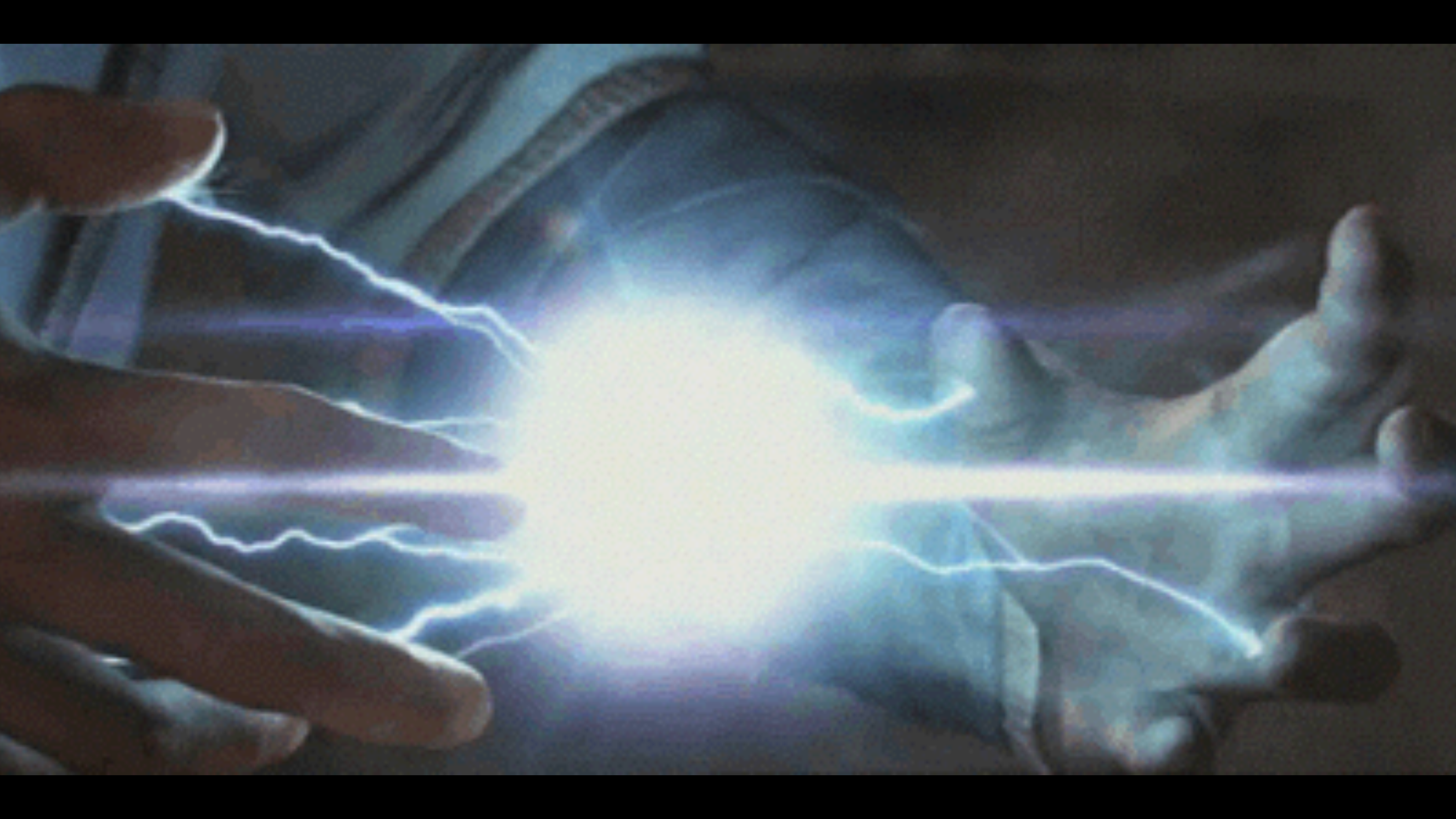


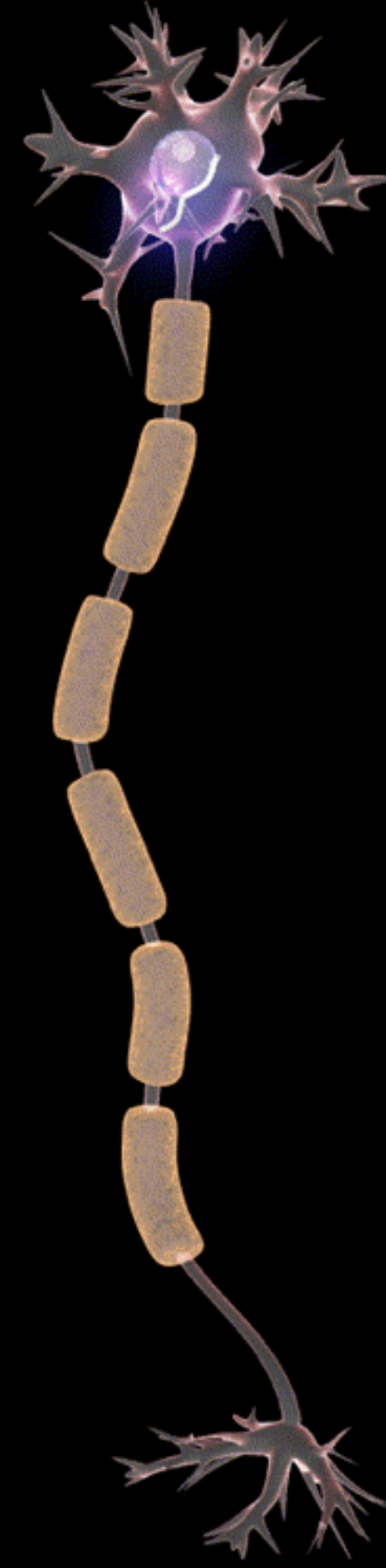
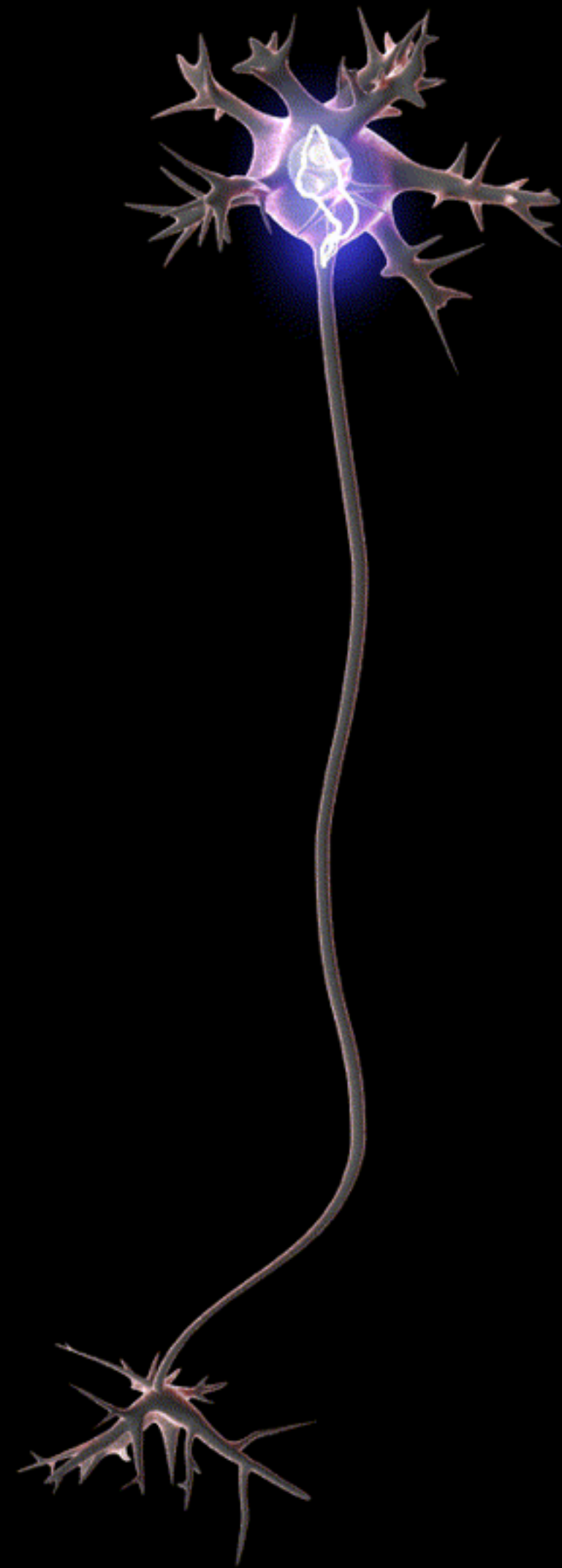


ELECTRICITY!













3.3 BILLION!!!

**3.3
BILLION!!!**

How big is a billion?

- If a billion kids made a human tower, they would stand up past the moon.
- If you sat down to count from one to one billion, you would be counting for 95 years.
- A billion seconds ago it was 1959.

