

Understanding Voltage and Resistors

Voltage

Voltage is a measure of electrical potential energy. It's like the pressure in a water pipe. The higher the voltage, the greater the "push" or force driving the electrical current.

Resistors

Resistors are electronic components that oppose the flow of current. They are often used to control the amount of current flowing through a circuit. Think of them as a narrow pipe in a water system. The narrower the pipe, the more it restricts the flow of water.

How Resistors Limit Current

When a resistor is placed in a circuit, it creates a voltage drop across itself. This means that some of the voltage from the power source is used up by the resistor. As a result, less voltage is available to drive the current through the rest of the circuit.

Example

If you have a wire with 5 volts and you connect a resistor to it, the resistor will cause a voltage drop. This means that the voltage at the other end of the resistor will be less than 5 volts.

In this example, if the voltage at the other end of the resistor is 4 volts, then the entire wire from that point onward will have a voltage of 4 volts. This is because the resistor has effectively "used up" 1 volt of the original 5 volts.

Ohm's Law

The relationship between voltage, current, and resistance is described by Ohm's Law:

- $V = I * R$

Where:

- **V** is the voltage (in volts)
- **I** is the current (in amperes)
- **R** is the resistance (in ohms)

From this equation, we can see that for a given voltage, increasing the resistance will decrease the current flowing through the circuit.

In Summary

- **Voltage:** The driving force behind electrical current.
- **Resistors:** Components that limit the flow of current.
- **Ohm's Law:** Describes the relationship between voltage, current, and resistance.

By understanding these concepts, you can effectively design and control electronic circuits.

Watch this video: How to calculate the voltage drop across a resistor

<https://www.youtube.com/watch?v=YYSKRU1kDt4>

<https://www.youtube.com/watch?v=EeCh68a1GEg>