Open Design & Technology

Empowering Designers to Embrace Technology

Week 1 Recap


Group
Formation

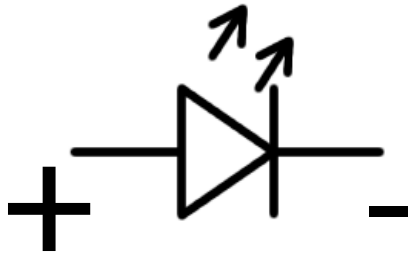
Managing the “KIT”

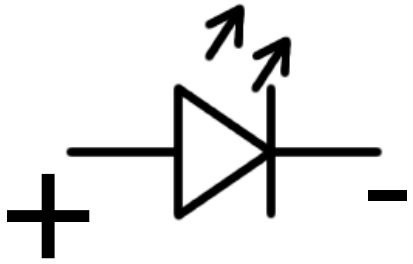
- All parts are tested to be functional
- Entire semester – Take home (optional)
- Your responsibility | Replace

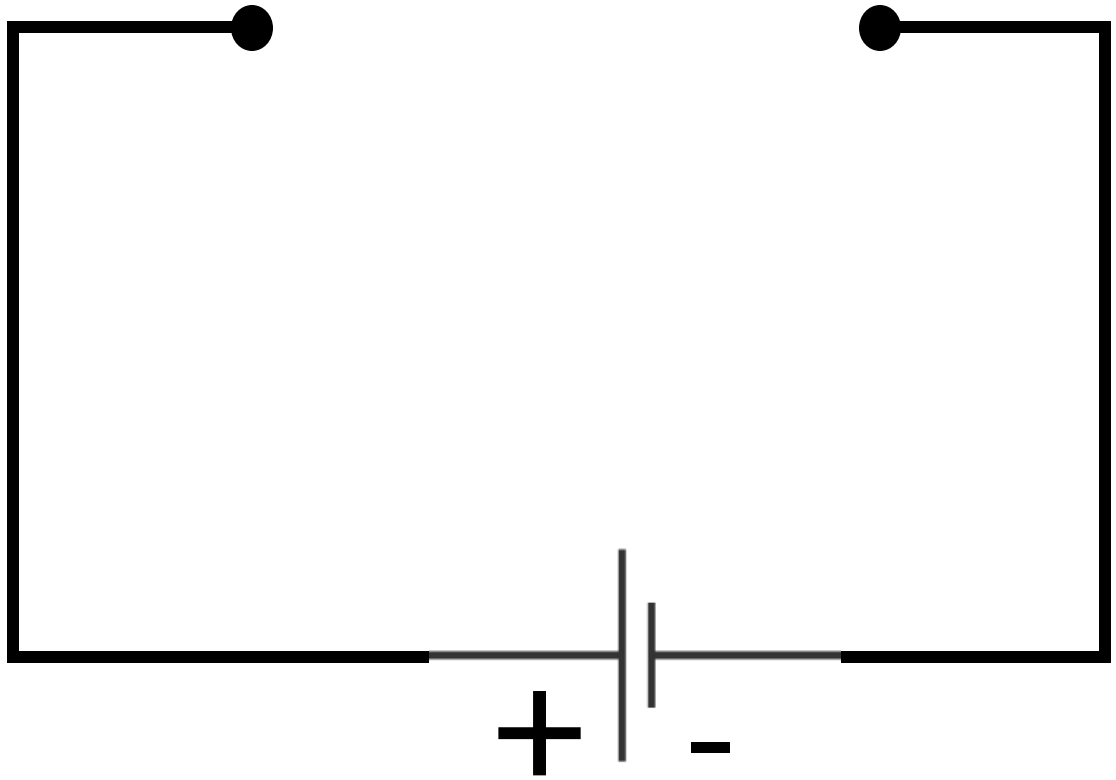
Adventure Begins!

