

## Project 22: Light Lamp

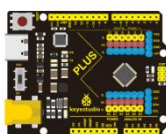


### 1. Project Introduction

A photocell is a resistor that changes resistance depending on the amount of light incident on it. A photocell operates on semiconductor photoconductivity: the energy of photons hitting the semiconductor frees electrons to flow, decreasing the resistance.

We use the characteristics of Photocell to make a light-controlled table lamp.

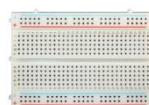
### Project Hardware



Plus









Plus Board



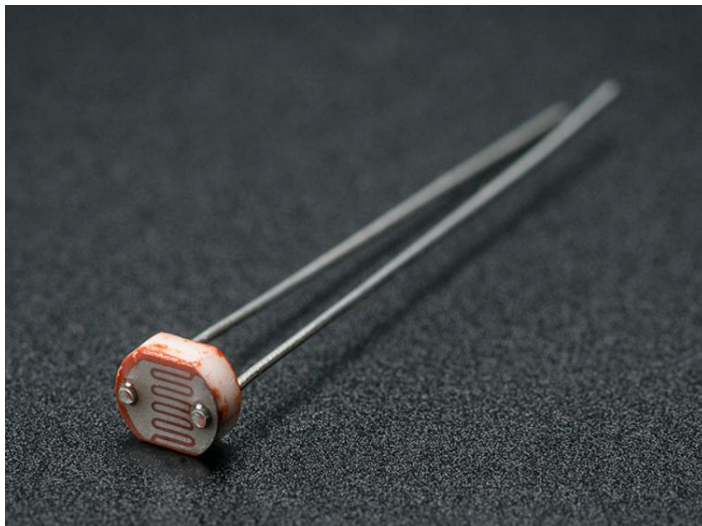
400-Hole



USB Cable\*1

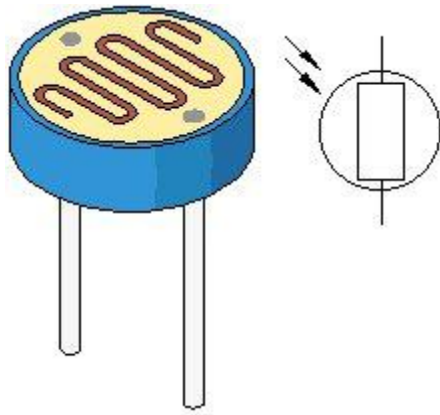
Development Board*1	Holder	Breadboard	
			
Photocell *1	Red M5 LED *1	220Ω Resistor*1	10KΩ Resistor*1
			
Jumper	Light Lamp		
Wire*6	Paper Card*1		

### 3. Photocell Little Knowledge



Photocell is commonly applied in the measurement of light, light control and photovoltaic conversion (convert the change of light into the change of electricity).

