

# **Open Design & Technology**

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Empowering Designers to Embrace Technology

# Week 1 Recap





# Group Formation

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# Managing the “KIT”

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



Adventure Begins!



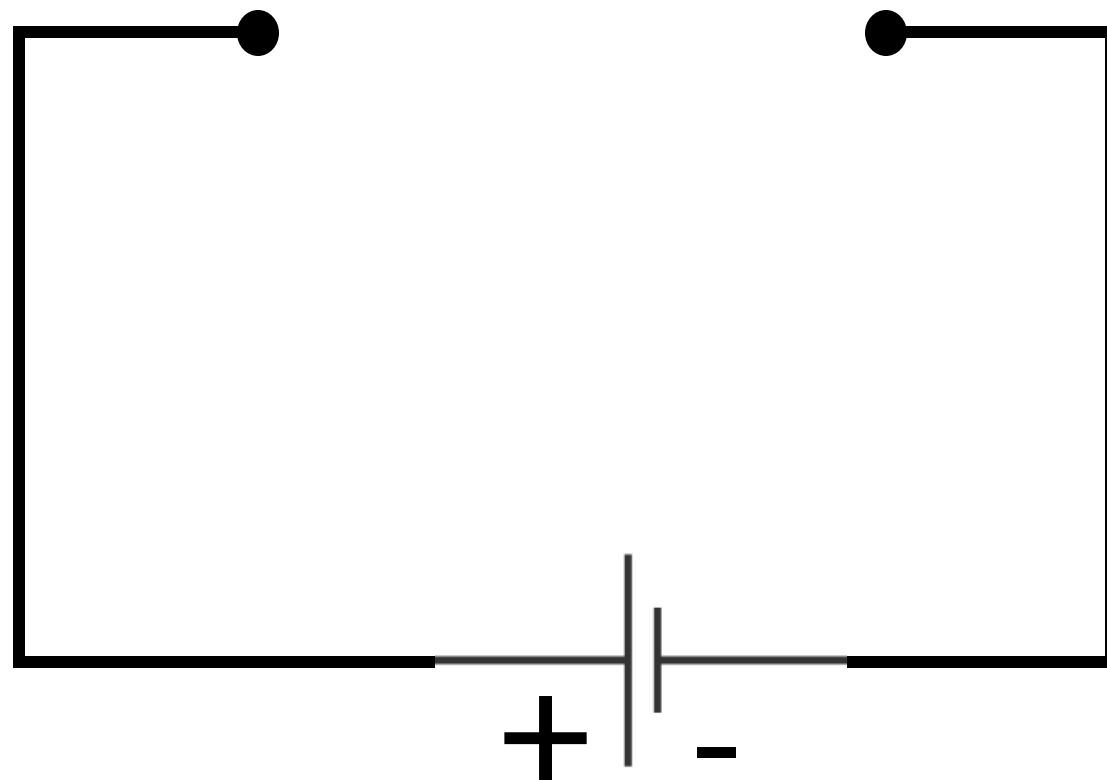
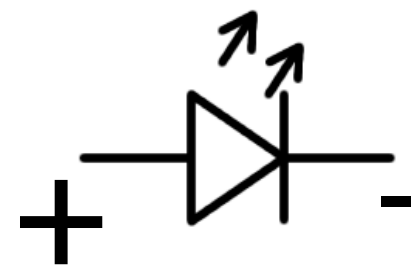
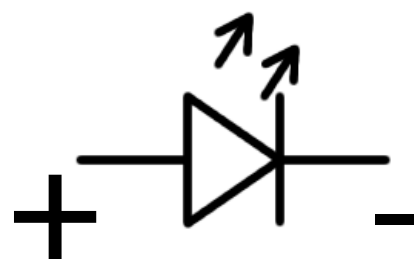
**Make the LED glow!**

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The background features a dark blue, almost black, space filled with intricate, glowing blue patterns. These patterns consist of numerous thin, curved lines that swirl and flow across the frame, creating a sense of dynamic movement. Interspersed among these lines are many small, bright blue dots or particles, some of which appear to be part of the swirling structures. The overall effect is reminiscent of a complex, high-tech or scientific visualization, such as a data visualization or a representation of a physical phenomenon like fluid dynamics or electromagnetic fields.

