

IN SCHOOL

November 13, 2023 Block F

Jerry and Josh

Day #1

- To start Jerry and Josh took apart the nerf gun, so they can access the motor. Josh accidentally broke a wire connecting the motor to the battery, and when trying to find where it came from they were able to activate it without the buttons being pressed.

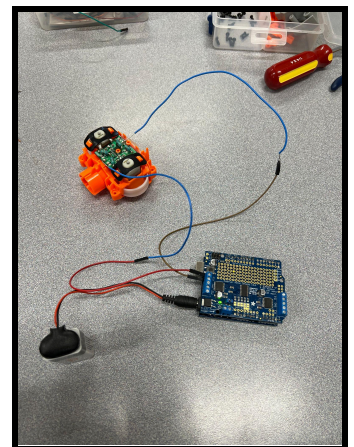


November 14, 2023 Block F

Jerry and Josh

Day #2

- For the second day Josh and Jerry started the process of controlling the motor. To do this they first found where the power enters the motor, then they resoldered wires to the motor and started to connect it to a motor shield, but ran out of time in class.
- <https://www.instructables.com/Arduino-Motor-Shield-Tutorial/>



November 16, 2023 Block F

Jerry and Josh

Day #3

- Jerry and Josh figured out that they're going to need to use another motor to control the shooting of the gun. To do this they've decided to learn how to use the servo motor for this. At the end of class they got the servo motor and found a website to learn more.
- <https://learn.adafruit.com/adafruit-motor-shield-v2-for-arduino/using-rc-servos>
- <https://www.instructables.com/Arduino-How-to-Control-Servo-Motor-With-Motor-Shie/>

November 17, 2023 Block F

Jerry and Josh

Day #4

- Josh and Jerry continued to work with the servo motor and got it to a point where they like the amount of rotation it has and the speed it goes. They also reattached the part of the gun that holds the mag in the actual frame on the gun. Finally to end the class they decided how to attach the servo motor to the trigger system in the gun.

November 20, 2023 Block F

Jerry and Josh

Day #5

- For this day Jerry and Josh figured out what powersource they're going to use for the motors. They also started to figure out how they're going to use the infrared sensor to activate it.

November 21, 2023 Block F

Jerry and Josh

Day #6

- Josh and Jerry talked about what sensor they are going to use to activate the nerf gun.

November 27, 2023 Block F

Jerry and Josh

Day #7

- Both Josh and Jerry tried to get the infrared sensor to work, however it didn't have enough of a range that they wanted so they decided to use an ultrasonic sensor instead.

November 28, 2023 Block F

Jerry and Josh

Day #8

- Jerry and Josh started to code the arduino to activate the gun and shoot 7 darts when a door opens using an ultrasonic sensor.

November 30, 2023 Block F

Jerry and Josh

Day #9

- Josh and Jerry continued to change their code so the nerf gun will shoot darts when a door is opened, however they ran into a problem where the ultrasonic sensor won't give a proper reading.

December 1, 2023 Block F

Jerry and Josh

Day #10

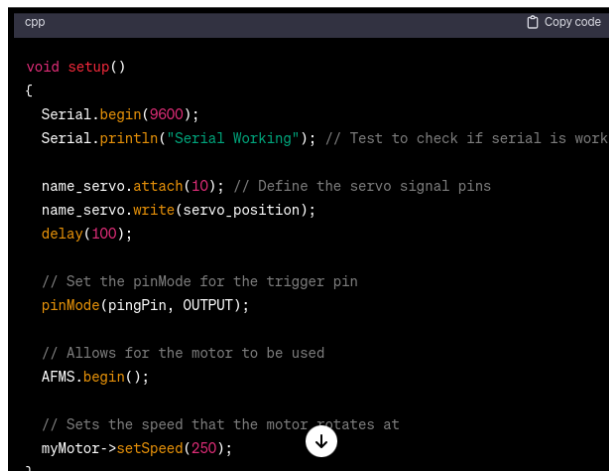
- Jerry and Josh corrected their code, so the motor will work and shoot the exact amount of darts they want. They also attempted to get the ultrasonic sensor working in their final code, but with no success. The reading on the sensor counts 0 inches most of the time, then randomly jumps back to what it's supposed to say. They have a program without the motor and servo and the sensor works perfectly, they're just having issues porting it into their completed sketch with all the other electronic factors in the way.