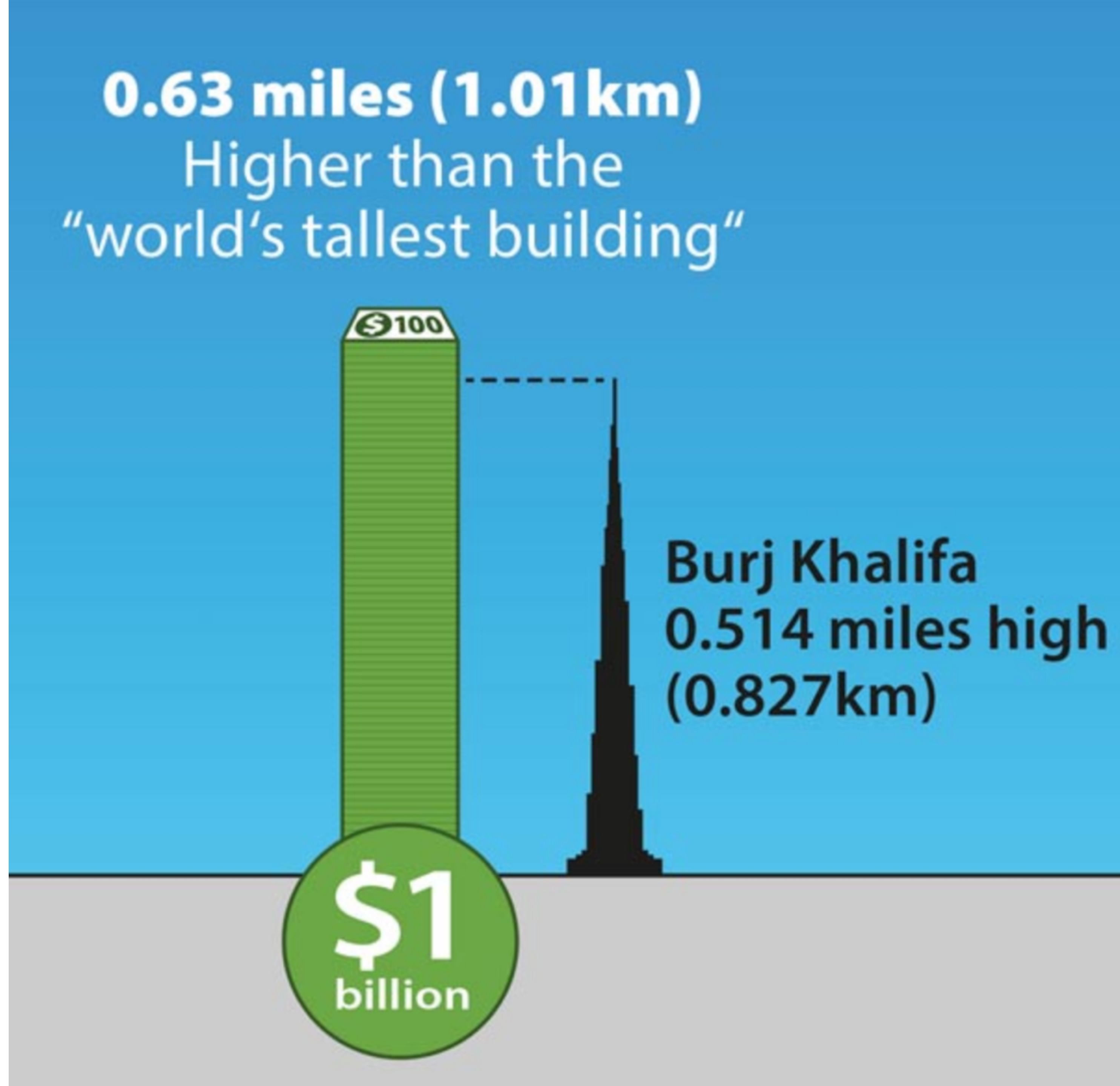
0.63 miles (1.01km)

Higher than the
"world's tallest building"

\$100

Burj Khalifa
0.514 miles high
(0.827km)