# **Polarity Closed Loop**

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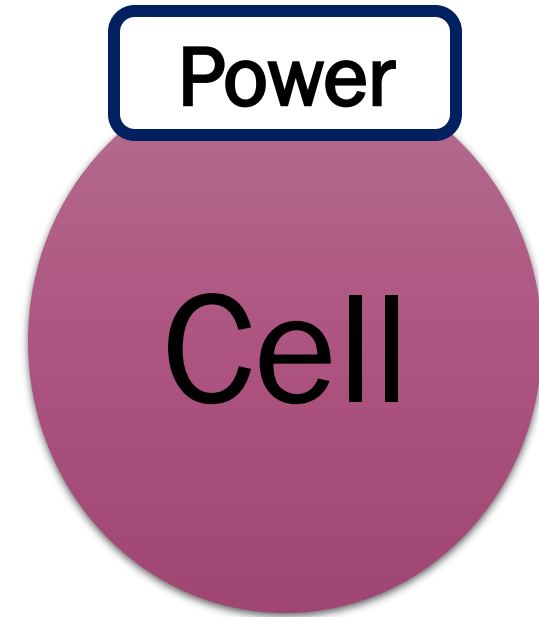
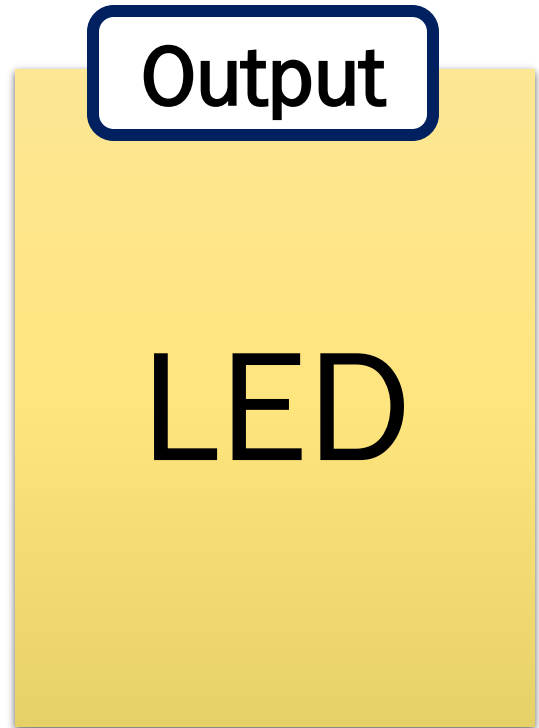
**LEDs in Series**  
**LEDs in Parallel**  
**Cells in Series**  
**Cells in Parallel**

