Intro to Circuits



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Series Circuits

Most of the circuits we've done so far are called **series** circuits. This means all the components are chained together in a single loop of wires.



BRONZE Challenge:

- 1. Recreate this circuit in TinkerCAD:
- 2. What is the current in this circuit?
- 3. What voltage does each LED use?





Parallel Circuits

Here is an example of a **parallel** circuit:





Parallel Circuits

And in real life:

Note: Voltmeters are connected in parallel in the same way.





Series Vs Parallel Circuits

Below are examples of both circuits which include a broken lightbulb.





Note: Components in parallel will continue to work even if others are broken



SILVER Challenge:

- 1. Recreate this circuit in TinkerCAD:
- 2. What voltage does each LED use?





New Component: Slide Switch





GOLD Challenge:

- 1. Design a circuit in TinkerCad which has 3 LEDS, each in **parallel**, powered by a 9V battery. Then add a slide switch so as 1 LED is always on whilst the other 2 are controlled by the slide switch.
- 2. What is the voltage through each LED when they are all on?
- 3. Open the switch (turn it off) and measure the voltage used by the lit LED.



RGB LED: Circuit Diagram Symbol



Reminder: Cathodes connect to the negative side of the battery



Extension Challenge:

1. Recreate this circuit in TinkerCAD to produce a green light.

2. Can you change the circuit so the RGB LED lights up yellow?



Hint: You'll need to move the resistor



Extension Challenge:

 Produce a circuit diagram for this TinkerCAD circuit. Please do this by hand and send a photo of your drawing to <u>crastaff@aber.ac.uk</u>

Hints: 1. Use a pencil!2. Pay attention to the switch positions





Thank You

