Raspberry Pi
&
Basic Circuits

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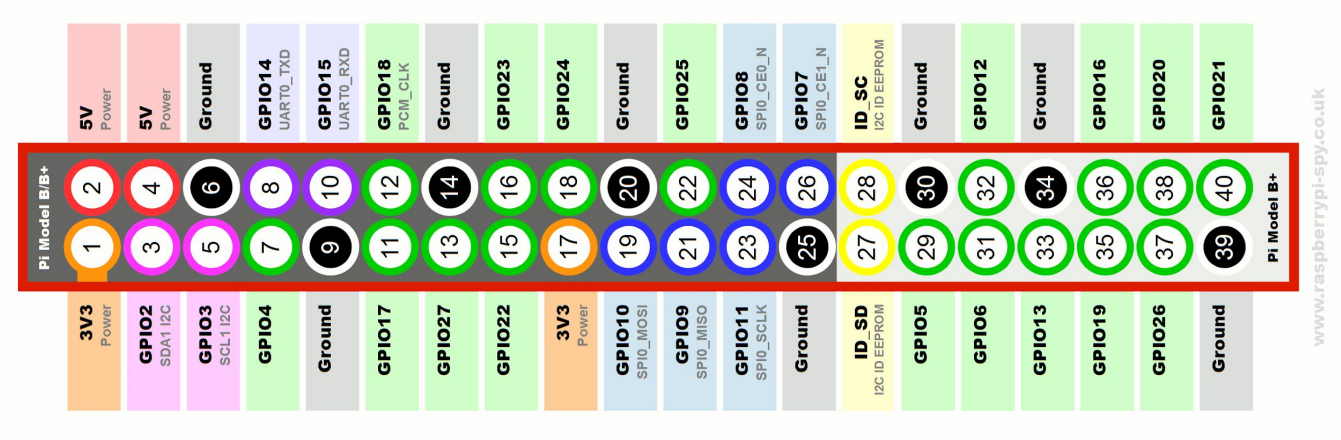
Raspberry Pi

I have better things to do than make a presentation that's already been made, so we'll use this one that I found online:

[Raspberry Pi Presentation]



Circuits Introduction

V = IR (Ohm's law)

- V = Voltage - also called 'potential'
- I = Current - the movement of electrons over a wire
- R = Resistance - supresses current

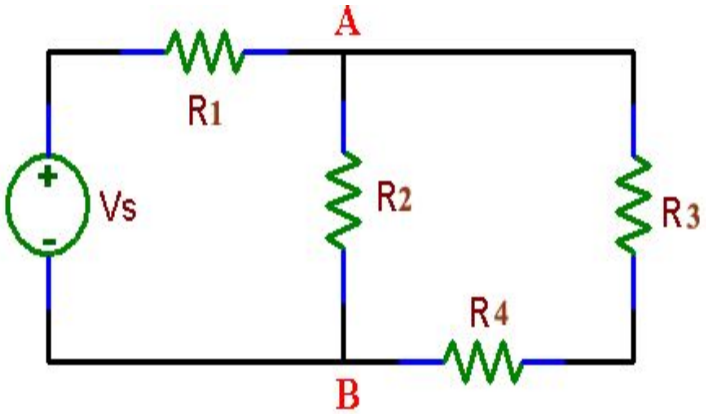
Power = IV

Jumpy River Analogy:

We can think of circuits like a water ride at a theme park.

- Voltage is the change in altitude
- Current is the flow of water
- Resistance is the width of the canal you're floating down.

The analogy isn't perfect, but it's good enough for today.



Some Basic principles

- Kirchoff's Voltage Law
  - The sum of all of the voltage drops in a closed loop has to equal zero.
- Branch Current Rule
  - The sum of the currents going into a node equals zero
- Parallel Resistance
  - Resistors in parallel can be seen as one resistor using the equation $\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \ldots\ldots + \frac{1}{R_n}$ etc
- Series Resistance
  - Resistors in series are can be seen as one resistor using the equation $R_T = R_1 + R_2 + R_3$

Voltage Sources

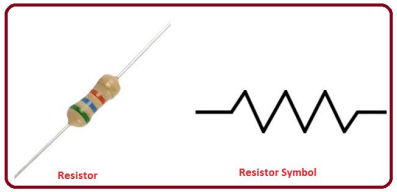
We most often use voltage sources although you can have current sources.

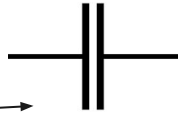
Common types of voltage sources:

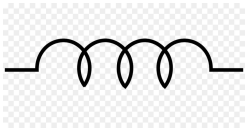
- DC - voltage remains contant.
- AC - voltage changes like a sine wave.
- Square waves
- Pulses
- Sawtooth waves

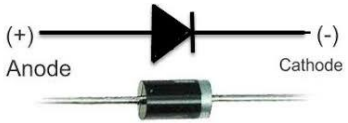
Circuit Components

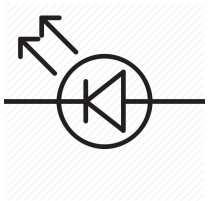
- Resistor
- Capacitor
- Inductor
- Diode
- Light Emitting Diode
- Transistor
- Switch

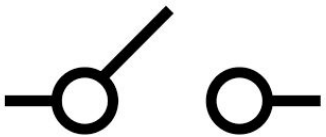


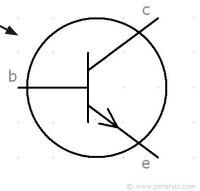












Digital Passcode Lock Demo

https://github.com/smalbadger/PiLock