\$1
billion

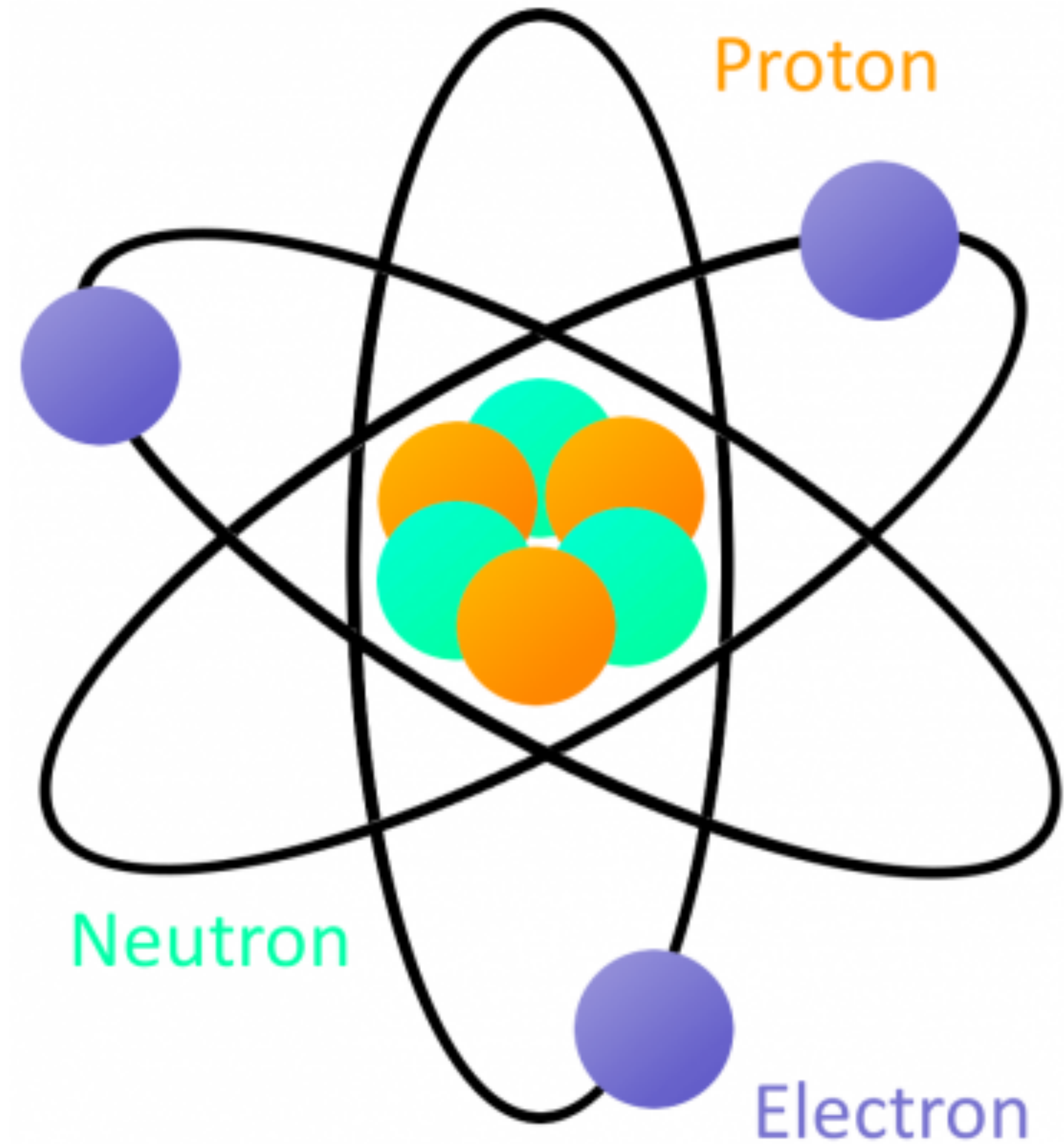




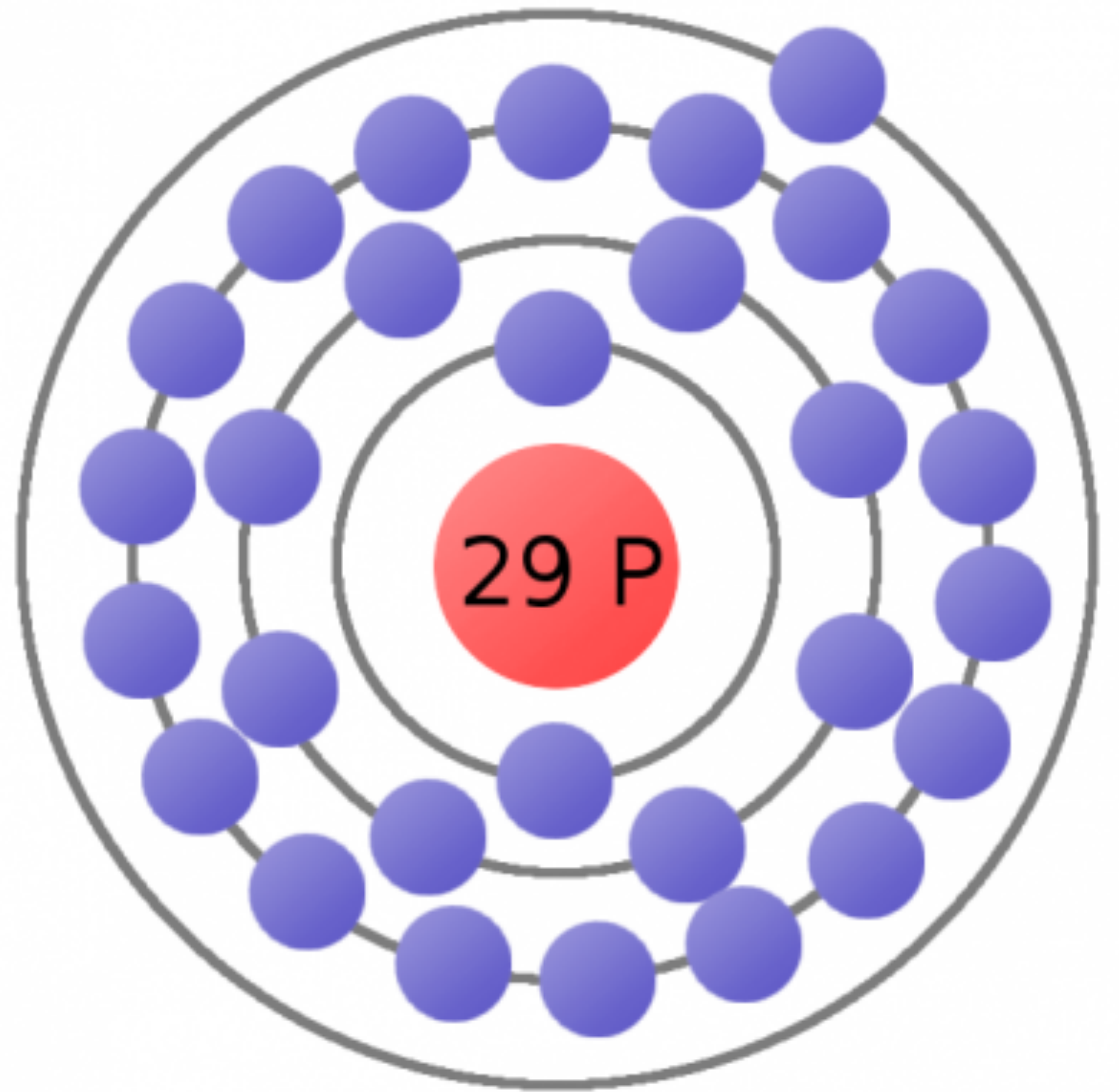


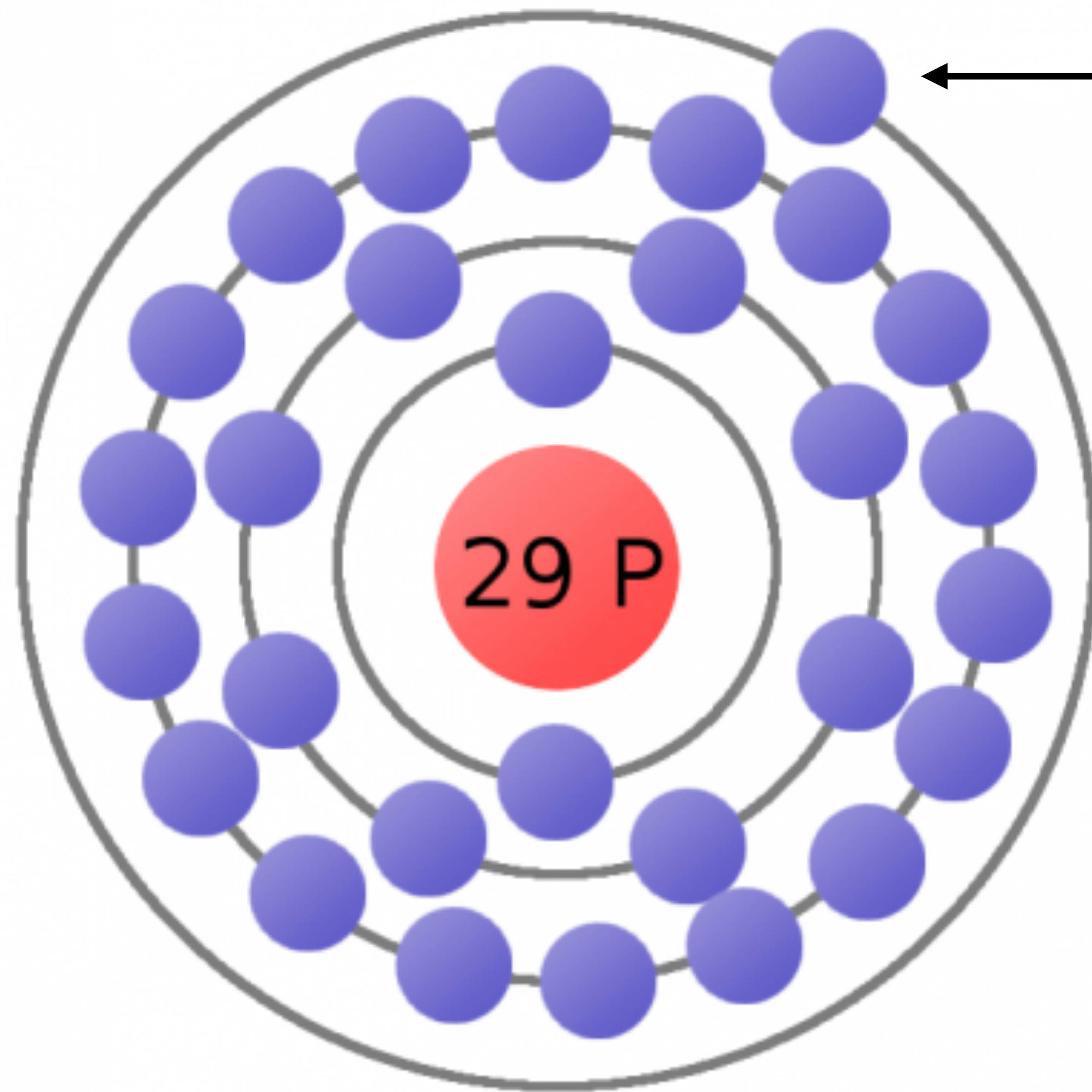
MAGIC

Let's go atomic

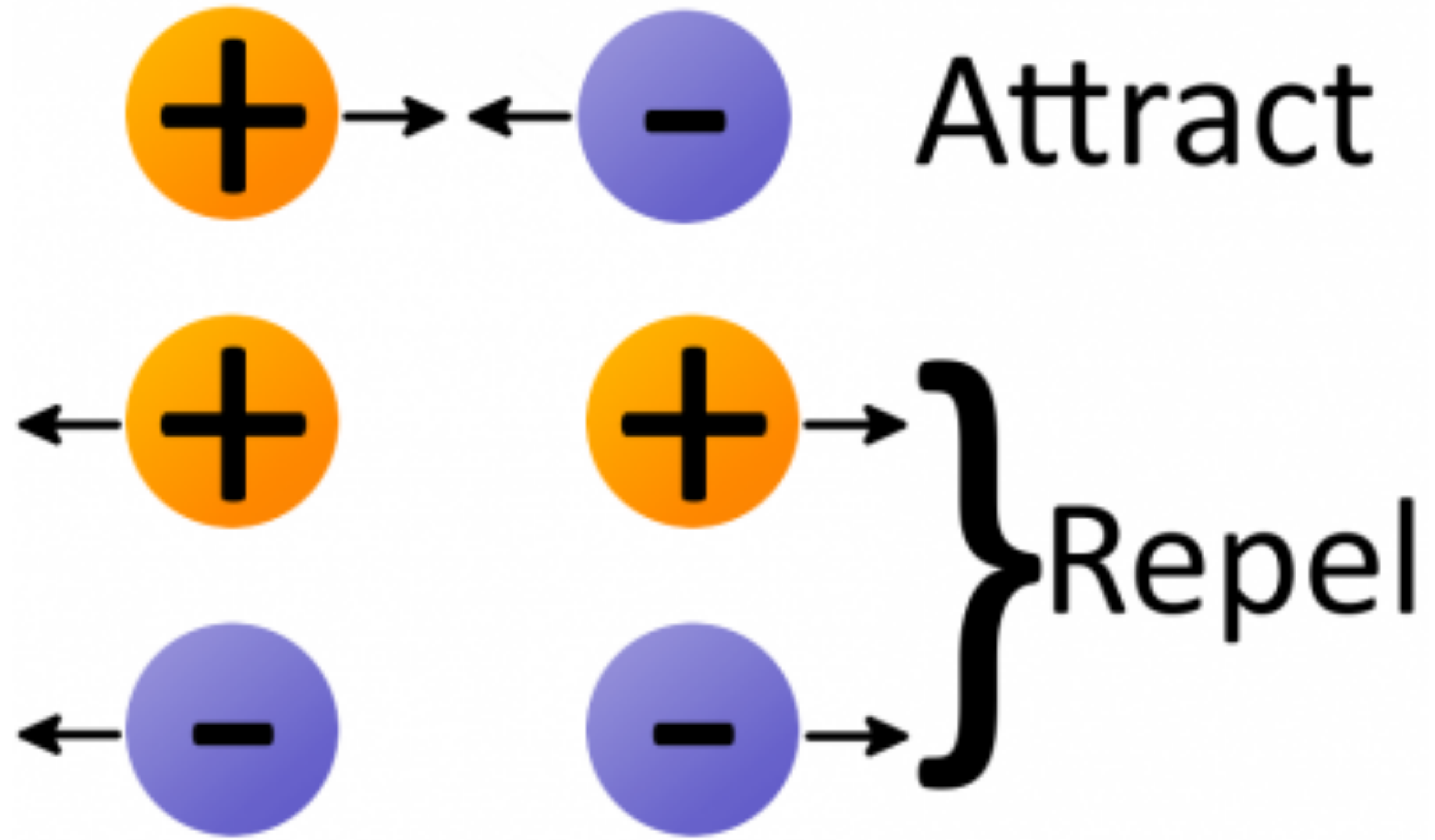


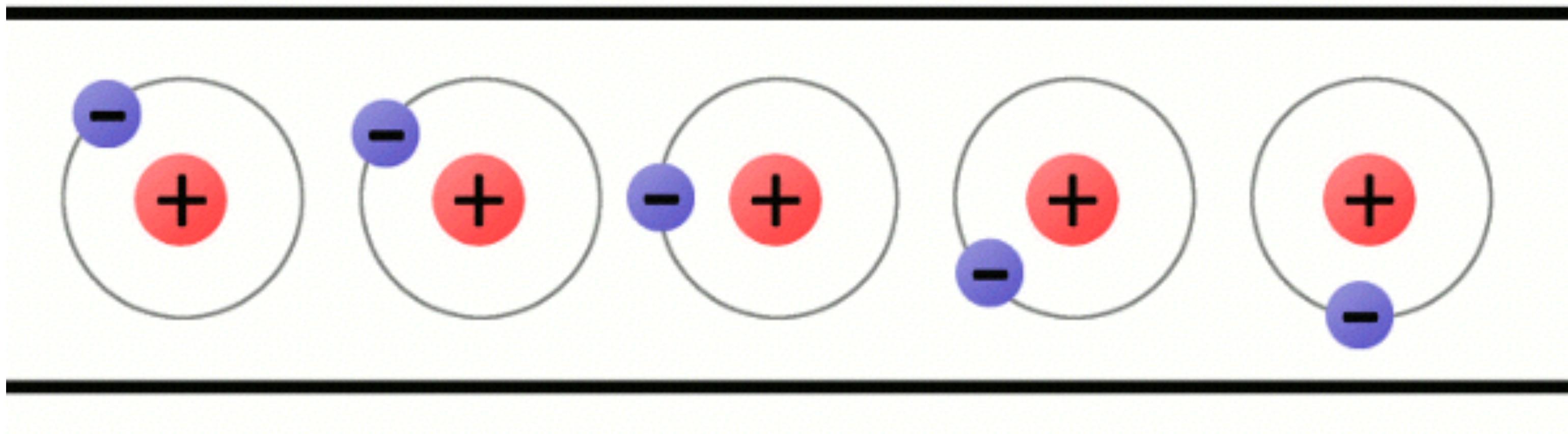
Equal number
protons and electrons

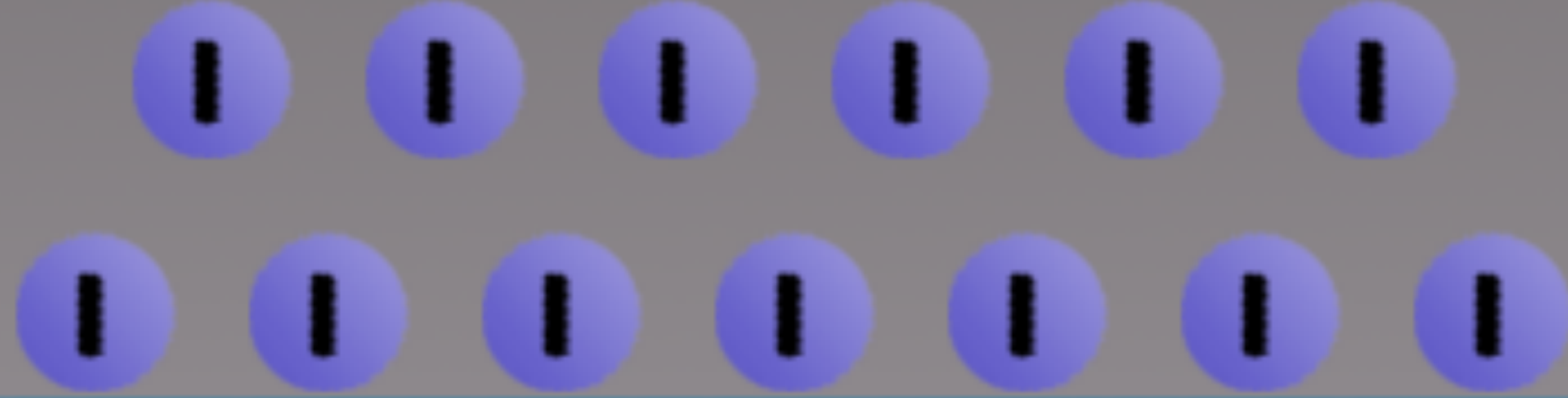




Valence electron

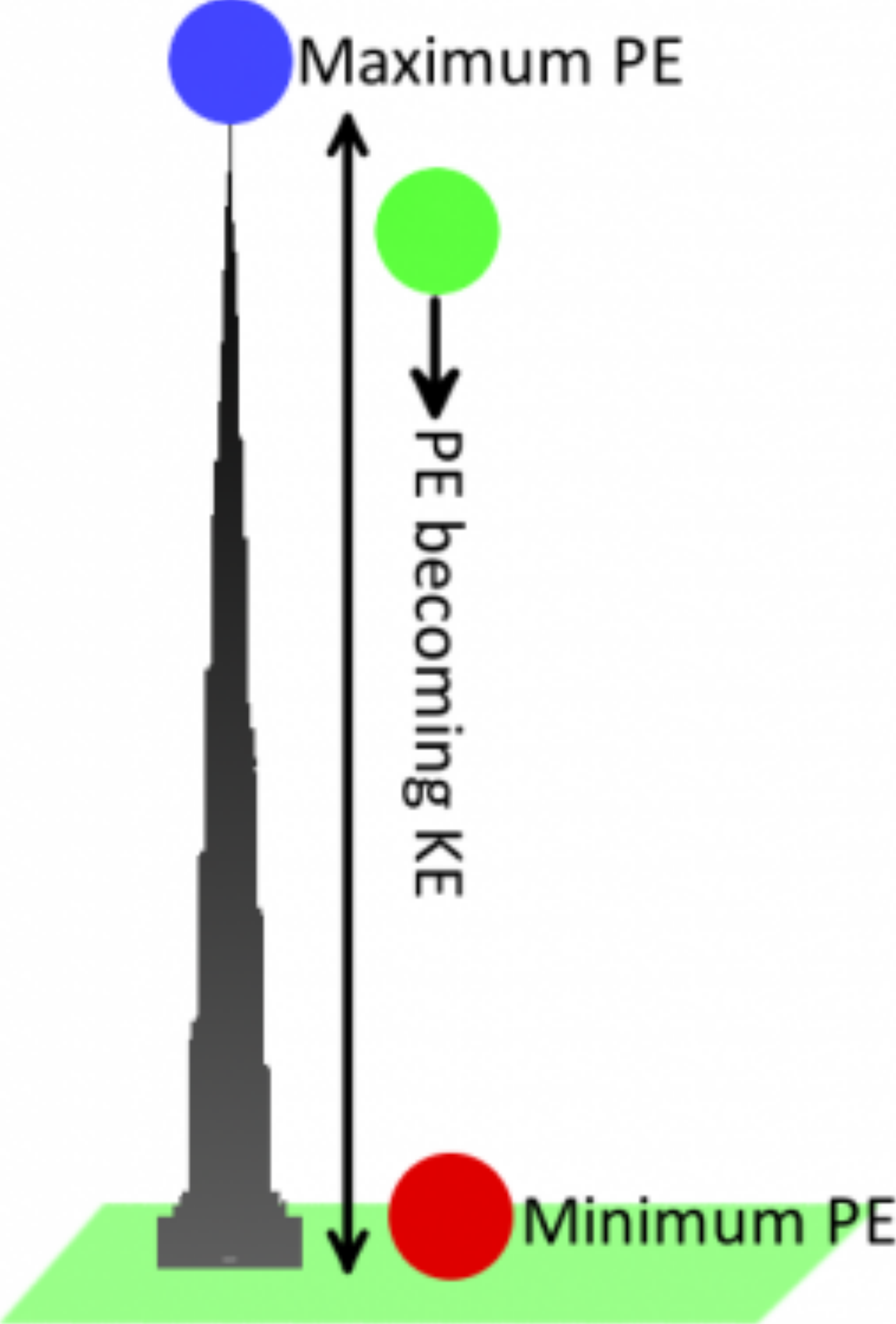






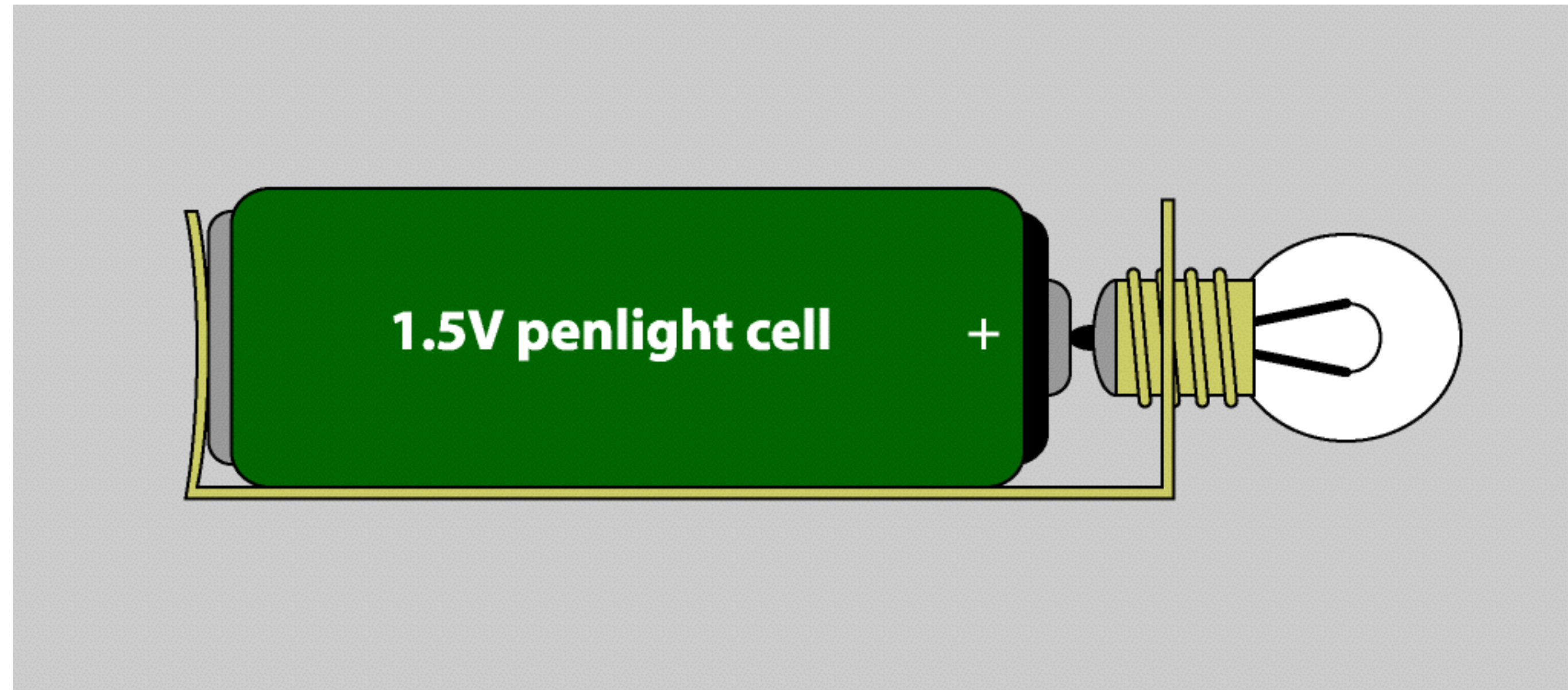
Insulator



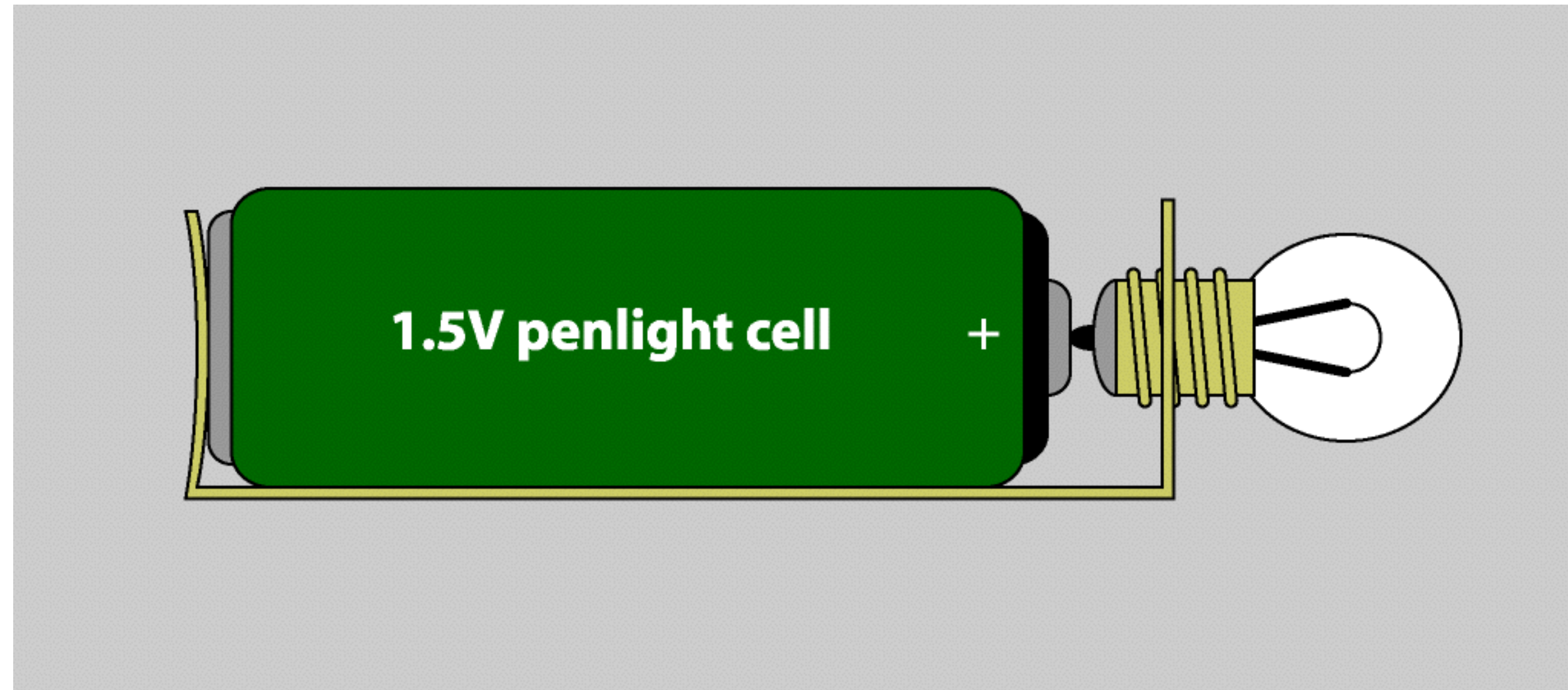


Voltage

The potential of electricity to move.



Voltage can also be thought of as pressure.

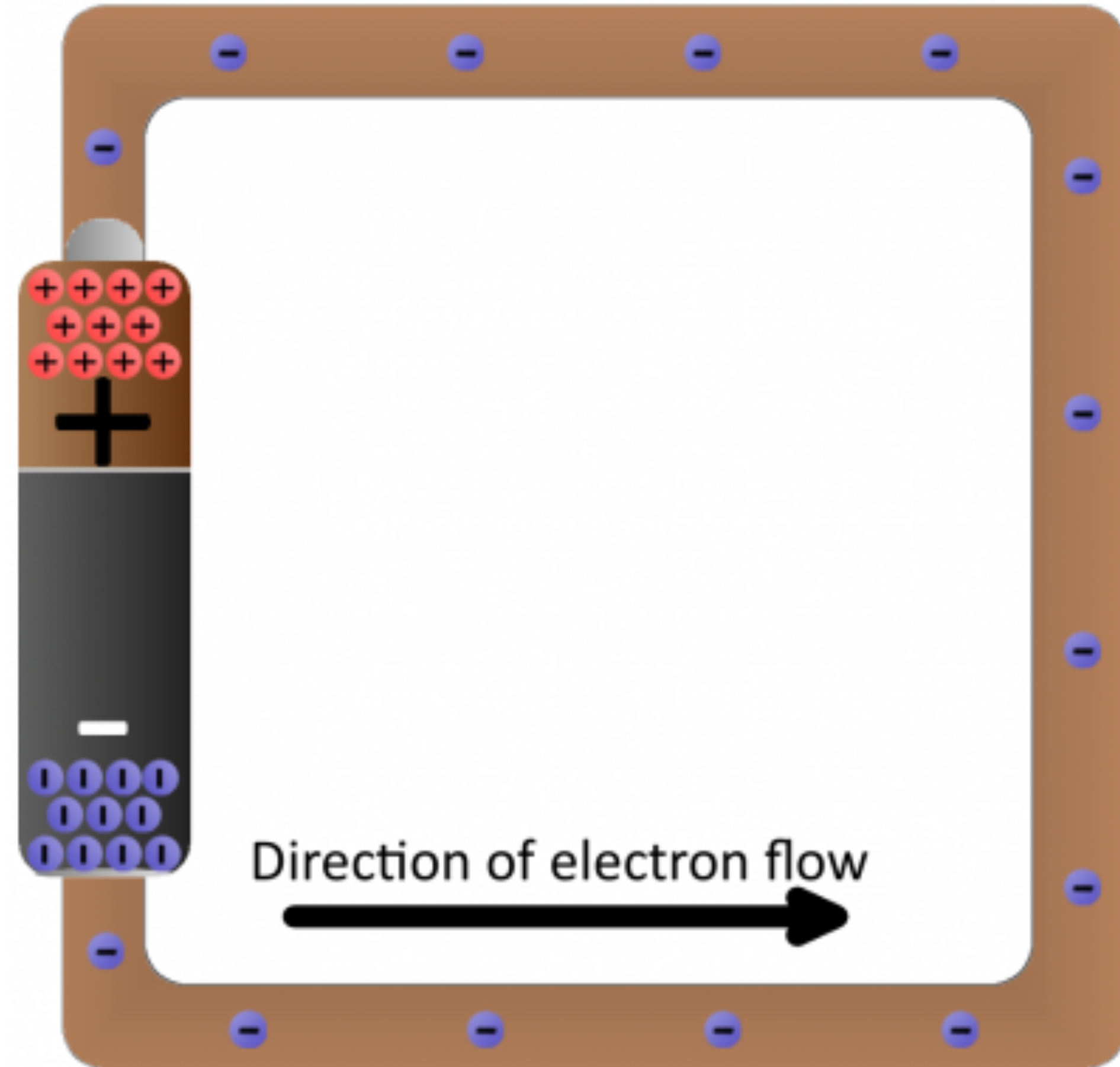


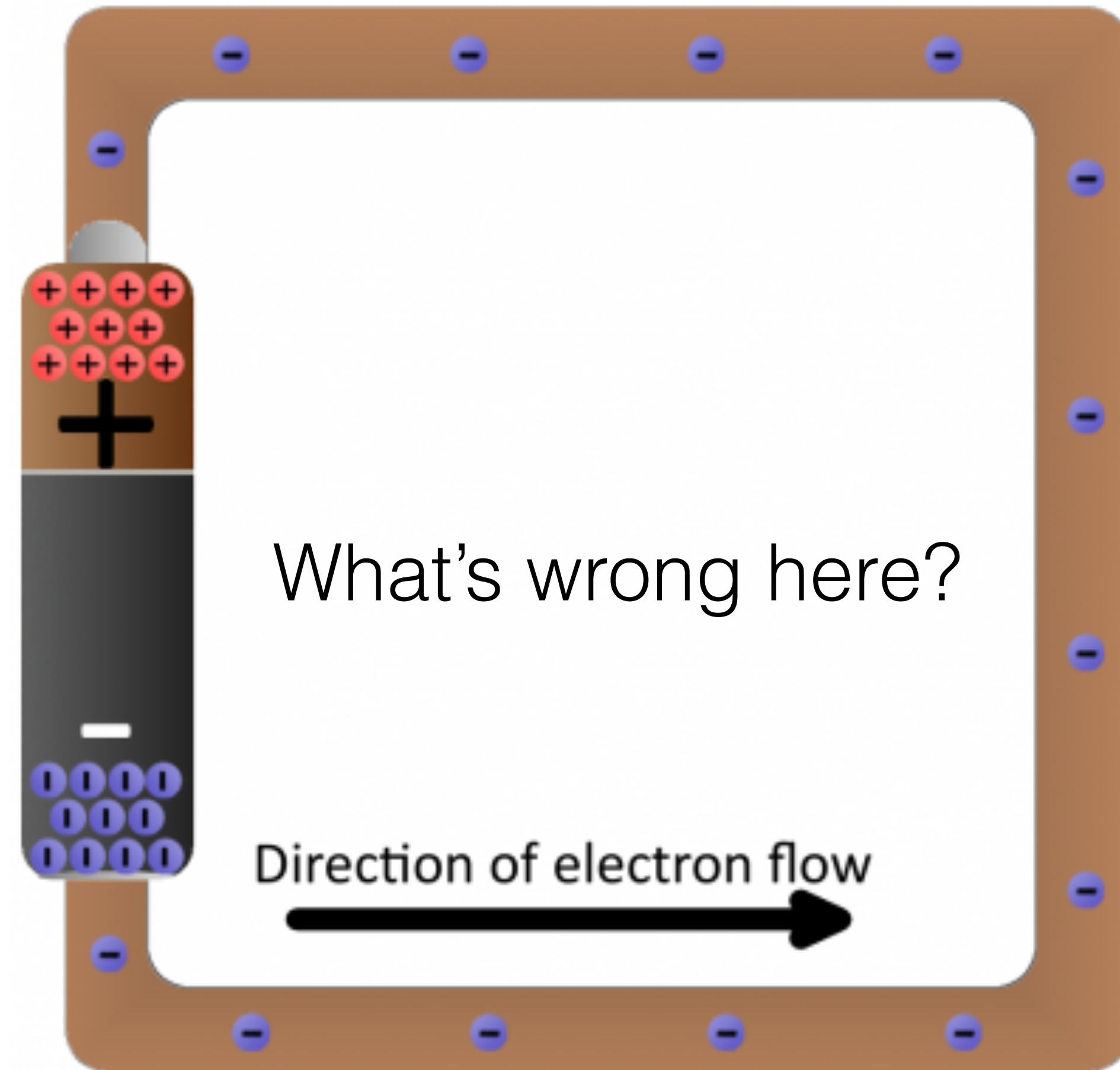
Source & Load
(everything must be consumed!)

Current

The flow of electricity.







**SHORT
CIRCUIT!!**

Resistance

Duh.

Georg Ohm (1800s)



Ohm's Law!!

$$v = i * r$$

Ohm's Law!!

voltage=current*resistance

Ohm's Law!!

voltage=current*resistance

current = voltage/resistance

Ohm's Law!!

voltage=current*resistance

current = voltage/resistance

resistance = voltage/current

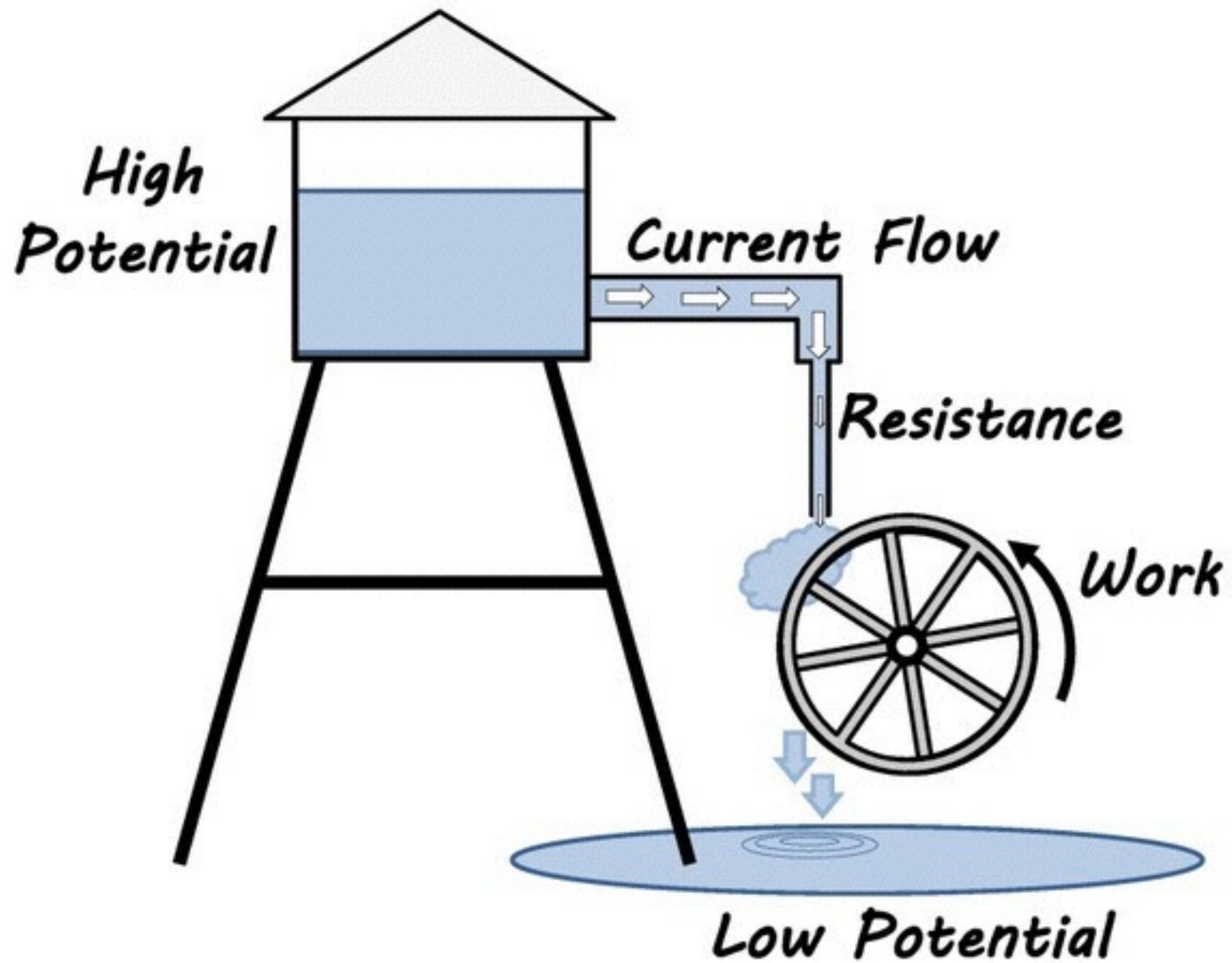
OHM'S LAW!!

$$v = i * r$$

voltage is measured in **Volts**

current is measured in **Amperes (Amps)**

resistance is measured in **Ohms**



Circuit

Power source & components that convert energy.

Huh?

Sensors

Take one type of energy and turn it into electricity (transduction).

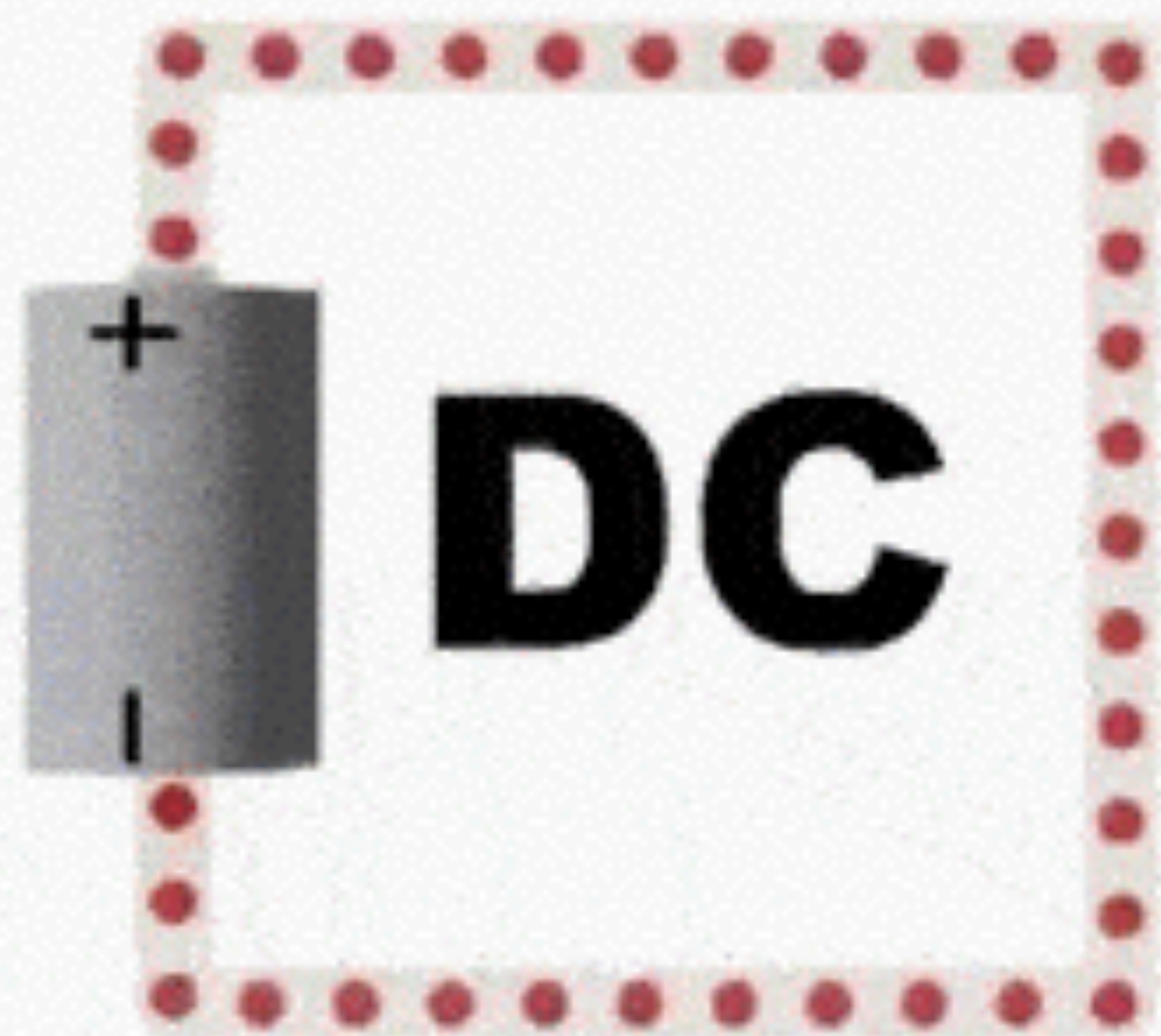
Actuators

Take electricity and turn it into another form of energy.