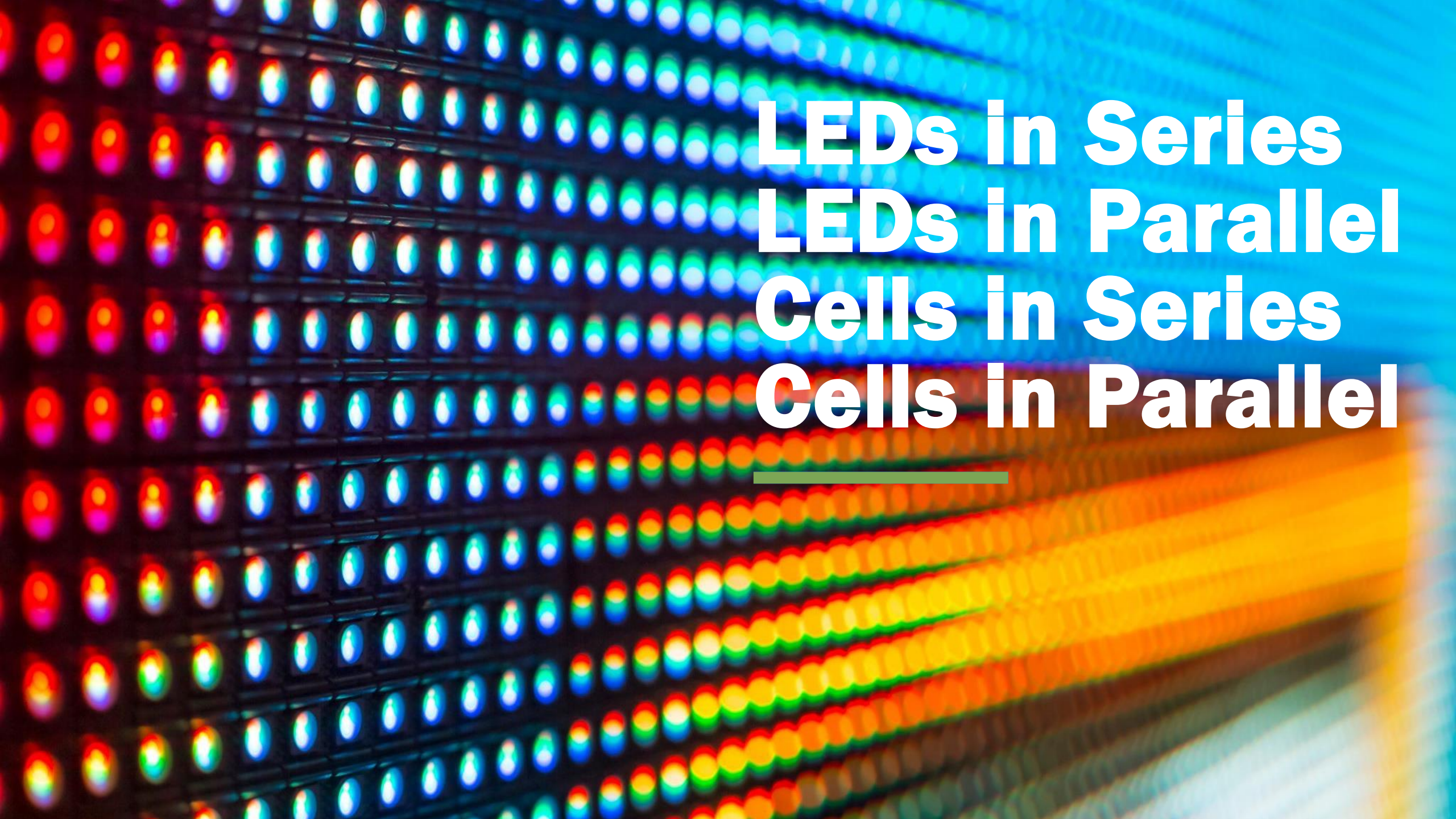
Make the LED glow!