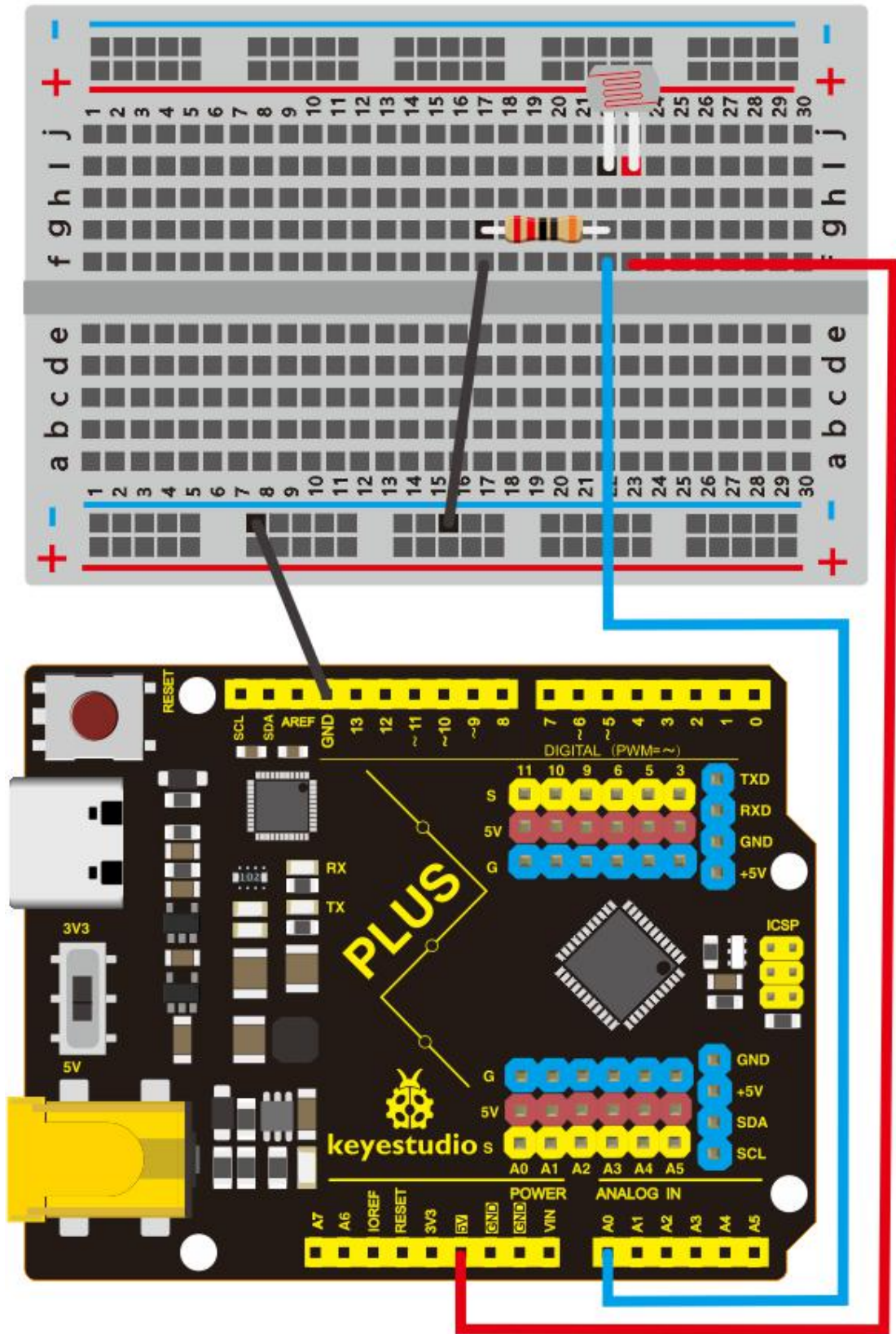
Photocell is also being widely applied to various light control circuit, such as light control and adjustment, optical switches, etc.



We will start with a relatively simple experiment regarding to photovaristor application.

#### **4.Read Photocell Value**

We first use a simple code to read the value of the photocell, print it in the serial monitor



/\*

keyestudio STEM Starter Kit

Project 22.1

Read Photocell value

<http://www.keyestudio.com>

\*/

```
int photocellpin=0;// initialize analog pin 0, connected with  
photocell
```

```
int val=0;// initialize variable va
```

```
void setup()
```

```
{
```

```
Serial.begin(9600);// set baud rate at "9600"
```

```
}
```

```
void loop()
```

```
{
```

```
val=analogRead(photocellpin);// read the value of the sensor  
and assign it to val
```

```
Serial.println(val);// display the value of val
```