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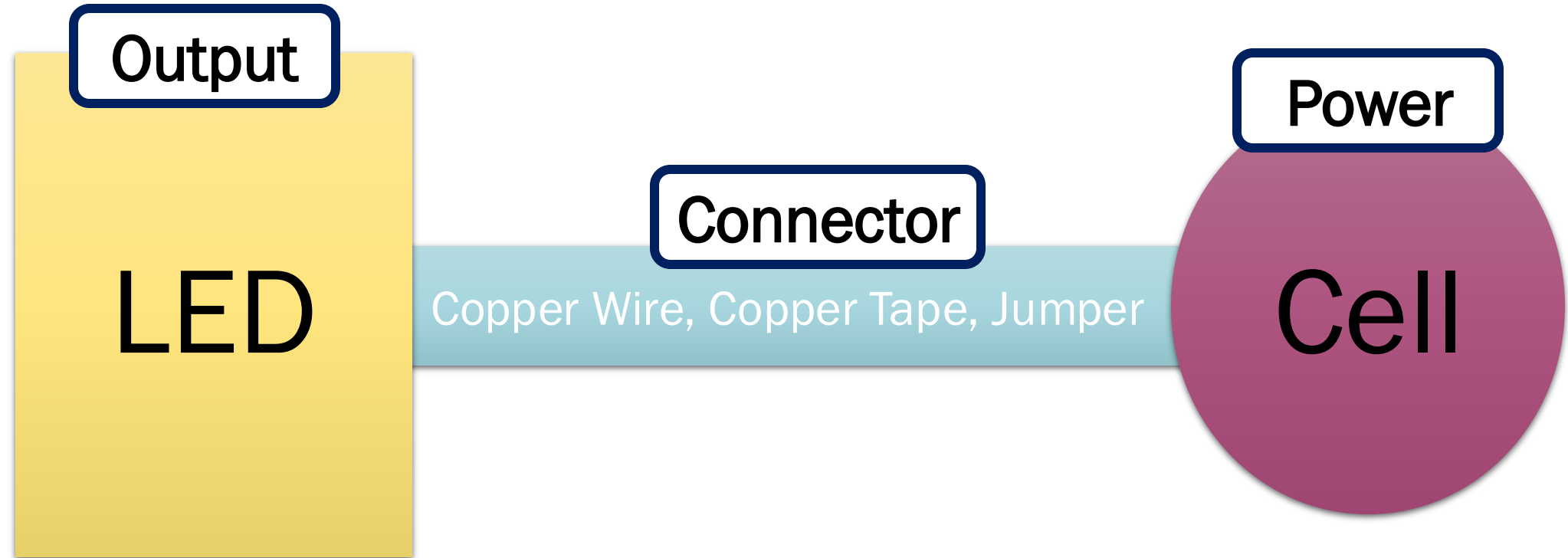
# Element's Role in the circuit (Function)

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# Element's Role in the circuit (Function)

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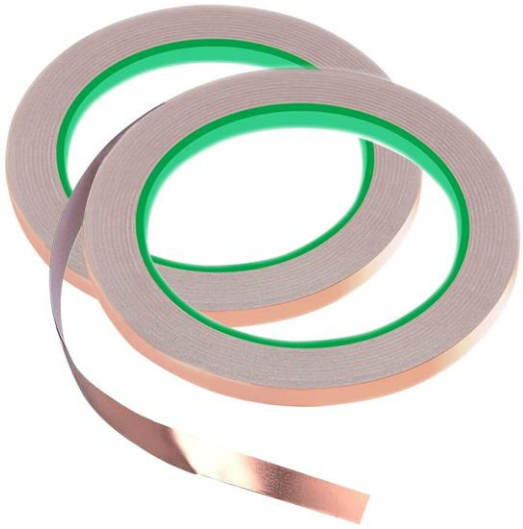


# **Your first diagram of a circuit / Activity**

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# Major Components

Copper Tape

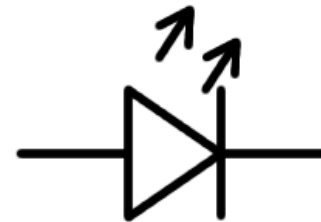


\*Bottom region/Pasting region – non conducting

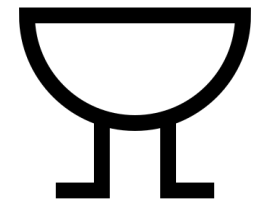
Micro Lithium Cell



LED

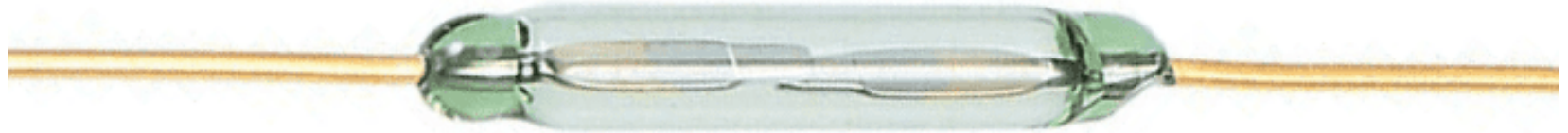


Buzzer



# Reed Switch

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3 switches | 3 LEDs

# Problem

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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