Polarity Closed Loop

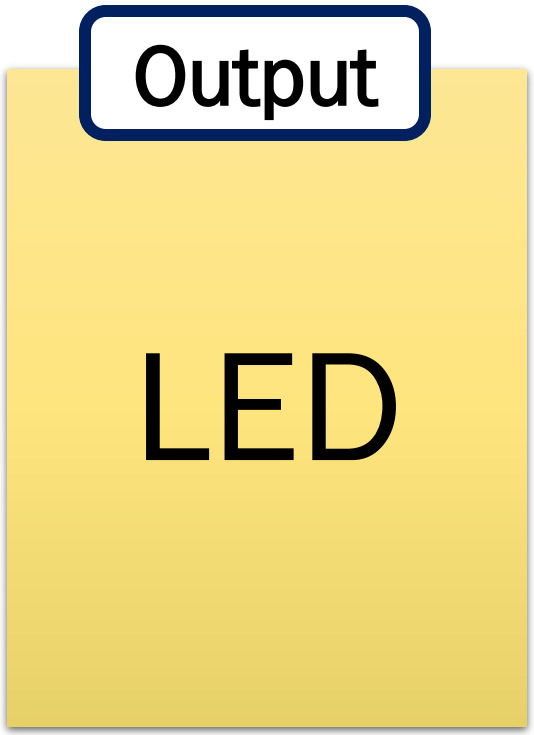


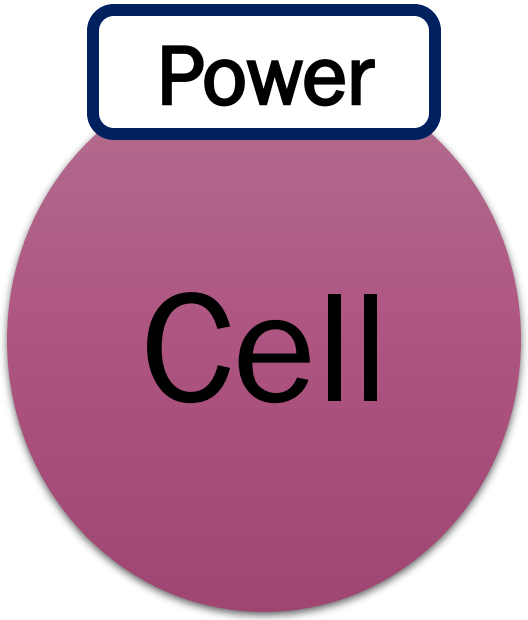




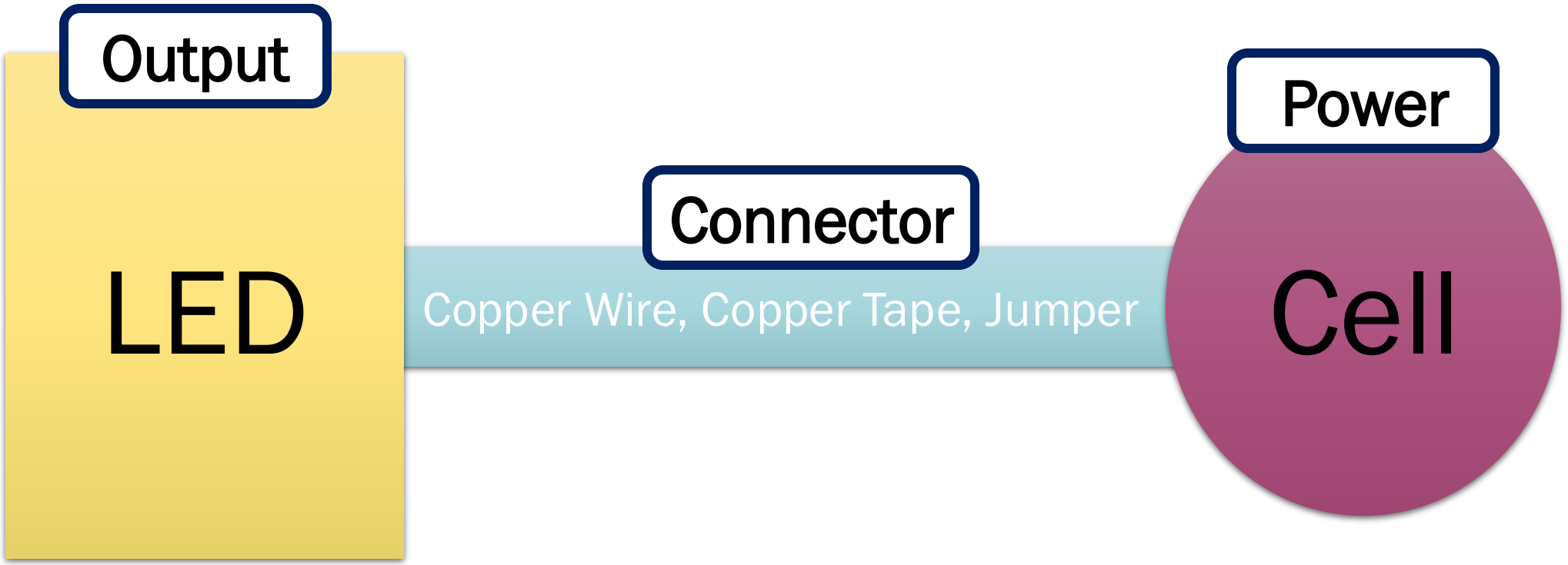

LEDs in Series
LEDs in Parallel
Cells in Series
Cells in Parallel

Element's Role in the circuit (Function)





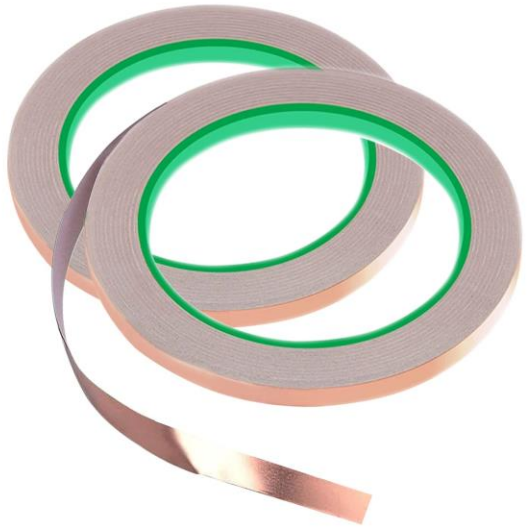
Element's Role in the circuit (Function)



Your first diagram of a circuit / Activity

Major Components

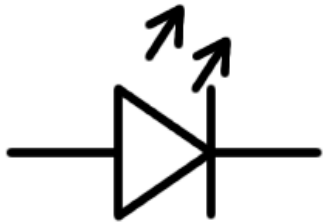
Copper Tape



*Bottom region/Pasting region – non conducting

Micro Lithium Cell

LED



Buzzer

Reed Switch

3 switches | 3 LEDs

Problem

Configuration 1 : Control 3 LEDs independently
(On/Off of 1 LED does not affect any other LED)

Mandatory to use all the three switches

3 switches | 3 LEDs

Problem

Configuration 1 : Control 3 LEDs independently (On/Off of 1 LED does not affect any other LED)

Configuration 2 : 3 LEDs are dependent on each other(All three On/Off at the same time)

Mandatory to use all the three switches

3 switches | 3 LEDs

Problem

Configuration 1 : Control 3 LEDs independently (On/Off of 1 LED does not affect any other LED)

Configuration 2 : 3 LEDs are dependent on each other(All three On/Off at the same time)

Configuration 3 : Configuration 1 + Configuration 2 + One LED which is always ON!

