

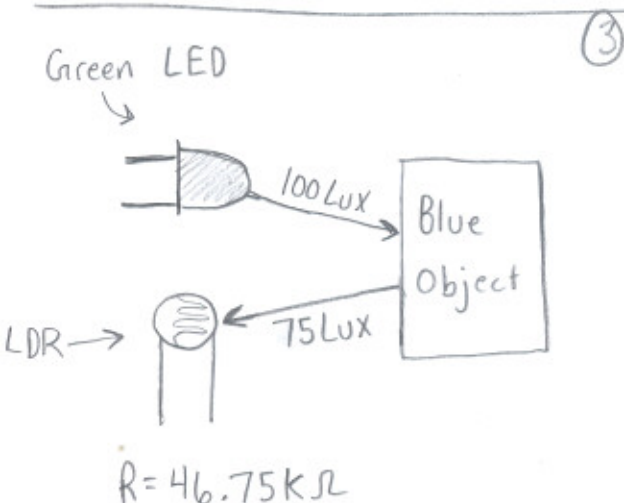
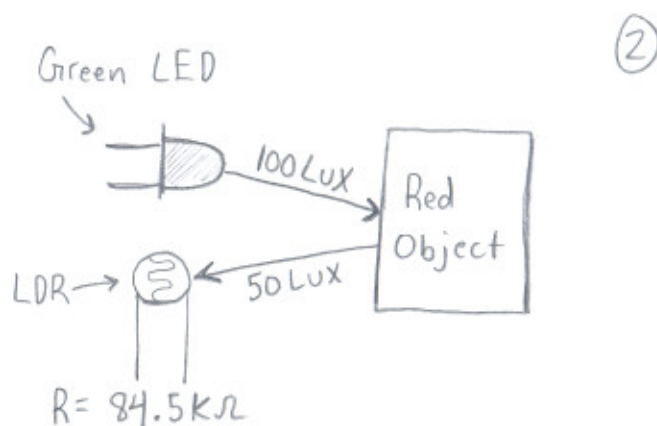
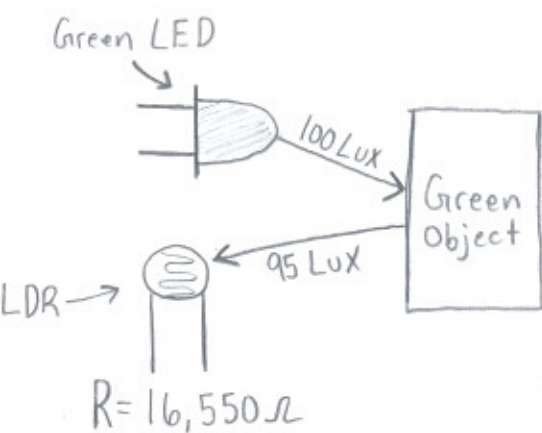
Radio Shack P201D-5R Photo-Resistor (LDR)

Rated:	Light Intensity	Resistance	Linear Approximation:	Intensity	Resistance
	1 Lux	160K Ω	$160 - 9 = 151$	75 Lux	46.75K Ω
	100 Lux	9K Ω	$\frac{151}{100} = 1.51K\Omega \downarrow / \text{Lux} \uparrow$	50 Lux	84.5 K Ω
				25 Lux	122.25 K Ω

Operating Principle: An object's color is determined by which wavelength of visible light is mostly reflected off its surface and is mostly not absorbed. i.e. A green object appears green because green light is almost entirely reflected, while light of other colors is absorbed.

Application: Detect objects of Red, Green, + Blue.

Example: Using Green (Applies to Red + Blue):



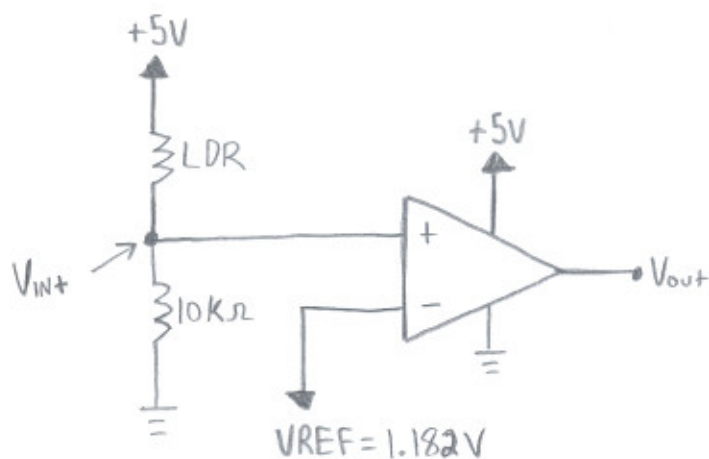
Therefore I need the output of the comparator high for LDR resistance values between 9K Ω and 20K Ω .

Equation of Line for approximation:

$$y = -1525.25x + 161525.25,$$

where y = Resistance Value

x = Lux Intensity



Determining LDR Resistance values that keep $V_{out} = 0V$

$$1.181V < 1.182V, \therefore$$

$$V_{IN+} = 1.181 = 5V \left(\frac{10k\Omega}{10k\Omega + LDR} \right) \Rightarrow LDR = 32,337\Omega$$

- $32,337\Omega$ corresponds to 85 Lux
- $V_{out} = 0$ for Light Intensities < 85 Lux
- @ 86 Lux, $LDR = 30,353.5\Omega$

$$V_{IN+} = 5V \left(\frac{10k\Omega}{10k\Omega + 30,353.5\Omega} \right) = 1.239V$$

$$1.239V > 1.182V, \text{ Therefore } V_{out} = 5V$$

MC=Micro-Controller

+5V