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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

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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**

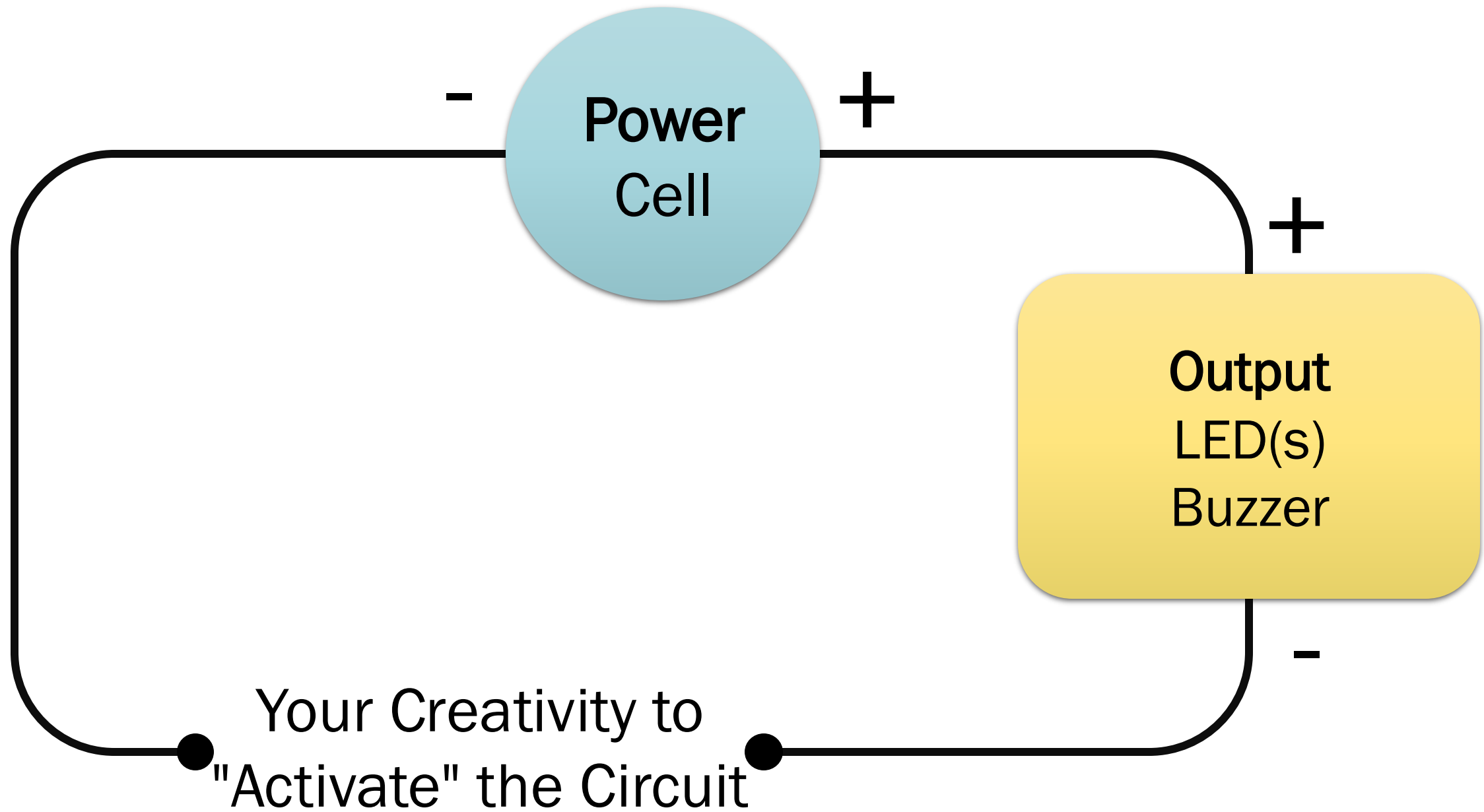
Reed Switch

Activate/Deactivate

## **Output**

LED(s)

