

## Photocell

### 1. Overview:

In this lesson, you will learn how to measure light intensity using an Analog Input. You will build on Lesson 18 and use the level of light to control the number of LEDs to be lit.

The photocell is at the bottom of the breadboard, where the pot was above.

### 2. Component Required:

- (1) x Uno R3
- (1) x 830 tie-points breadboard
- (8) x leds
- (8) x 220 ohm resistors
- (1) x 1k ohm resistor
- (1) x 74hc595 IC
- (1) x Photoresistor (Photocell)
- (16) x M-M wires (Male to Male jumper wires)



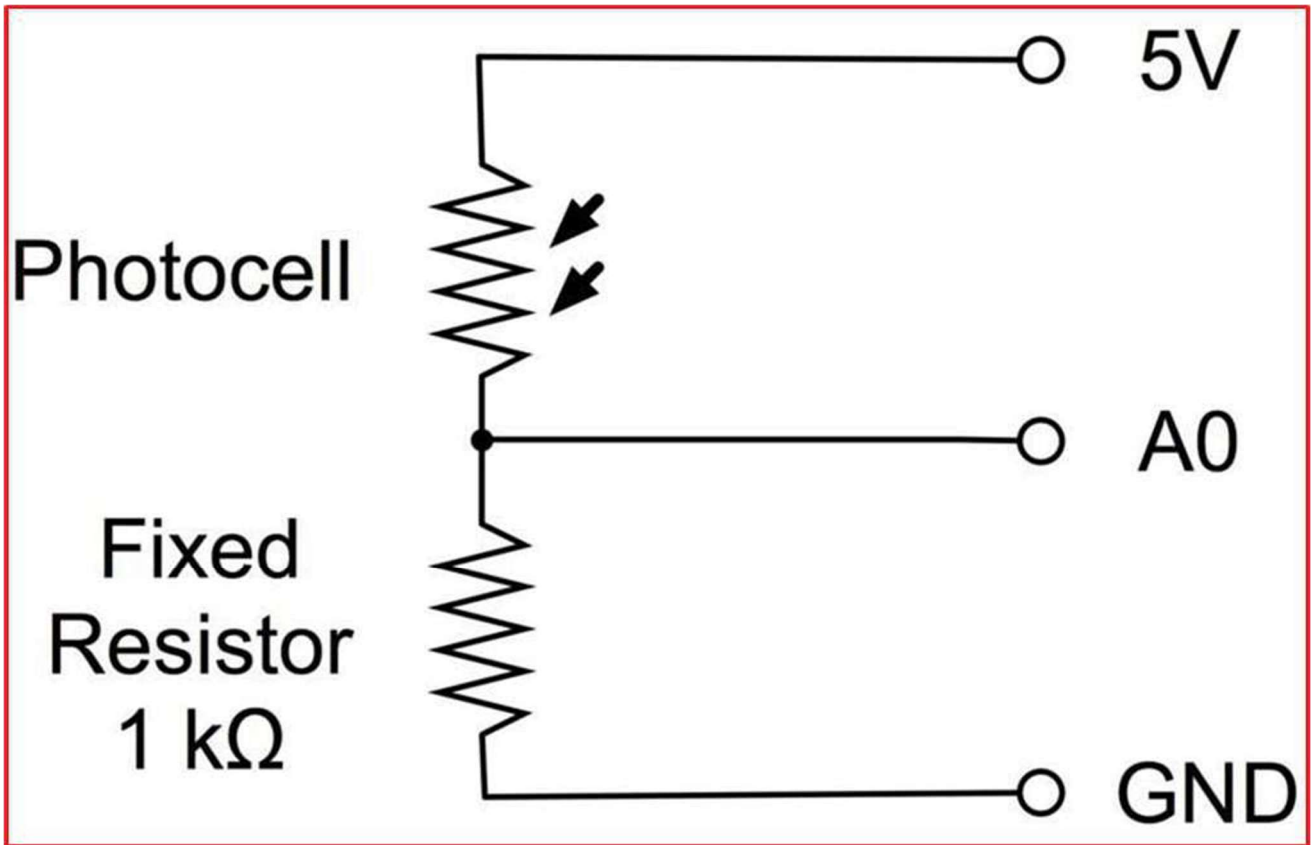
### 3. Component Introduction:

- **PHOTOCELL**

The photocell used is of a type called a light dependent resistor, sometimes called an LDR. As the name suggests, these components act just like a resistor, except that the resistance changes in response to how much light is falling on them.