December 4, 2023 Block F

Jerry and Josh

Day #11

- Josh and Jerry, with the help of Chat GPT, figured out that their code wasn't working because Jerry forgot to copy two lines of code to make the ultrasonic sensor work. With the rest of the period Jerry and Josh tried to figure out the distance needed in order to reach the door and activate the motor.



```
cpp Copy code

void setup()
{
  Serial.begin(9600);
  Serial.println("Serial Working"); // Test to check if serial is worki

  name_servo.attach(10); // Define the servo signal pins
  name_servo.write(servo_position);
  delay(100);

  // Set the pinMode for the trigger pin
  pinMode(pingPin, OUTPUT);

  // Allows for the motor to be used
  AFMS.begin();

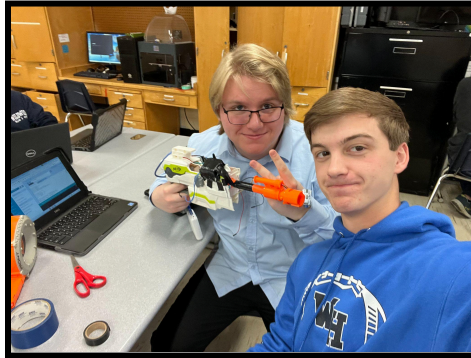
  // Sets the speed that the motor rotates at
  myMotor->setSpeed(250);
}
```

December 5, 2023 Block F

Jerry and Josh

Day #12

- With their code now mostly completed, Josh and Jerry tried to narrow down the distance to the nerf gun a person has to be in order for the motor to start. They decided on using 90 inches, however when testing this they ran into the issue where the motors would start as they should, but they wouldn't start. Also the serial monitor wouldn't stay open when the motors started, so they were unable to find the problem in the class period.



December 6, 2023 Block F

Jerry and Josh

Day #13

- Josh and Jerry worked all class trying to find the bug in their code that wouldn't let the motor stop. In reality it was stopping, but just for a very short time, and the ultrasonic sensor would get another value less than the required distance then the motor would start again. It was hard for them to find this because there wasn't enough power going into the arduino through the chromebook alone, so the serial port would stop working. This meant that they couldn't see the distance the ultrasonic was giving until Mr. Detrick told them to add more power, which resolved the serial monitor issue. However, the problem with the motor starting again is still there.

December 7, 2023 Block F

Jerry and Josh

Day #14

- For the second to last day of the learning module Jerry and Josh did their final tests on their code and didn't have to make any changes. The rest of the time was spent adjusting 3D models to hold the ultrasonic sensor. One was printed, but it was too small, so Jerry made some small adjustments and started printing a new one.

December 8, 2023 Block F

Jerry

Day #15

- The new piece that was printed was too small again, so Jerry made it bigger again and printed one more. He also started to model a case to hold the arduino because there is no time to start something new.

MAKE-UP WORK FROM ABSENT (40 minutes per day)

WORK AT HOME (Minimum of 1 hour for each 5 days of LM)

November 14, 2023 4:18 pm - 4:49 pm

Jerry

Work at home

- Jerry learned how to control the nerf gun's motor using the arduino and motor shield. In doing this Jerry and Josh will be able to control when the motor will start, how long it will run for, and how fast it will move.
- <https://learn.adafruit.com/adafruit-motor-shield-v2-for-arduino/using-dc-motors>

November 16, 2023 2:09 pm - 3:05 pm

Jerry

Work at home

- Jerry figured out the basics of how servo motors work and he started to figure out how to make it move the plunger that pushes the nerf dart into the motors.

November 19, 2023 1pm-5pm

Josh

Work at home & Make Up for 12/8

- Josh finished working on the servo trigger at home and taped the servo and arduino onto the Nerf gun. He used wire to pull an extra plastic piece from the gun and attached it loosely to the trigger in order to make up for the servo's circular nature when it moves, and set the proper angle measurements for the two 'for' loops controlling the back-and-forth motion of the servo.

December 6, 2023 2:20 pm - 2:40 pm & 8 pm - 9:20 pm

Jerry

Work at home

- To test the code again Jerry ran the code when he got home and it worked without any changes. It could be that other objects were interfering with the ultrasonic sensor when in school. Jerry also 3D modeled a part to hold the ultrasonic sensor on the barrel of the nerf gun.