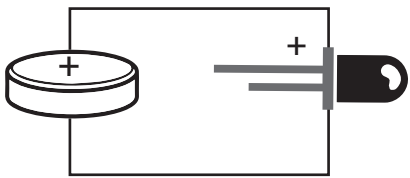
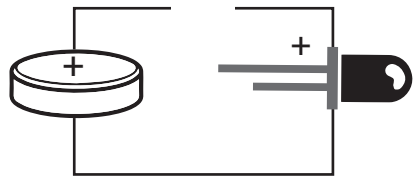
What is a circuit?

A circuit is a loop made up of different components that allows electricity to flow.

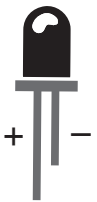
A circuits must be *a closed loop* in order for it to work.





What is an LED?

An LED is short for Light Emitting Diode. LEDs are **polarized** which means that they have a **positive** side and **negative** side. Usually, the longer leg is positive.



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Simple Circuits

Simple circuits require 3 things:

1. something that can provide energy (like a battery)

2. something **conductive** which allows the energy to flow (like a paper clip)

3. an **output** that does something with the energy (like an **LED**)

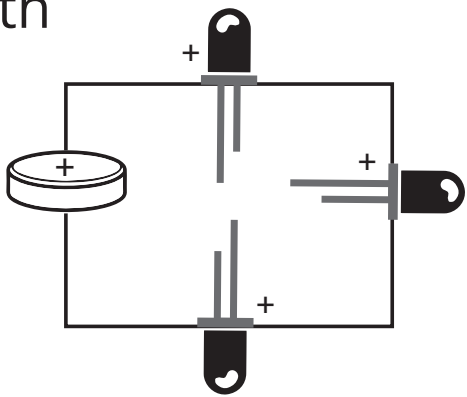
Conductors and Insulators

Certain materials such as copper and metals are **conductors**, they allow current to flow freely.

Insulators resist the flow of current. Glass or plastic are examples of insulators.

Circuits in series

A series circuit means that the components are connected along a single path



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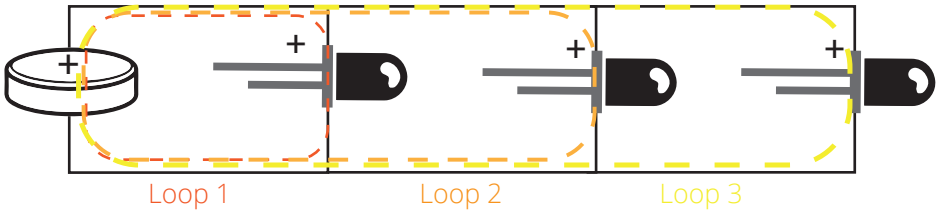
Circuits in parallel

In a parallel circuit, each component is wired back to the battery in its own loop.



Logic (AND/OR)

Logic allow you to add complexity to input and outputs. Start with a statement and decide if it is TRUE or FALSE. Add another statement using AND or OR. Decide whether the second statement is TRUE or FALSE.

For AND, both need to be TRUE

For OR, one or both need to be TRUE

Complex Circuits

Adding more components to your circuit gives you more control of the current. For example, an on/off switch can control when you want to have your lamp on.

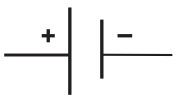
Inputs/Outputs

Inputs detect some sort of energy and processes it

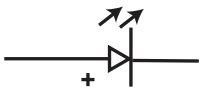
Outputs convert the energy into a different kind of energy

Circuit Diagrams

Reading a circuit diagram is like learning a new language



Battery



LED

Switch