This one has a resistance of about 50 k $\Omega$  in near darkness and 500  $\Omega$  in bright light. To convert this varying value of resistance into something we can measure on an UNO R3 board's analog input, it needs to be converted into a voltage.

The simplest way to do that is to combine it with a fixed resistor.

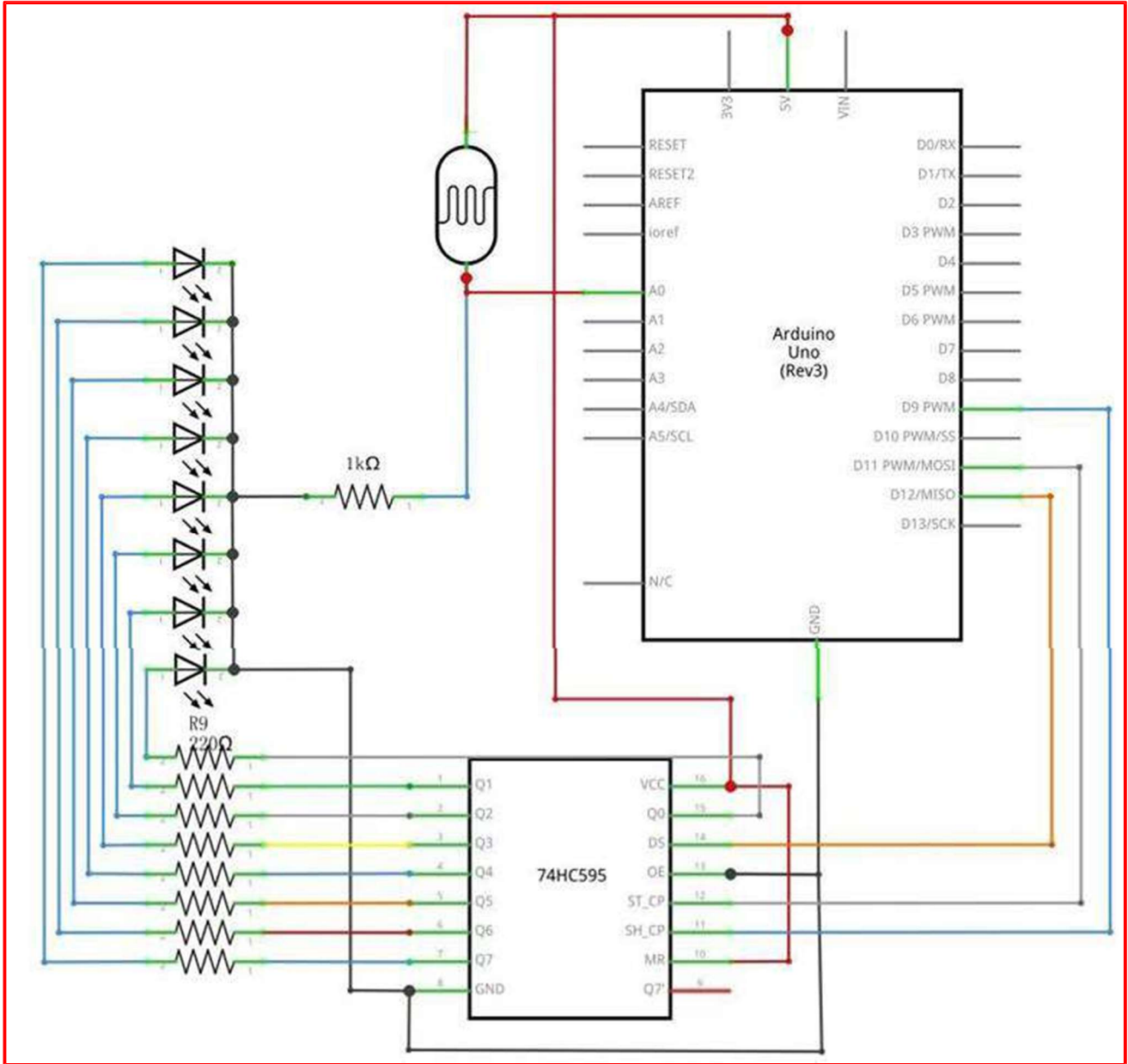


The resistor and photocell together behave like a pot. When the light is very bright, then the resistance of the photocell is very low compared with the fixed value resistor, and so it is as if the pot were turned to maximum.

When the photocell is in dull light, the resistance becomes greater than the fixed 1 kΩ resistor and it is as if the pot were being turned towards GND.

Load up the sketch given in the next section and try covering the photocell with your finger, and then holding it near a light source.

4. Connection:  
 • Schematic



5. Wiring Diagram:

