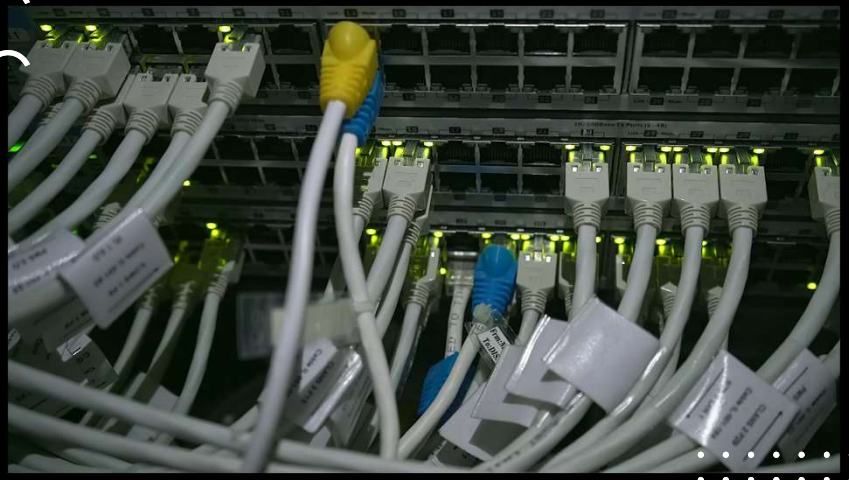
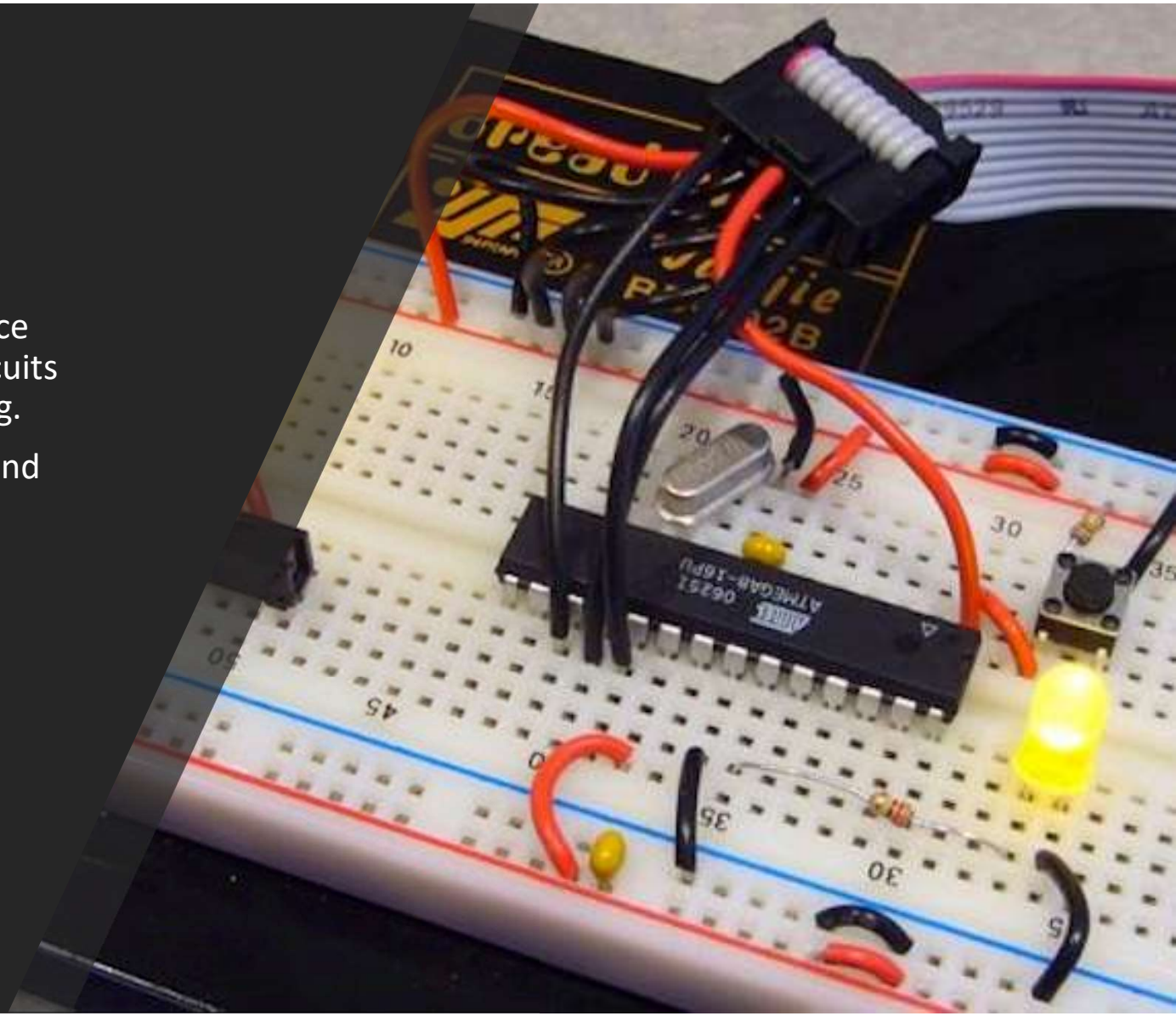
Electronics and Basic Connections!

