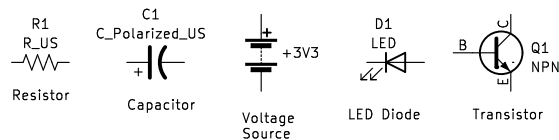


Basic Building Blocks



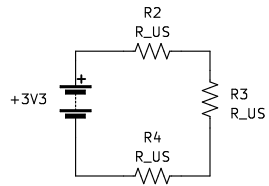
Goals:

1. Build & simulate circuit in TinkerCAD
2. Use multimeter to measure voltage, current, and resistance
3. Build circuit on breadboard

Instructions:

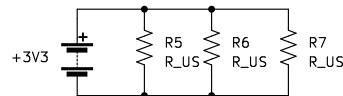
1. Use 3.3V and GND from Raft Board on Breadboard

Resistors in Series



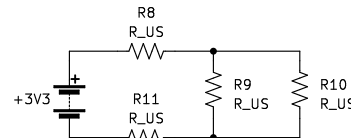
1. Find equivalent resistance
2. Find voltage drop across each resistor
3. Find current in loop

Resistors in Parallel



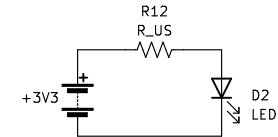
1. Find equivalent resistance
2. Find voltage drop across each resistor
3. Find current in each loop

More Fun with Resistors



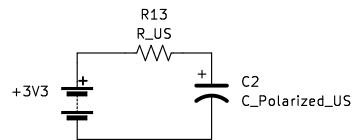
1. Find equivalent resistance
2. Find voltage drop across each resistor
3. Find current in each loop

LED with Resistor



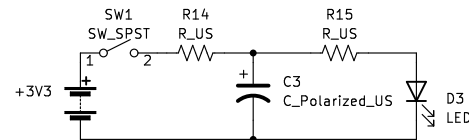
1. Find required resistance
2. How does color of LED change circuit?

RC Circuit



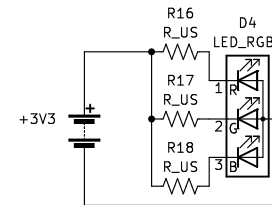
1. Measure voltage across capacitor
2. Turn on/off power supply to see how voltage changes
3. How does changing R and C values impact timing?

Capacitor discharges thru LED



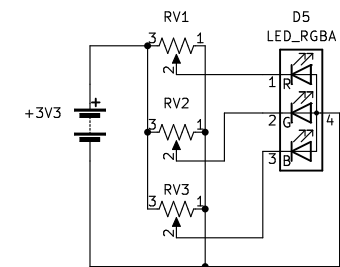
1. Use switch to charge capacitor
2. Watch LED as capacitor discharges

RGB LED with 3 Resistors



1. How does changing resistance change the output color?

RGB LED with Potentiometers



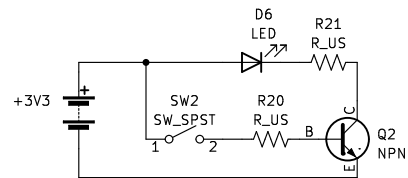
1. How does changing resistance change the output color?

Photoresistor



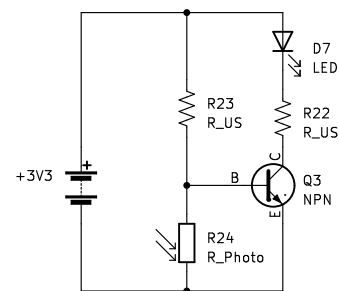
1. Measure voltage across photoresistor as light changes

Transistor drives LED



1. What happens when flip switch?

Dark Detector



1. Create voltage divider with photoresistor
2. Drive transistor with output voltage of divider
3. When does led turn on?
4. How would you build a light detector?

Made by Jeannette:)

Robotics Crash Course ~ Summer STEM

Sheet:

File: rcc-hardwarecrashcourse.kicad_sch

Title: Hardware Crash Course

Size: USLetter Date: 2023-08-01

KiCad E.D.A. kicad 7.0.1-0

Rev: 0.1

Id: 1/1