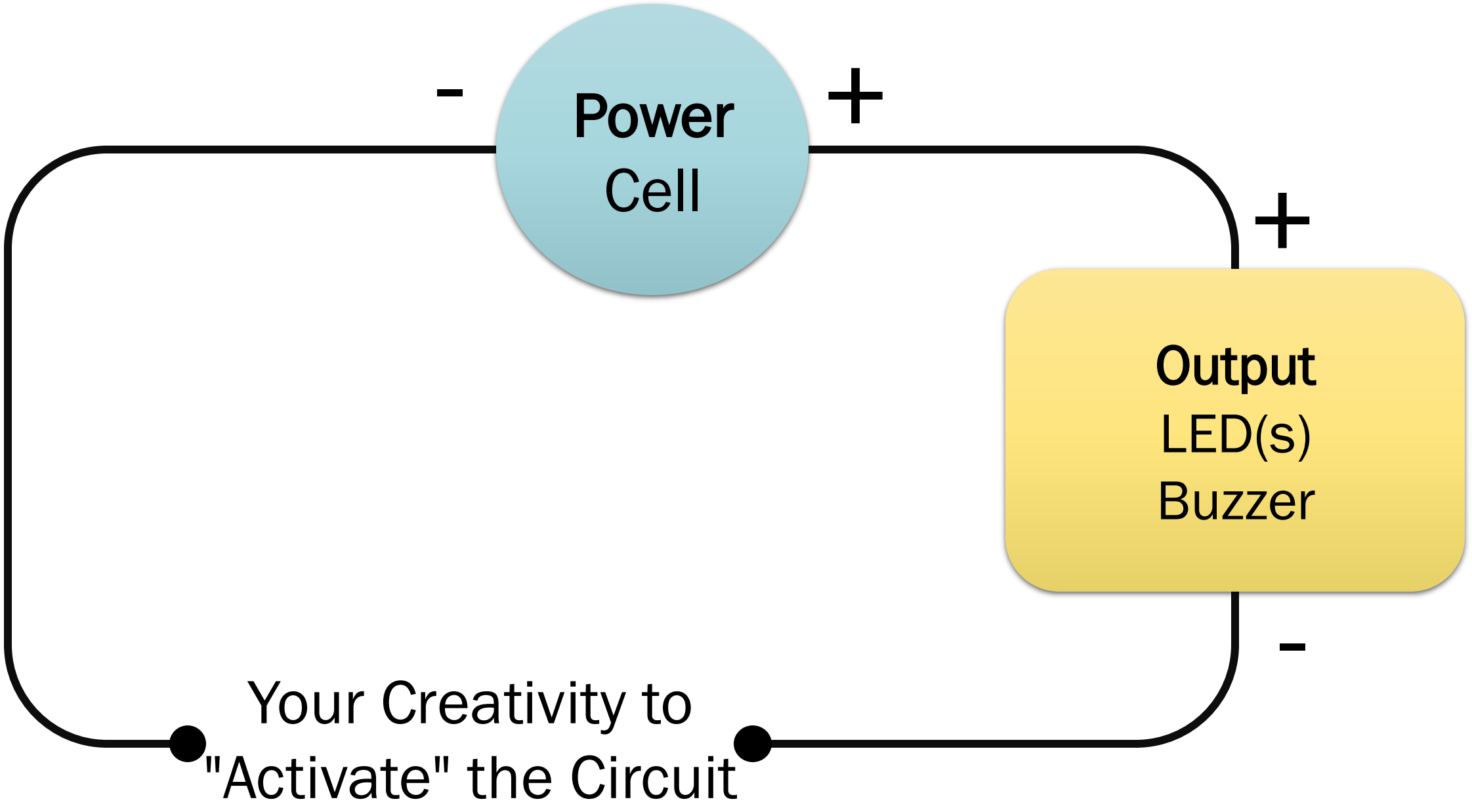
Mandatory to use all the three switches

Connectors
Copper Tape
Copper Wire
Jumpers

Power
Cell

Control
Reed Switch
Activate/Deactivate

Output
LED(s)
Buzzer


-
Power
Cell
+
+
Output
LED(s)
Buzzer
-
Your Creativity to
"Activate" the Circuit

First Mini-Project

A person should interact with circuit to activate the output(s)

Any action should activate the output(s)