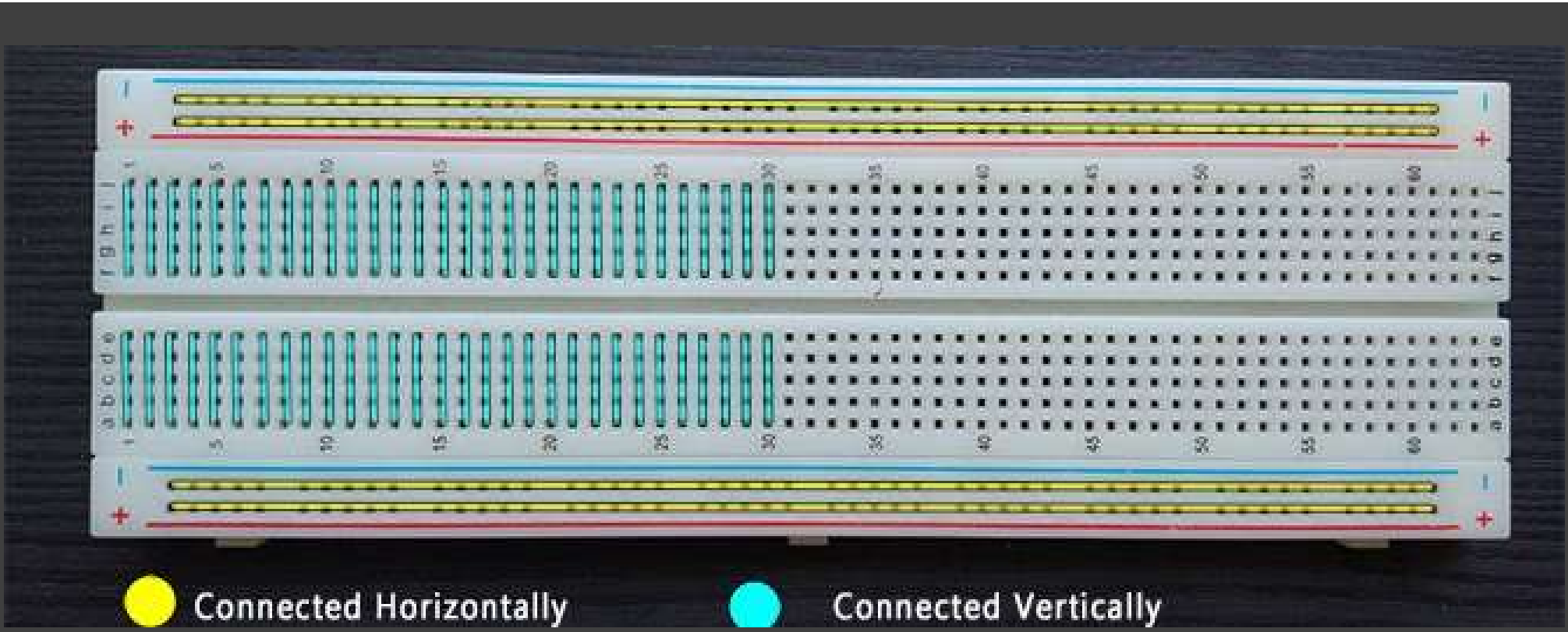
By: Joe Ambery



What is a breadboard?

- A breadboard is a simple device designed to let you create circuits without the need for soldering.
- They are helpful for building and testing circuits quickly before finalizing any circuit design.





How do they work?

