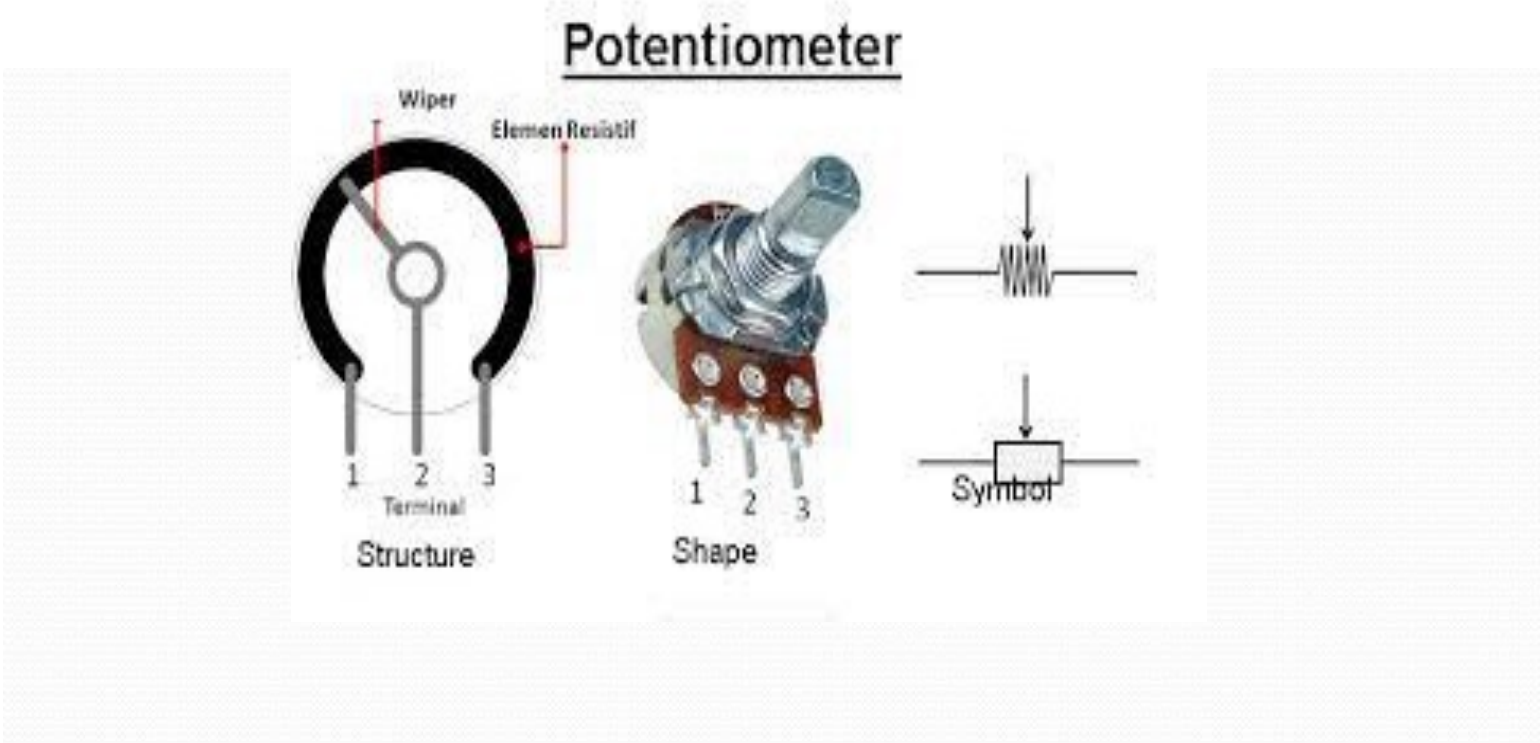
WHAT IS A POTENTIOMETER

- A potentiometer is a three-terminal resistor with a sliding or rotating contact that forms an adjustable voltage divider
- A potentiometer is three-terminal circuit element that consists of a resistor a moving constant.