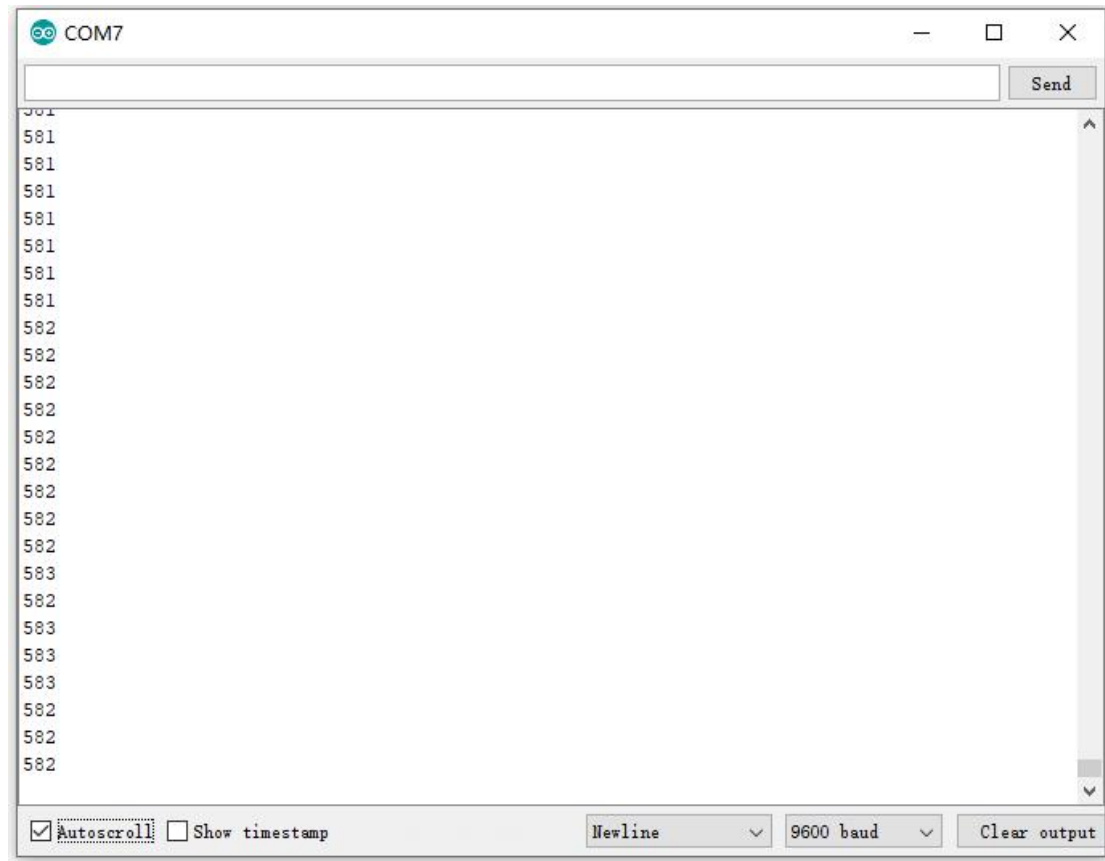
```
delay(1000);// wait for 1 s
```

```
}
```

```
////////////////////////////////////
```

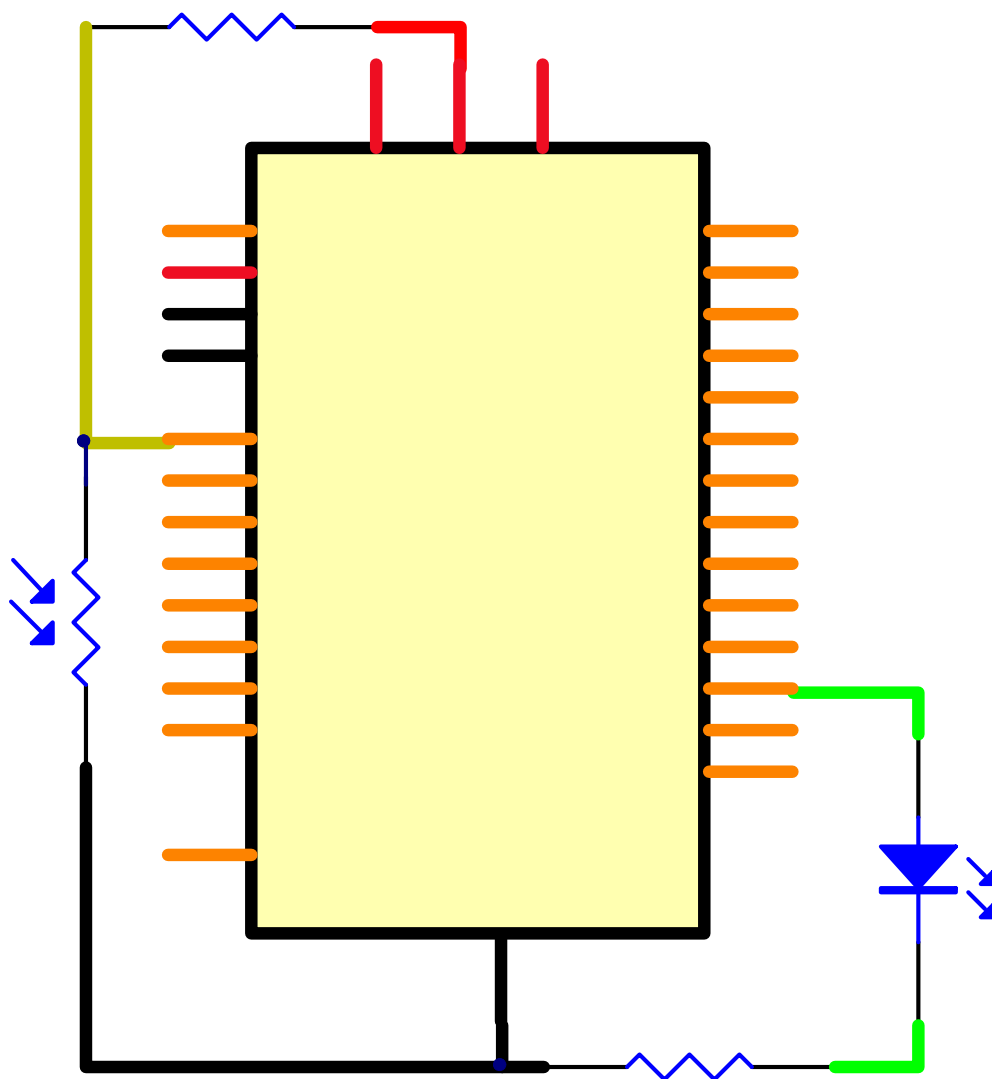
Upload the code to the Plus development board, open the serial monitor, and then you can read the value of photocell.

