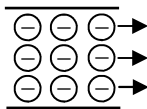


Current, Voltage, and Resistance

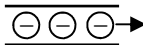
Current

Electricity is flowing electrons. The amount of electricity flowing is called current.



A lot of current.

More current means more water flowing or more electricity flowing (more electrons moving).



Very little current.

Water current is measured in gallons per minute. **Electrical current is measured in Amps** (which is coulombs/sec).

Devices that use more energy, use more current.

More current

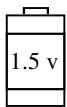
Less current

A light bulb is brighter when it has more current going thru it.

A device that uses more energy uses more current. A louder radio pulls (uses) more amps.

Voltage

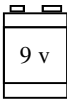
Voltage is what pushes electrons thru a circuit. More voltage gives more push or more pressure. More voltage will push more electrons. Higher voltage means more current.



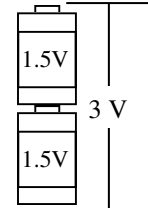
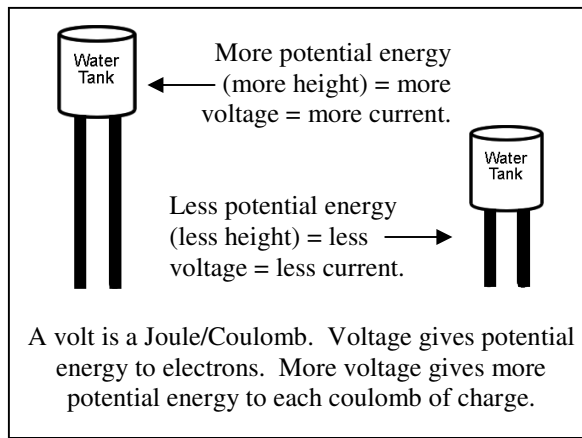
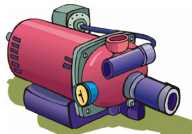
Weak pump



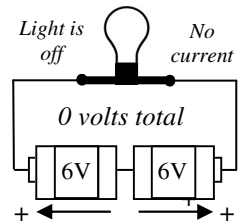
A stronger battery gives more voltage like a more powerful pump.



Strong pump



Batteries can add together, increasing voltage or subtract and cancel each other out, if they are put in the circuit wrong (see below).

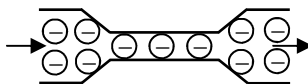


Resistance

Resistance slows down electricity. More resistance means less electricity, because it cannot flow as easily.



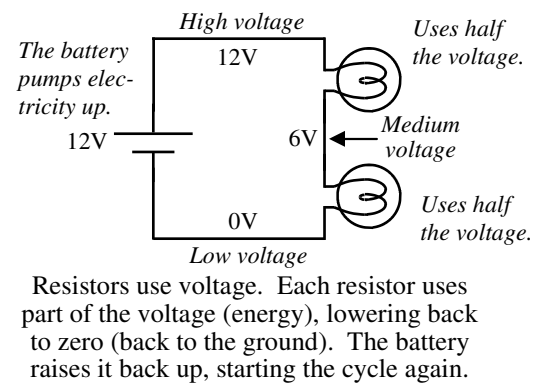
Dams hold back water. Resistors hold back electrons. Both reduce the current.



A waterwheel slows falling water, turning it into something useful (work).

Resistors

In a circuit, anything that does work has resistance: light bulbs, radios, computers, etc.



Ohm's Law

Ohm's Law shows how current changes when voltage or resistance changes.

$$I = \frac{V}{R}$$

Current (in amps [A]) → I = $\frac{V}{R}$

Voltage (in volts [V]) ←

Resistance (in ohms [Ω]) ←

Current equals the voltage divided by the resistance.

- How current changes:**
- Increasing voltage increases current.
 - Increasing resistance decreases current.
 - Decreasing voltage decreases current.
 - Decreasing resistance increases current.

Ex. How much current does a 12 V battery push through a 3 Ω resistor?

$V = 12 \text{ v}$ $R = 3 \Omega$ $I = ?$	$I = \frac{V}{R} = \frac{12 \text{ v}}{3 \Omega} = 4\text{A}$
---	---