Buzzer





# First Mini-Project

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

Any action should activate the output(s)

GitHub Documentation

# Basic Ideas

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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.”

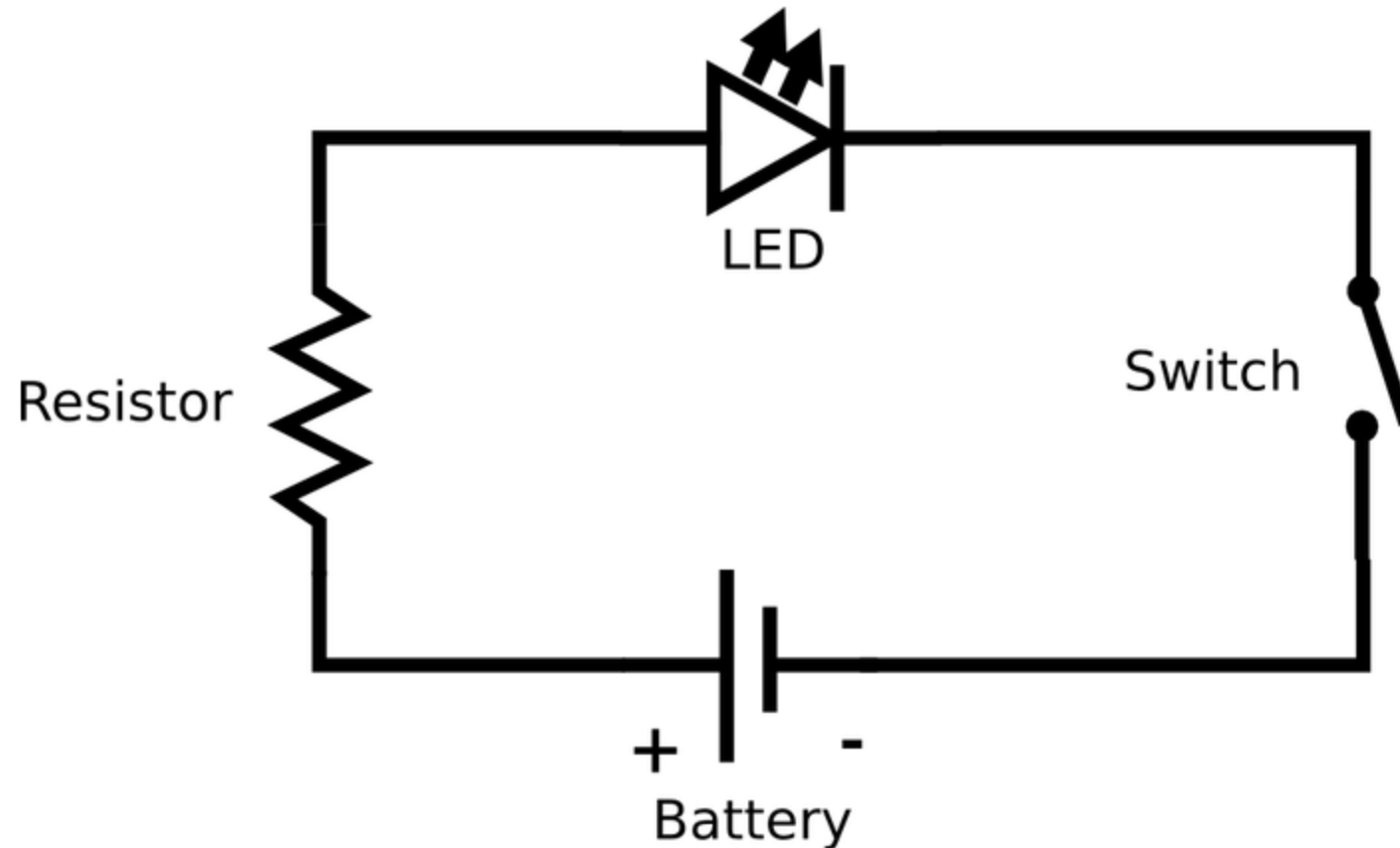


# **Debugging**

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# Basic Circuit - Sketch (Approach)

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# Breadboard

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# Switches / Push Buttons