We put our hands on the photocell, and you will find that the value displayed on the serial monitor becomes greater.

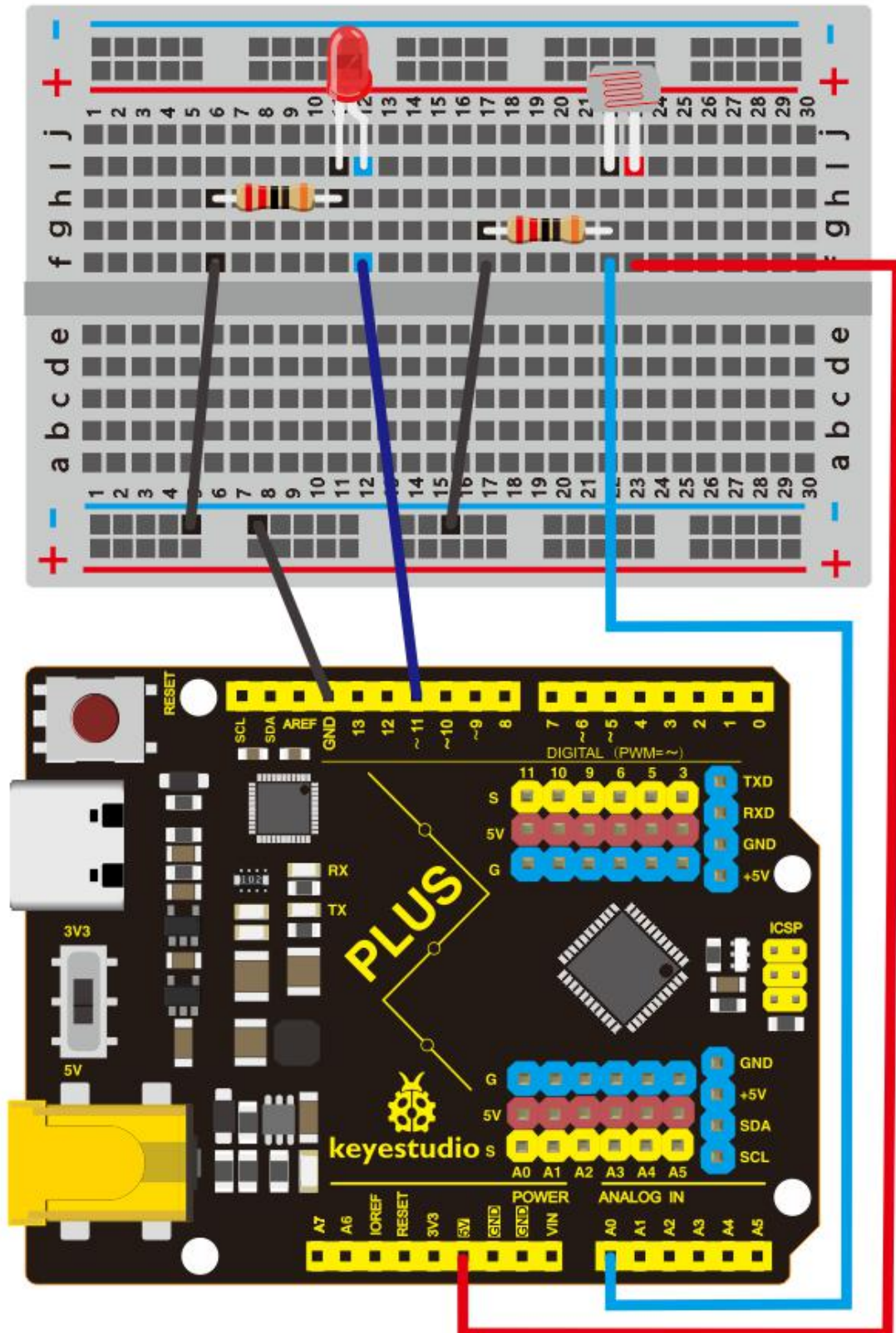


## 5.Light Lamp Circuit Connection

We made a small dimming table lamp, and now we are apt to make a light-controlled table lamp. Their principles of them are same. That is getting the analog value of the sensor through Arduino and then adjusting the brightness of the LED.







