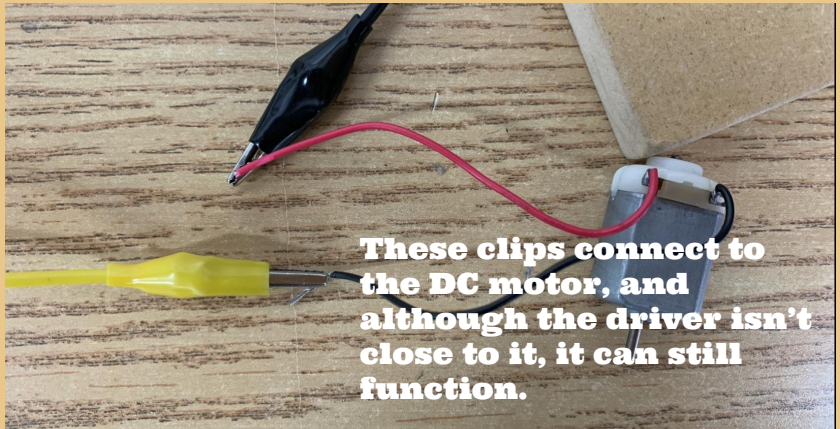
DC Motor Wiring

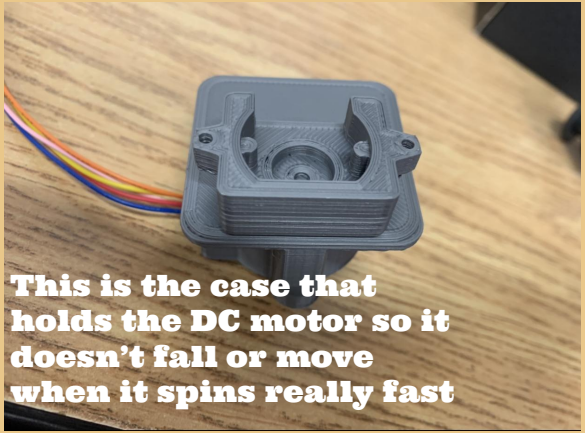


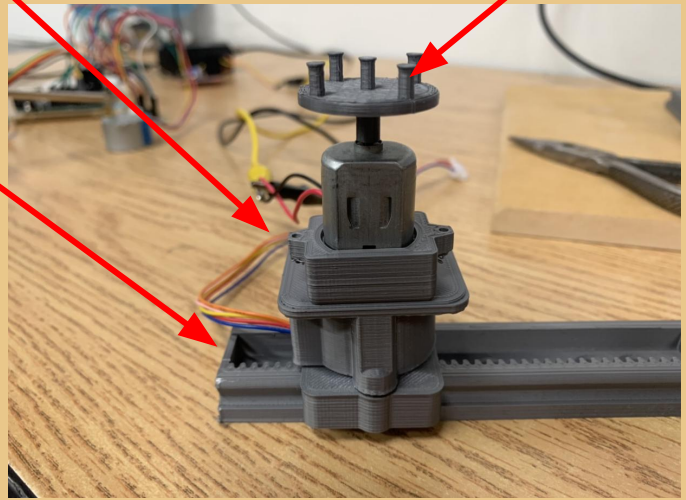
Connect driver to power



Connect driver to DC motor







Print Out Parts and Put Them Together

Coding...

01000011 01101111 01100100 01101001 01101110 01100111 00001101 00001010

Define... they are separated by sections

```
1
2  //begining of define for joystick
3  #define joyX A0
4  #define joyY A1
5
6   int xValue = 0;
7   int yValue = 0;
8   //end of define for joystick
9
10 //steppermotor
11 #define A 2
12 #define B 3
13 #define C 4
14 #define D 5
15
16 #define NUMBER_OF_STEPS_PER_REV 512
17 //steppermotor end
18
19 //motor
20 int enB = 6;
21 int in3 = 7;
22 int in4 = 8;
23 //motor end
24
```

Define the pins for joystick

Define the pins for stepper motor

Define the pins for dc motor

Setup... they are separated by sections

```
void setup() {
  Serial.begin(9600);
  //stepper motor
pinMode(A,OUTPUT);
pinMode(B,OUTPUT);
pinMode(C,OUTPUT);
pinMode(D,OUTPUT);
//stepper motor end

//motor
  pinMode(enB, OUTPUT);
  pinMode(in3, OUTPUT);
  pinMode(in4, OUTPUT);
          // Turn off motors - Initial state
  digitalWrite(in3, LOW);
  digitalWrite(in4, LOW);
//motor end
}
```

Setup for joystick

Setup for stepper motor

Setup for DC motor

One step = One tick

Stepper Motor Functions for one step

```
 void write(int a,int b,int c,int d){
digitalWrite(A,a);
digitalWrite(B,b);
digitalWrite(C,c);
digitalWrite(D,d);
}

void onestep(){
write(1,0,0,0);
delay(1);
write(1,1,0,0);
delay(1);
write(0,1,0,0);
delay(1);
write(0,1,1,0);
delay(1);
write(0,0,1,0);
delay(1);
write(0,0,1,1);
delay(1);
write(0,0,0,1);
delay(1);
write(1,0,0,1);
delay(1);
}
```

This is a function that allows the stepper motor to move one single step. All of these voltages need to be applied to the motor in order to get it to spin

```
void onestep1(){
write(0,0,0,1);
delay(1);
write(0,0,1,1);
delay(1);
write(0,0,1,0);
delay(1);
write(0,1,1,0);
delay(1);
write(0,1,0,0);
delay(1);
write(1,1,0,0);
delay(1);
write(1,0,0,0);
delay(1);
write(1,0,0,1);
delay(1);
}
```

The “1” represen an individual step

DC Motor Functions for rotations

```
 //motor stuff
 void directionControl() {
  analogWrite(enB, 255);
  digitalWrite(in3, HIGH);
  digitalWrite(in4, LOW);
}

void directionControl1() {
analogWrite(enB, 155);
  digitalWrite(in3, LOW);
  digitalWrite(in4, HIGH);
}

void directionControlOff() {
  analogWrite(enB, 155);
  digitalWrite(in3, LOW);
  digitalWrite(in4, LOW);
}
 //end of motor stuff
```

This number determines the speed of the motor

This is a function that makes the motor spin either right or left. It works by providing power (ass seen by the HIGH) through one of the pins to one of the magnets in the motor to make it spin either way

Loop

```
void loop() {
  //joystick begin
  xValue = analogRead(joyX);
  yValue = analogRead(joyY);

  Serial.print(xValue);
  Serial.print("\t");
  Serial.println(yValue);
  //joystick end

  if (yValue > 691) {
  onestep1();
  }

if (xValue > 700) {
  directionControl();
  } else if (xValue < 700 && xValue > 200) {
  directionControlOff();
}

if (xValue < 200) {
  directionControl1();
}



  if (yValue < 250 ) {
    onestep();
  //   directionControl1();
  // } else {
  //     directionControlOff();
}

}
```

Joystick- Prints value in serial monitor

Stepper motor- Checks value of serial monitor and spins

DC motor- checks value of serial monitor and spins also

Stepper motor- Checks value of serial monitor and spins

Oreo Spin Test

(Bens' wasn't spinning because a wire wasn't plugged in)

How We Made The Holes

We drilled holes in the oreos so we could place them on the pegs

Videos of the Final Product

Thank You!