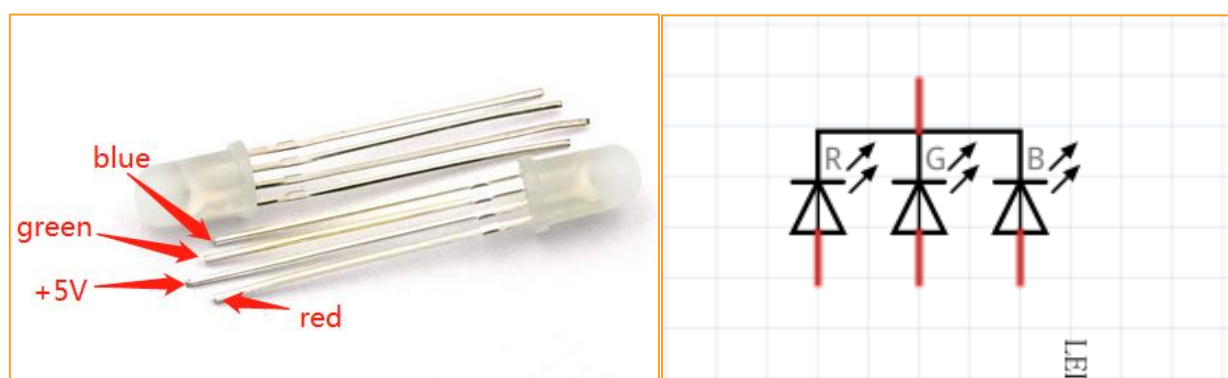


RGB LED

Introduction

The white light LED and the RGB LED both return the same way, all want to achieve the effect of white light, only one is directly in white light, the other is mixed with red, green and blue. RGB light is a combination of three primary colors, in addition, there are blue light LED with yellow phosphor, and ultraviolet LED with RGB phosphor. Overall, these two have its imaging principle. The color of some LED backlights is especially clear and bright, even with high quality TV. This is the feature of RGB, which is the characteristic of red, green, green, blue, and blue.



Component List

- ◆ Arduino Nano Mainboard
- ◆ Breadboard
- ◆ USB cable
- ◆ RGB LED*1
- ◆ Resistor (220Ω) *3
- ◆ Some wires

Experimental Principle

RGB

RGB stands for the red, green, and blue color channels, it is an industry color standard. RGB displays various new colors by changing the three channels and superimposing them, which, according to statistics, can create 16,777,216 different colors. If you say the color displayed doesn't completely match a natural color, then it almost certainly cannot be differentiated with the naked eyes.

Each of the three color channels of red, green, and blue has 255 stages of brightness. When the three primary colors are all 0, "LED light" is the darkest, that is, it turns off. When the three primary colors are all 255, "LED light" is the brightest. When superimposing the light emitted by the three primary colors, the colors will be mixed. However, the brightness is equal to the sum of all brightness, and the more you mix, the brighter the LED is. This process is known as additive mixing.

In this experiment, we will also use PWM, if you've followed the lessons thus far, you already have a basic understanding of. Here we input a value between 0 and 255 to the three pins of the RGB LED to make it display different colors.

Experimental Procedures

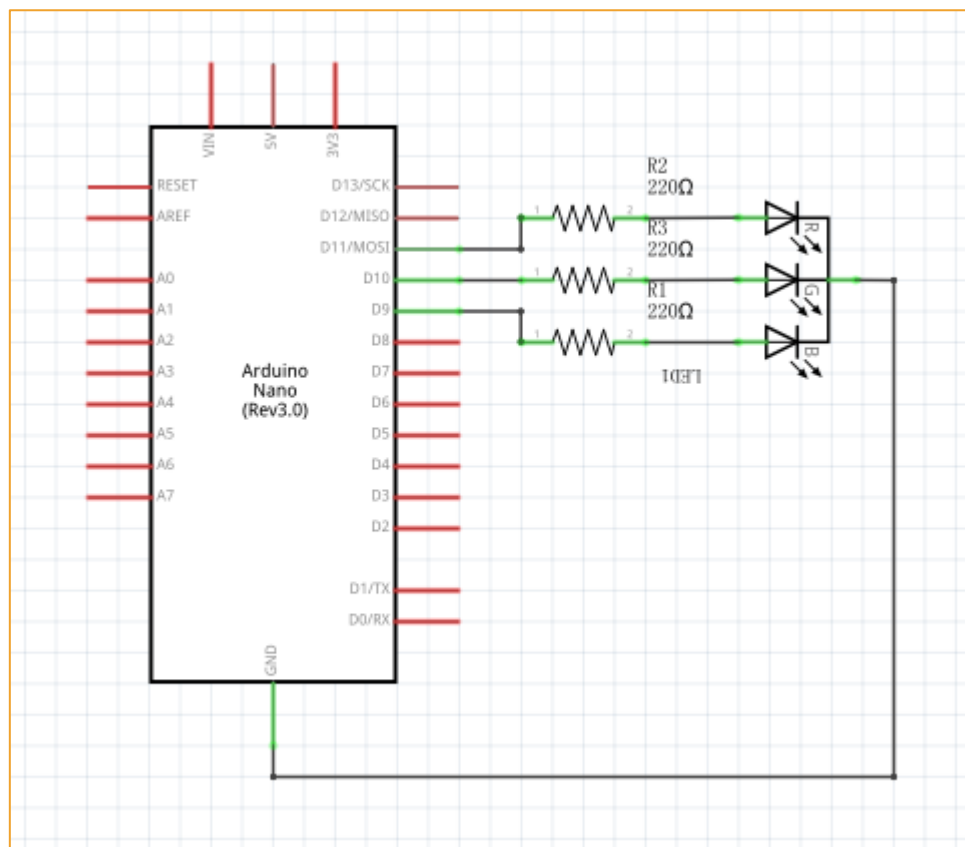
Step 1: Build the circuit

Step 2: Program (Please refer to the example code in LEARN -> Get Tutorials on our website)