## 6. Project Code



```
/*  
keyestudio STEM Starter Kit  
Project 22.2  
Light Lamp  
http://www.keyestudio.com  
*/  
  
int photocellpin=0;// initialize analog pin 0, connected with  
photocell  
  
int ledpin=11;// initialize digital pin 11,  
int val=0;// initialize variable va  
  
void setup()  
{  
  pinMode(ledpin,OUTPUT);// set digital pin 11 as "output"  
  Serial.begin(9600);// set baud rate at "9600"  
}  
  
void loop()  
{  
  val=analogRead(photocellpin);// read the value of the sensor  
  and assign it to val  
  
  Serial.println(val);// display the value of val  
  
  analogWrite(ledpin,val/4);// set up brightness (maximum  
  value 255)
```

```
delay(10);// wait for 0.01s
```

```
}
```

```
////////////////////////////////////
```

## 7.Project Result

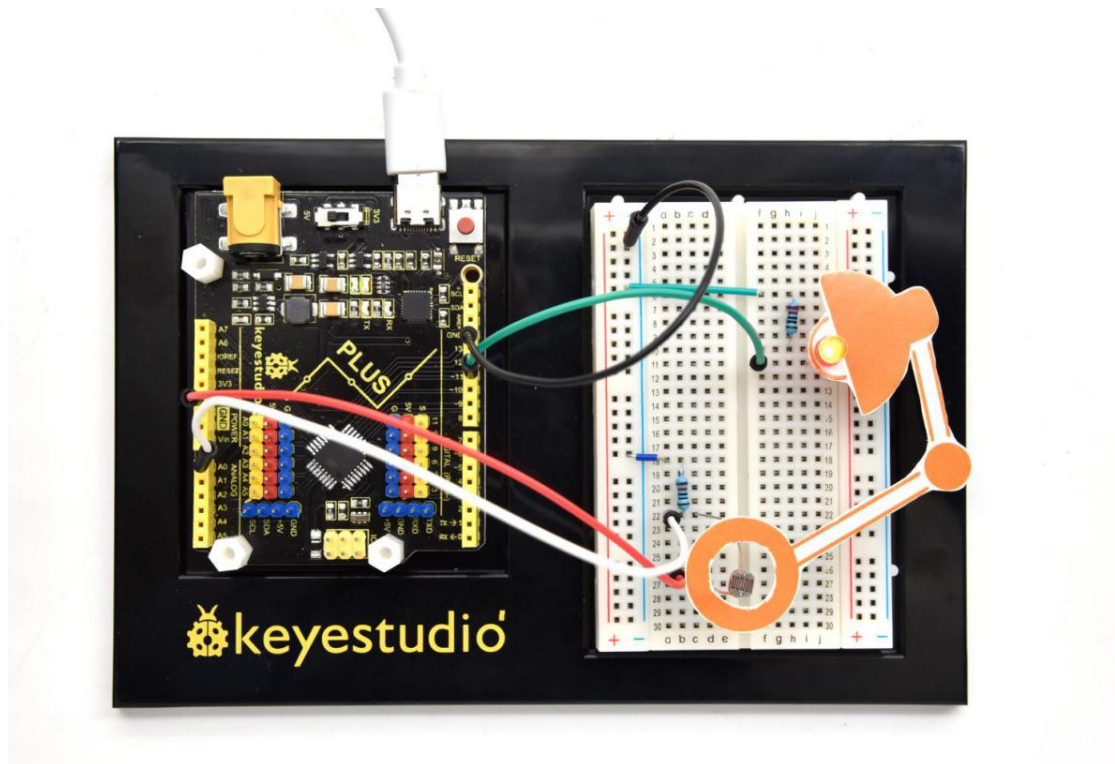
Hook up the components as follows.

Upload the code to the PLUS development board.

Open the serial monitor and set the baud rate to 9600. The monitor will display the current photocell value.

When we put our hands on the photocell, the value displayed on the serial monitor will become larger and LED will dim.

When we release our finger, the displayed value will become smaller and the LED will become brighter.



\*\*\*\*\*next

project\*\*\*\*\*