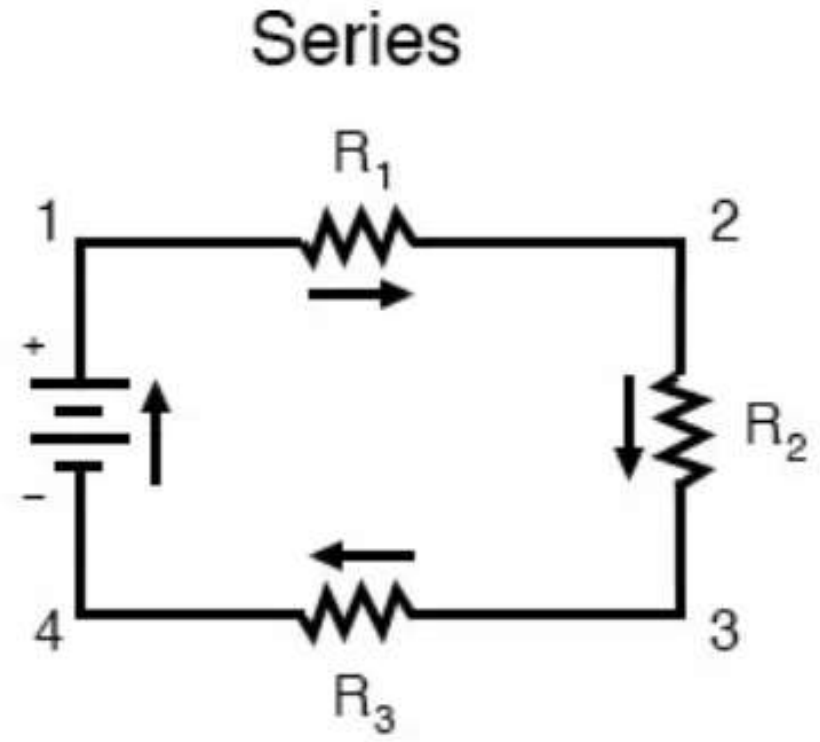
- In every breadboard you will find little holes called sockets.
- There are typically two outer sections and two inner sections of the breadboard.
- The outer sections are used exclusively for power. These are connected horizontally.
- The two inner sections are used for connecting components of your circuit. They are broken into rows of 5 sockets. These are connected vertically.

Breadboarding Components

- Battery (power source)
- Wires - red for positive and black for ground
- Pliers – used for stripping wires
- Resistors – measured in Ohms
- LEDs – long head to positive and short heads to ground

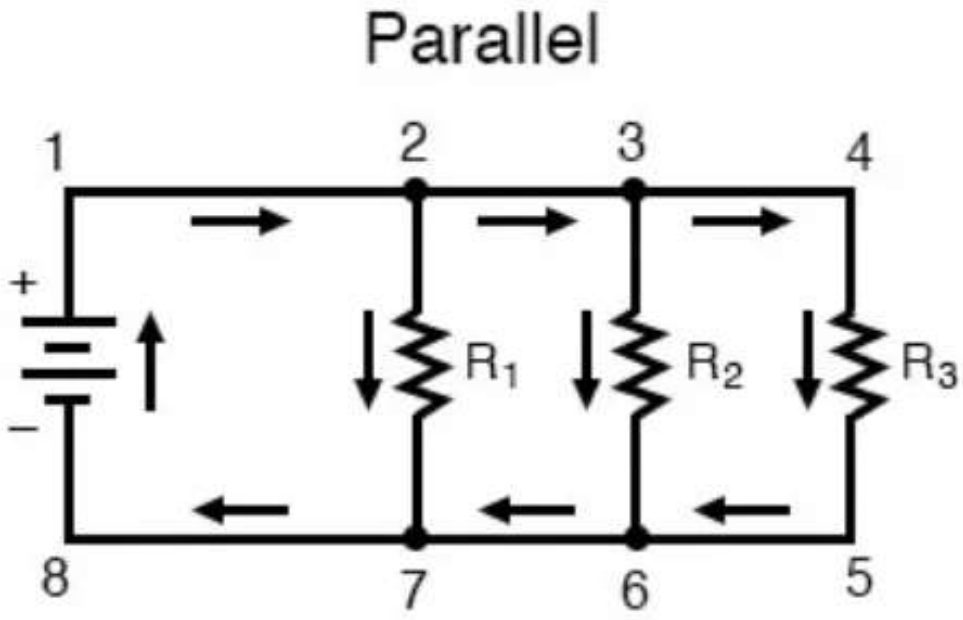
Series Circuit

- A series circuit comprises a path along which the whole current flows through each component.
- There is only one path for current to flow in a series circuit.
- In this example circuit, current flows from the battery in a clockwise direction. It passes through each component of the circuit (R1, R2, R3).