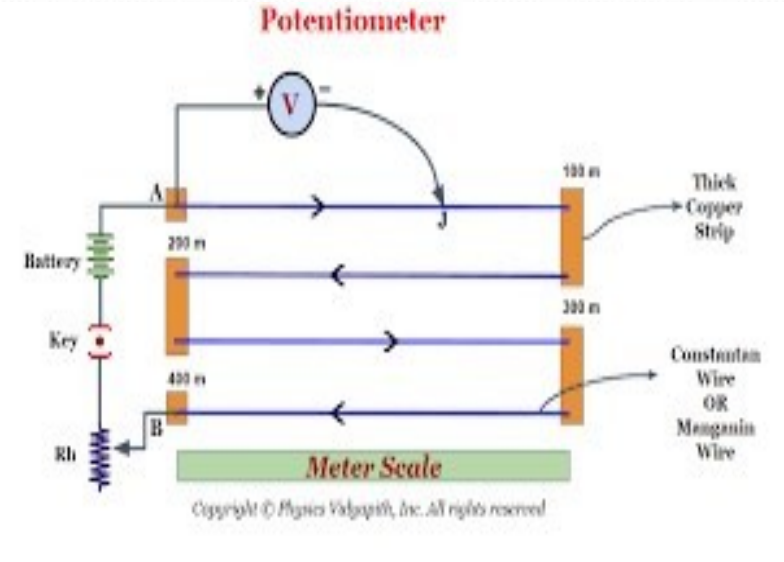


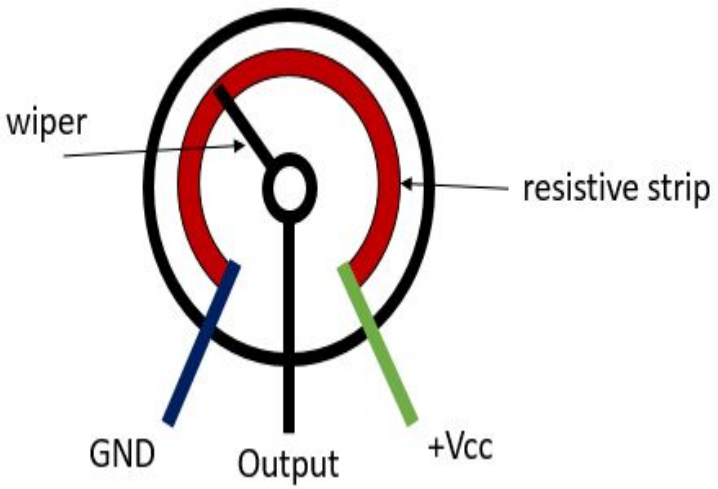
TYPES OF POTENTIOMETER

- Linear potentiometer
- Rotary potentiometer
- String potentiometer
- Logarithmic potentiometer
- Rheostat potentiometer
- Slide potentiometer
- Trimmer potentiometer

HOW POTENTIOMETER WORKS….?

- A potentiometer is a type of position sensor. They are used to measure displacement in any direction.
- A potentiometer is a three-terminal resistor with a sliding or rotating contact that forms an adjustable voltage divider. If only two terminals are used, one end and the wiper, it acts as a variable resistor or





USE OF POTENTIOMETER

- They are used to accurately measure voltage and help achieve a variable voltage from a fixed-voltage source.
- Potentiometers operated by a mechanism can be used as position transducers, for example, in a joystick.
- It is used in wood processing machine.

RANGE OF POTENTIOMETER

- Potentiometer have a range of resistance they can be attuned from zero ohms to whatever maximum resistance that is specific to it.
- FOR example, a potentiometer of 10k ohms can be adjusted from 0 ohms to its maximum of 10k ohms.