GitHub Documentation

Basic Ideas

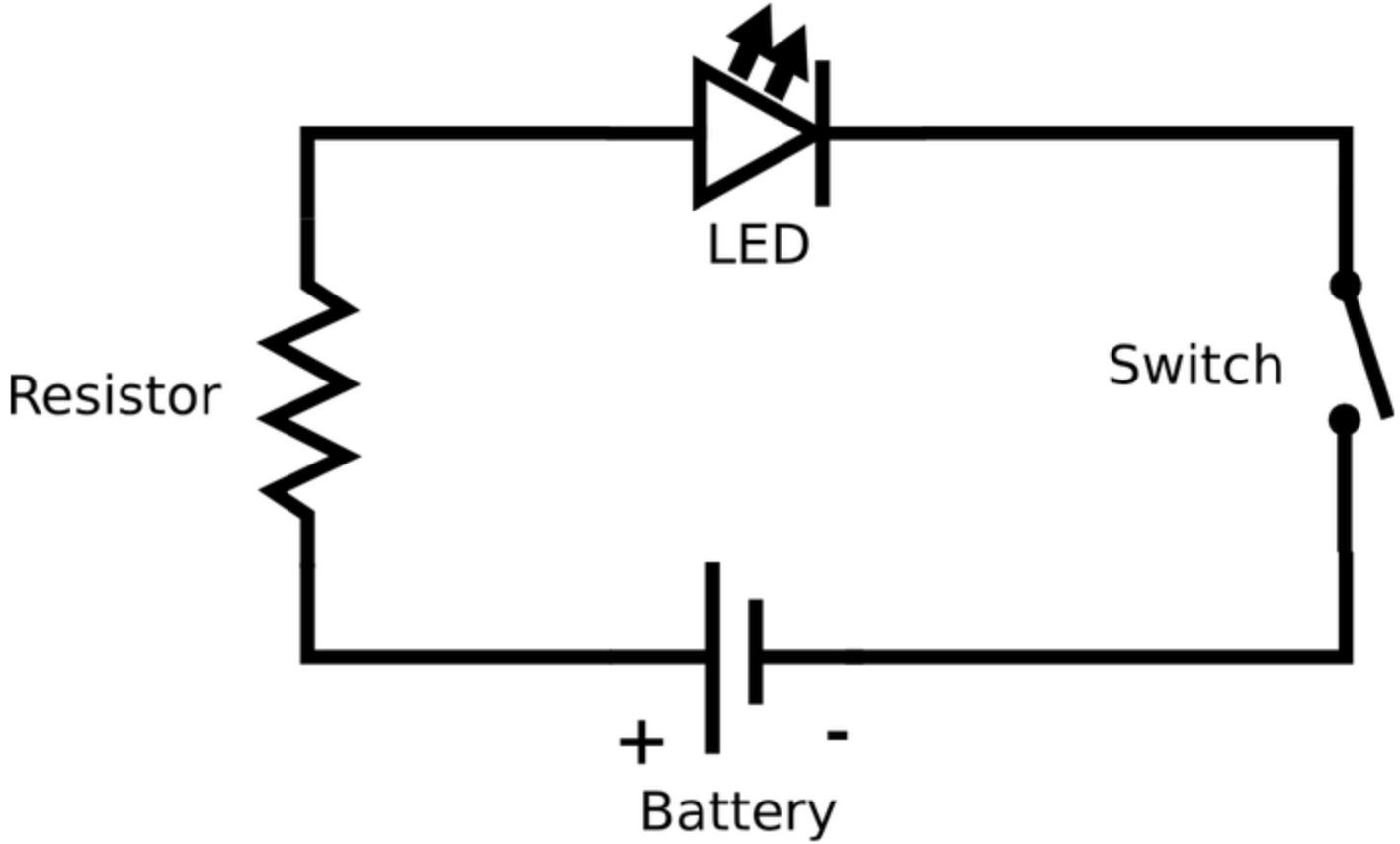
A greeting or information card that **reveals a hidden light or sound** only when a magnet is brought near

A simple alarm that activates when a door, box, or drawer is opened.