Parallel Circuit

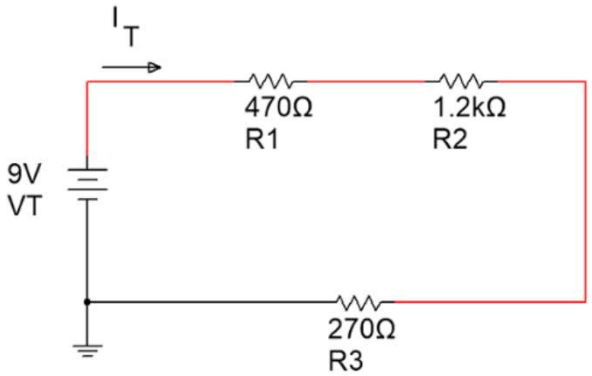
- A parallel circuit is a circuit in which there are several paths for electricity to flow.
- In this circuit, current could flow from point 1 – 2 – 7 – 8 -1 or it could flow from point 1 – 2 – 3 – 6 – 7 – 8 – 1.
- In a parallel circuit, all components are connected between the same set of electrically common points.
- Notice how each resistor connects the points that are parallel to each other.

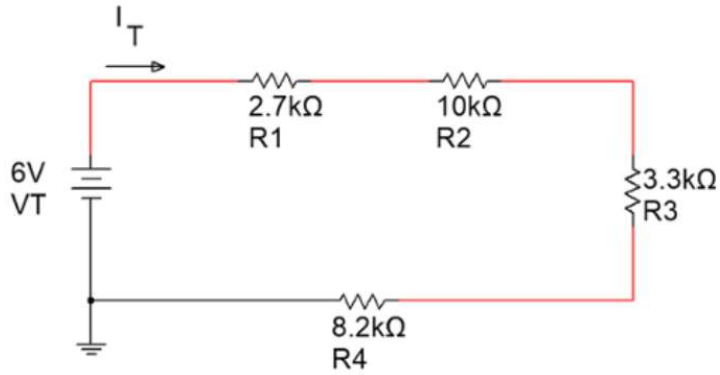


Challenge #1

- A) Create a series circuit using a 9V battery, a 470 Ohm resistor, a 1.2k Ohm resistor, a 270 Ohm Resistor, and an LED.

- B) Create a series circuit using a 6V battery, a 2.7k Ohm resistor, a 10k Ohm resistor, a 3.3k Ohm resistor, an 8.2k Ohm resistor, and an LED.

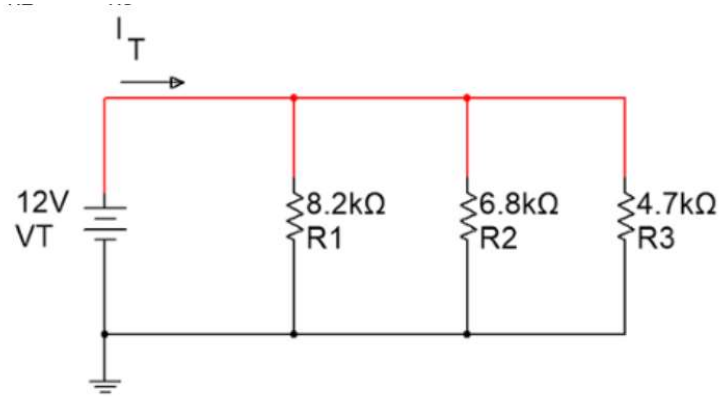


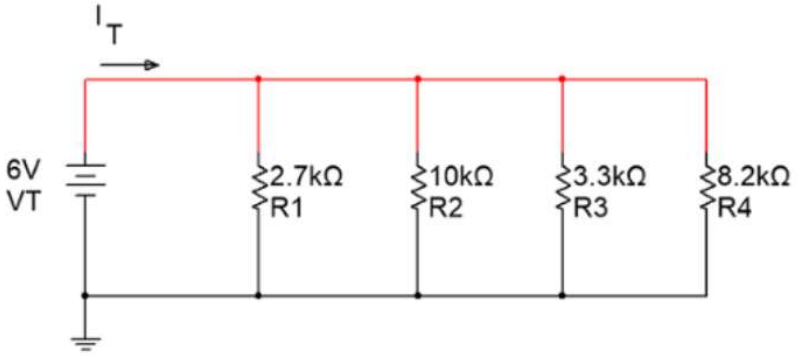


Challenge #2

- A) Create a parallel circuit using a 12V battery, an 8.2k Ohm resistor, a 6.8k Ohm resistor, 4.7k Ohm resistor, and an LED.

- B) Create a parallel circuit using a 6V battery, a 2.7k Ohm resistor, a 10k Ohm resistor, a 3.3k Ohm resistor, an 8.2k Ohm resistor, and an LED.





What can we do with breadboards?

- Once you get into building more advanced circuits, you can start using logic gates to implement your designs. These gates can be used to produce a specific output given a combination of switches or the press of a button.
- This website has lots of different projects that you could design using breadboards. You will be able to find detailed instructions and informative YouTube videos to help you learn more and complete projects.
- Link

Thanks For Coming! ☺

Ej and I will be around to answer any final questions.