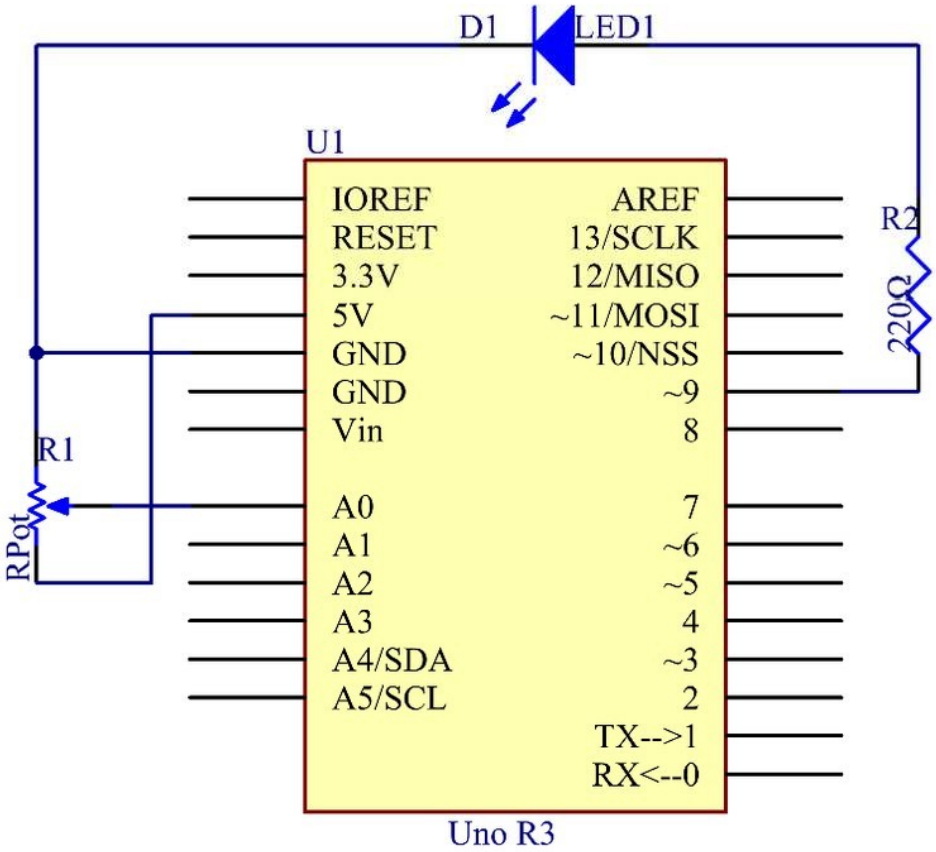
COMPONENTS

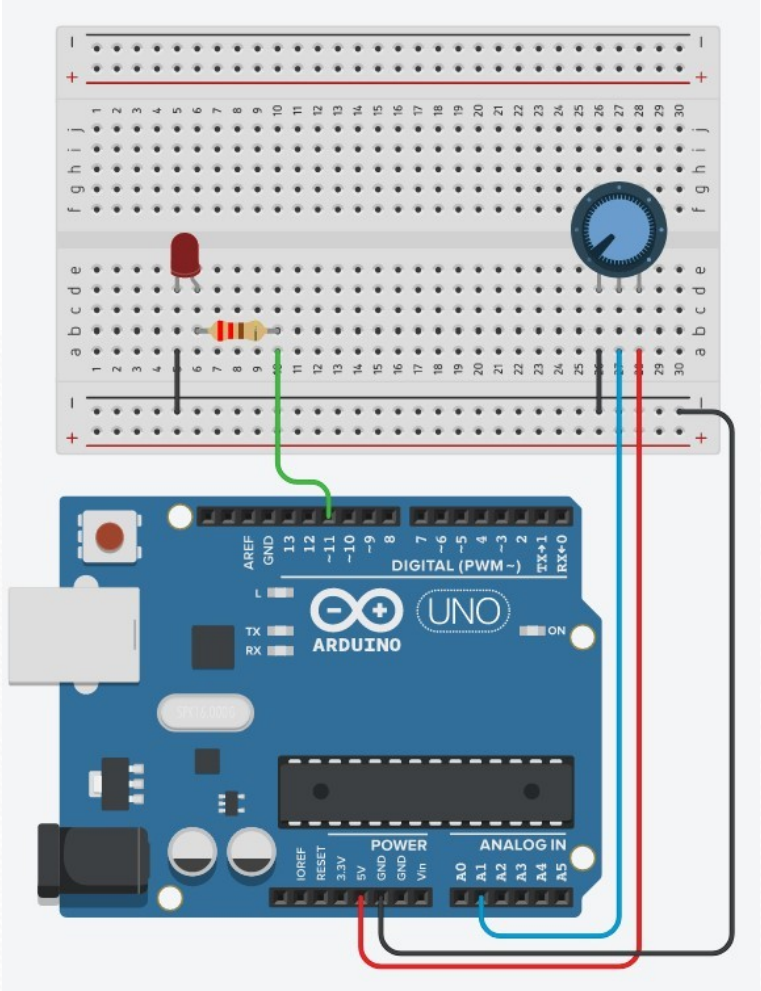
- Arduino uno board
- USB cable
- Resistor (220 ohms)
- LED
- Potentiometer
- Breadboard
- Jumper wires

PRINCIPLE

- A linear potentiometer is an analog electonic component.
- So what the difference between an analog value and a digital one? Simply put, digital means on/off, high/low level with just two states , i.e either 0 or 1.
- But the state of analog signals is linear, for example , from 1 tq 1000;the signal value change over time over time instead of indicating an exact number.
- Analog signals include those of light intensity humidity , temperature, and so on.

THE SCHEMATIC DIAGRAM





PROCEDURE

- In this experiment , the potentiometer used as voltage divider, meaning connecting devices to all of its three pins.
- Connect the middle pin of the potentiometer to pin A0 and the other two pins to 5V and GND respectively.
- Therefore, the voltage of the potentiometer is 0-5V.Spin the knob of the potentiometer, and the voltage at pin A0 will change.
- Then convert that voltage into a digital value (0-1024) with the AD converter in the control board
- Through programming, we can use the converted digital value to control the brightness of the LED on the control board.
- universal asynchronous receiver-transmitter, is one of the most used device-to- device communication protocols.
- The potentiometer should be connected to one Ardunio.
- LED should be connected to other ardunio. The communication between should be UART.
- The potentiometer data should be using UART to LED ardunio to control the brightness using PWM.

PROGRAM FOR COUNTROL THE BRIGHTNESS OF LED

```
1.  #define LED_PIN 11
2.  #define POTENTIOMETER_PIN A1
3.
4.  void setup()
5.  {
6.    pinMode(LED_PIN, OUTPUT);
7.  }
8.
9.  void loop()
10. {
11.   int potentiometerValue = analogRead(POTENTIOMETER_PIN);
12.   int brightness = potentiometerValue / 4;
13.   analogWrite(LED_PIN, brightness);
14. }
```