A box that gives feedback only when opened in the “correct way.”

Debugging

Basic Circuit - Sketch (Approach)



Breadboard

Switches / Push Buttons

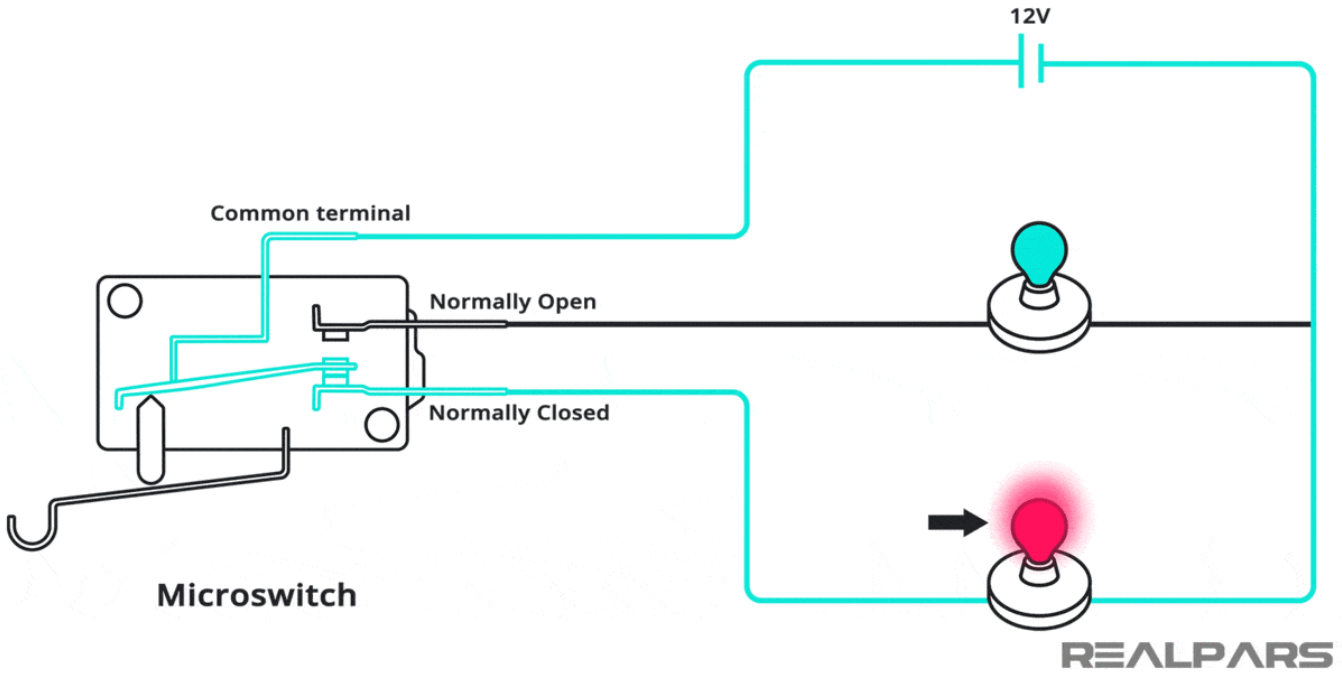
Limit Switch

Reed Switch

Push Button

Switches / Push Buttons

Limit Switch



Concepts

- ✓ LED – Series | Parallel
- ✓ Cell – Series | Parallel
- ✓ Circuit Diagram
- ✓ Reed Switch
- ✓ Buzzer
- ✓ Limit Switch

Need for a computing Element

Software & Hardware

Microcontroller / Microprocessor Module

Arduino Uno, Nano ...

ESPs ESP32...

ATTiny85

STM32

And Many more...

Programming Language

C++

C

Python

Java

And Many more...

IDE

Arduino IDE

Thonny

MuEditor

Microsoft Visual Studio

And Many more...

Thonny Installation