Step 3: Compile the code

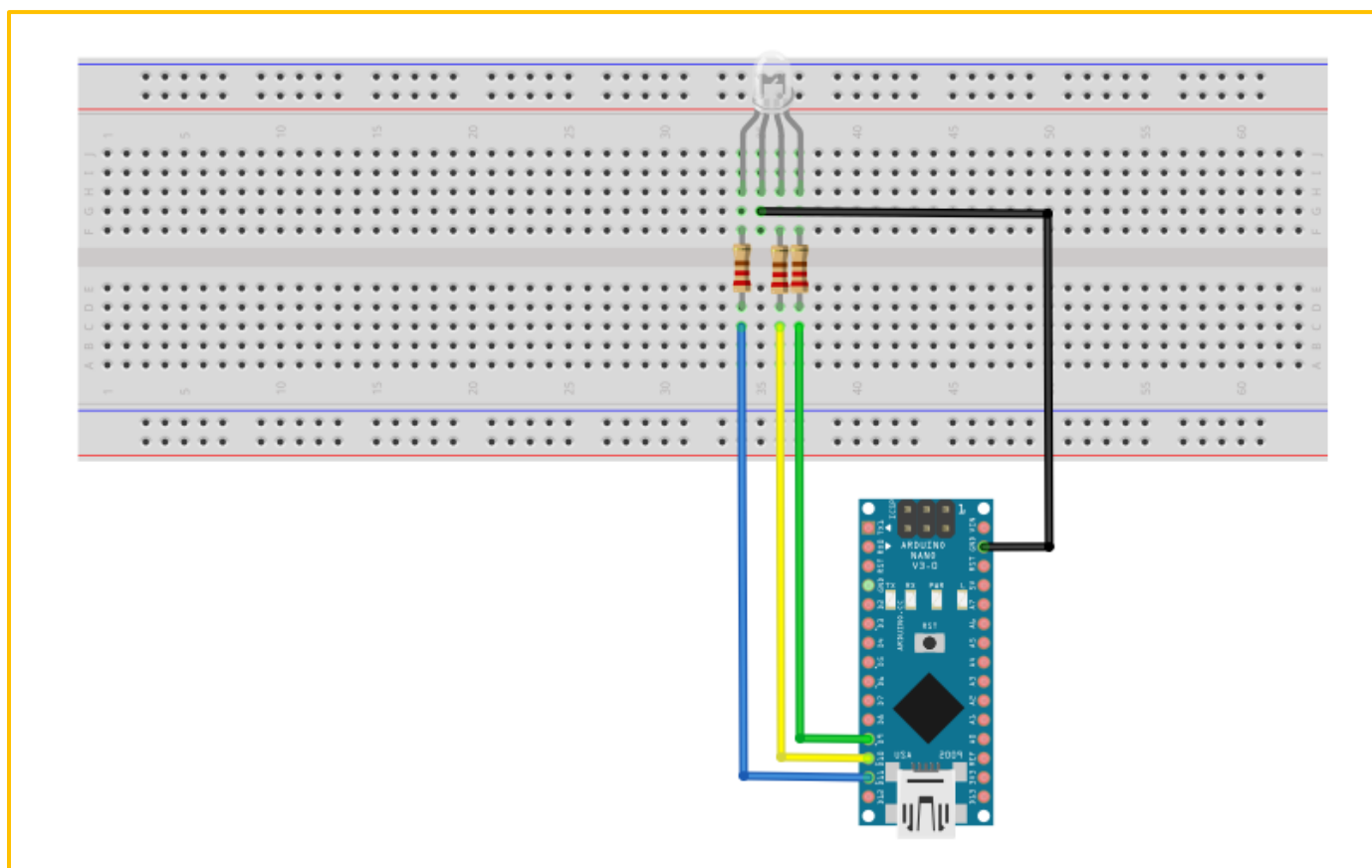
Step 4: Upload the sketch to the Arduino Nano board

Schematic Diagram



Wiring of Circuit

Arduino Nano	RGB
11	1
10	3
9	4
GND	2



Code

```
#define RGB_RED    11
#define RGB_GREEN  10
#define RGB_BLUE   9

void setup()
{
    pinMode(RGB_RED,OUTPUT);
    pinMode(RGB_GREEN,OUTPUT);
    pinMode(RGB_BLUE,OUTPUT);
}

void setColor(int red,int green,int blue)
{
    analogWrite(RGB_RED,red);
    analogWrite(RGB_GREEN,green);
    analogWrite(RGB_BLUE,blue);
}

void loop()
{
    int i;
    for (i=0; i<256; i++)
    {
        setColor(i, 0, 0);
        delay(4);
    }
    delay(500);           //turn the RGB LED red smoth

    for (i=0; i < 256; i++)
    {
        setColor(0, i, 0);
        delay(4);
    }
    delay(500);           //turn the RGB LED green smoth
```

```
for (i=0; i < 256; i++)  
{  
    setColor(0, 0, i);  
    delay(4);  
}  
delay(100);           //turn the RGB LED blue smoth  
}
```

Experiment Result

Here you should see the RGB LED flashes colorfully, and blue first, then red, orange, yellow, green, blue, indigo and purple.