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Limit Switch



Reed Switch

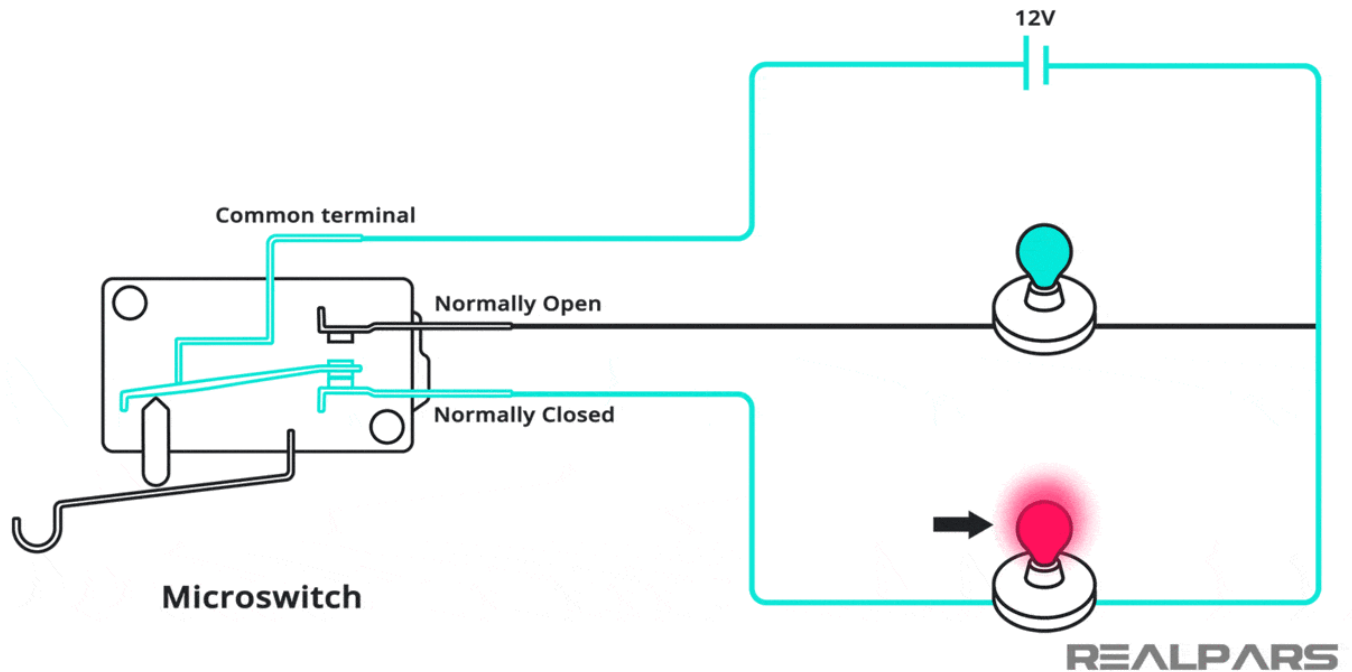


Push Button



# Switches / Push Buttons

## Limit Switch



# Concepts

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



# **Need for a computing Element**

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# Software & Hardware

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## 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**

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