Physical computing is a lot about understanding what energy from people we can measure, how to measure it, and then what to do with that info.



AC DC?



Direct Current



Alternating Current



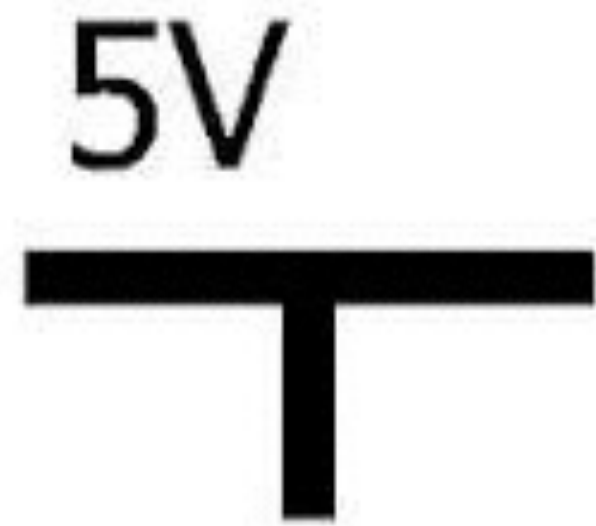
Can I hurt myself???

Let's try it out!

Parts

Schematics

Power & Ground



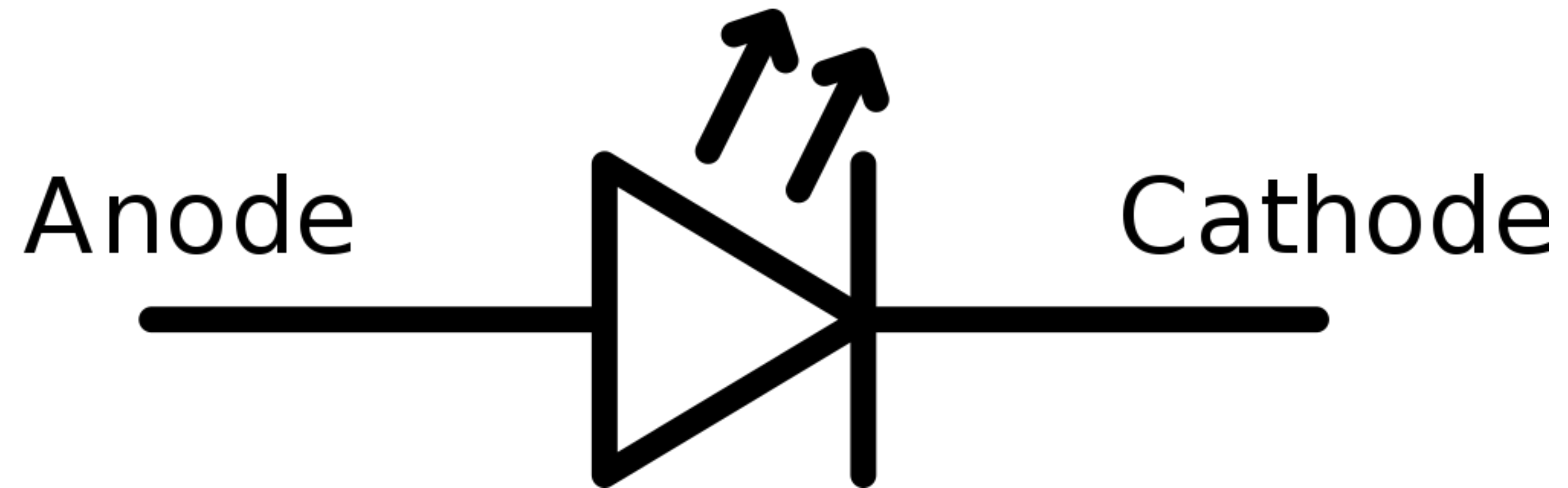
Resistor

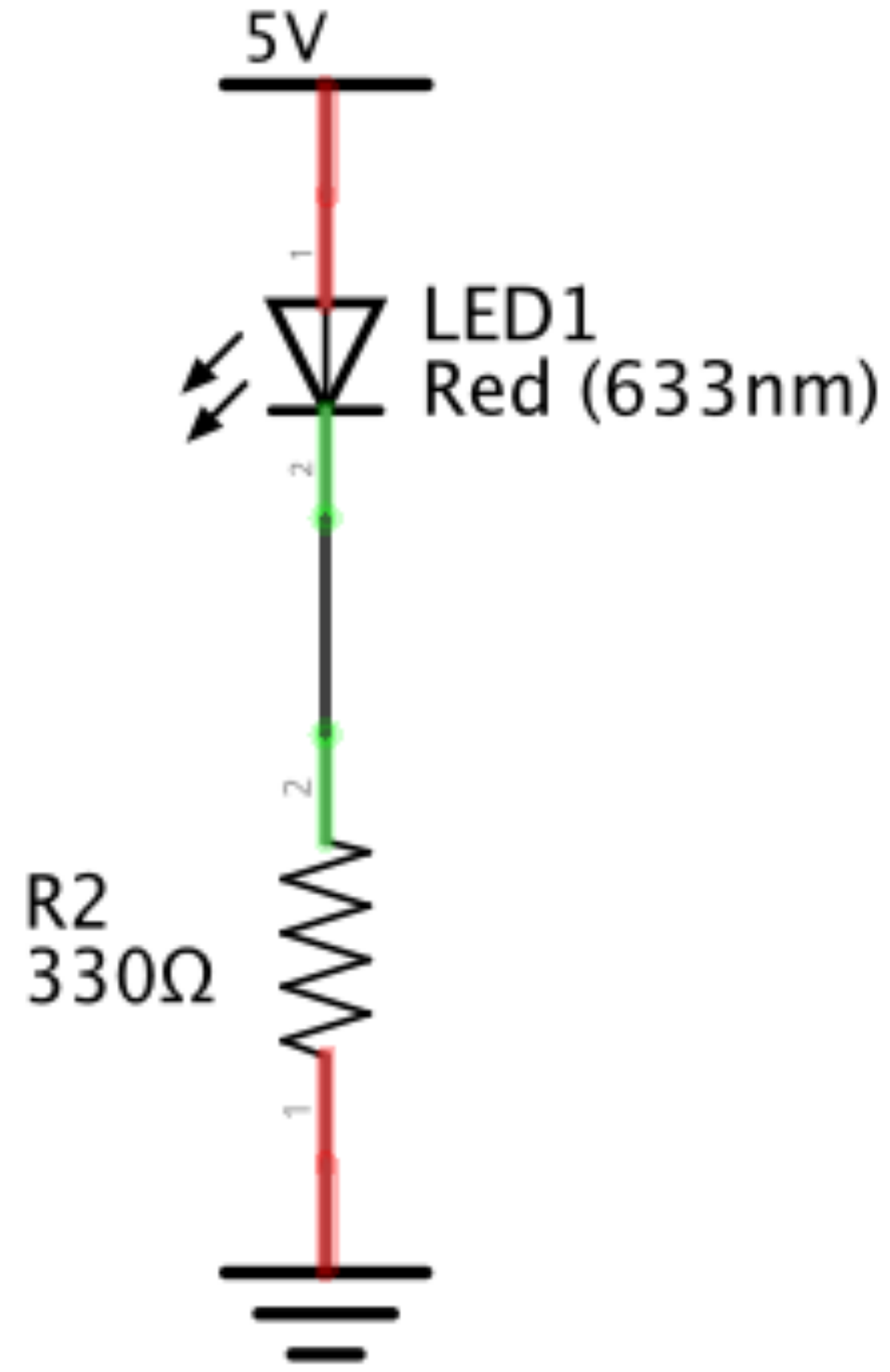


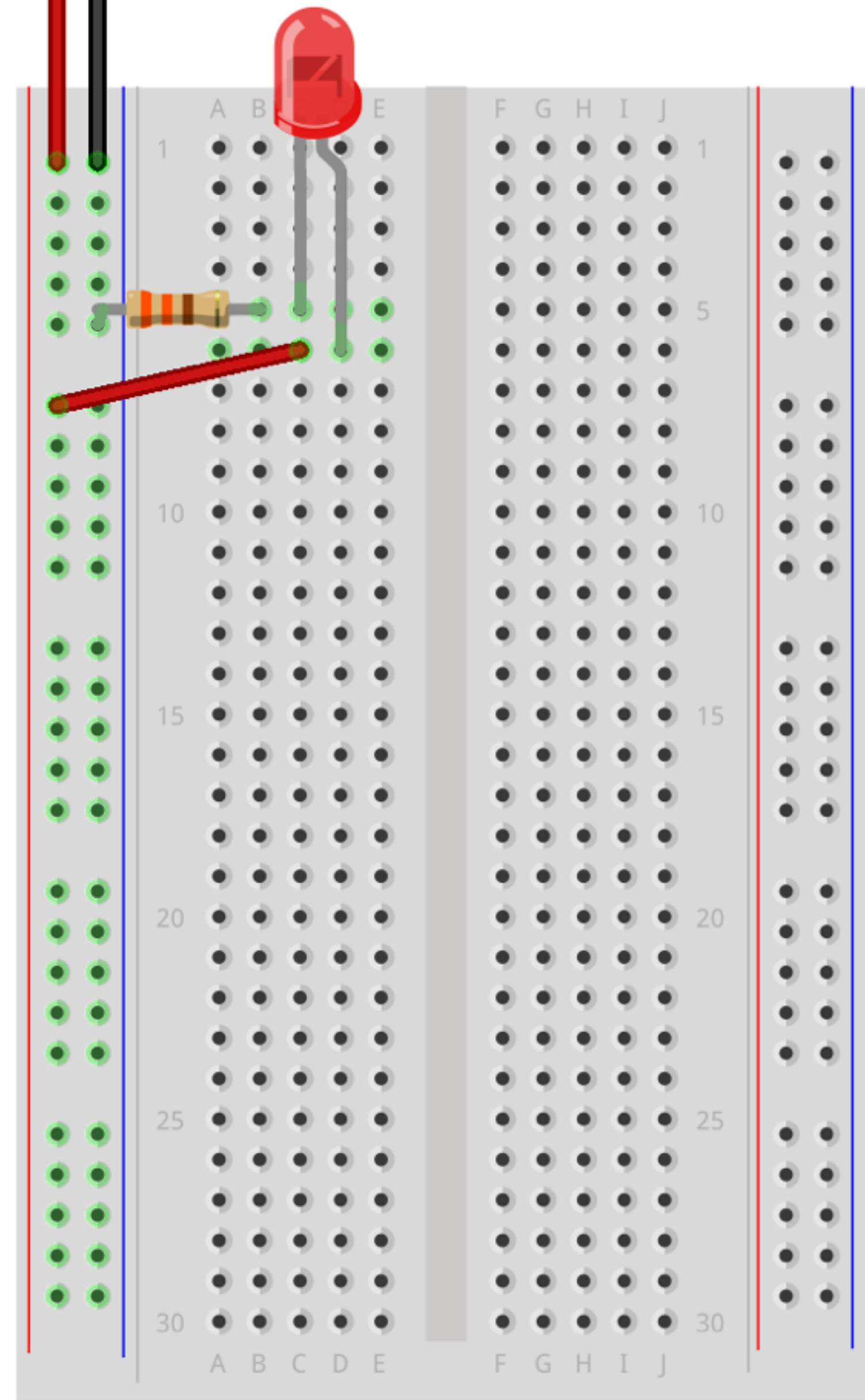
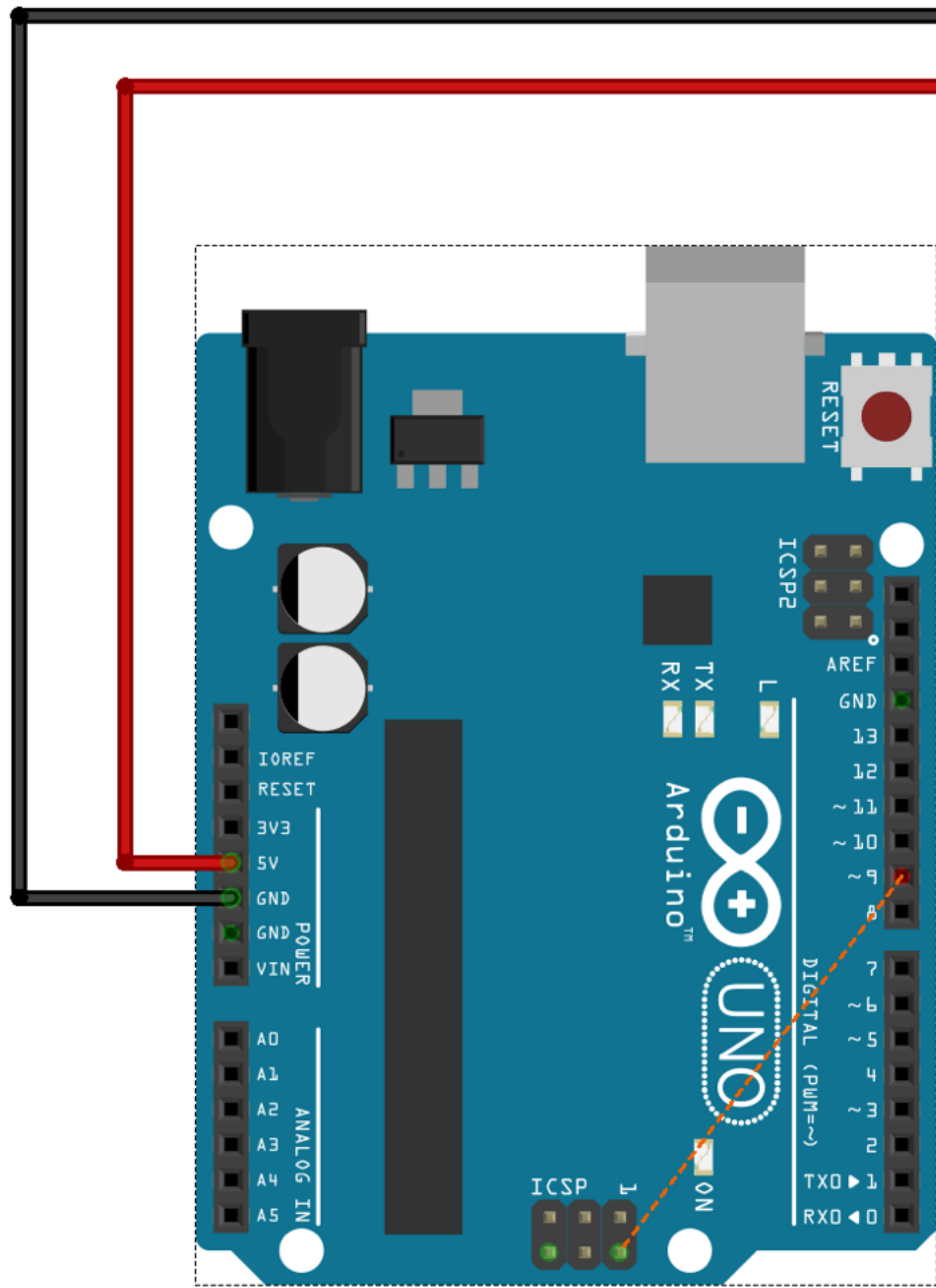
Switch



LED (Light Emitting Diode)

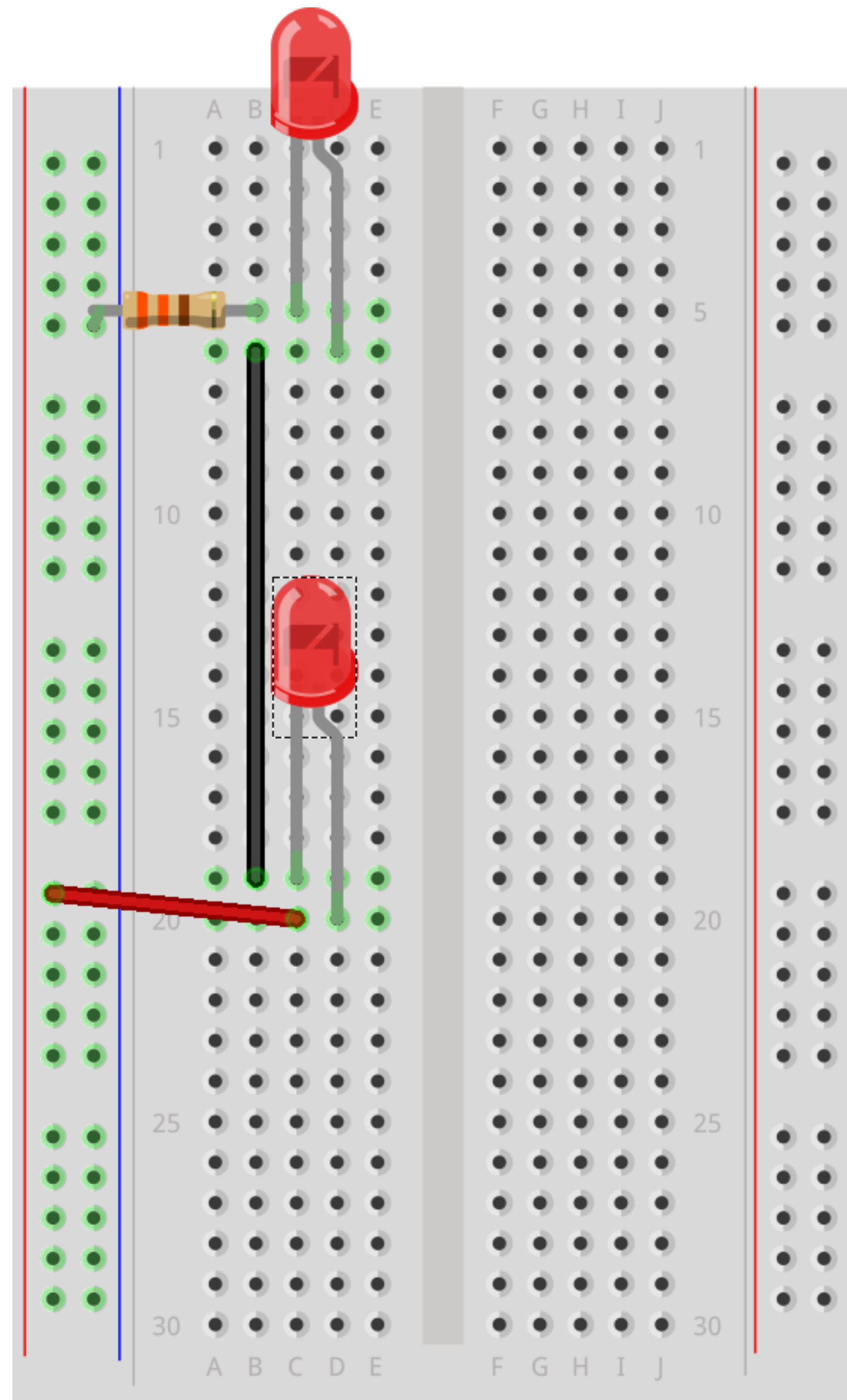




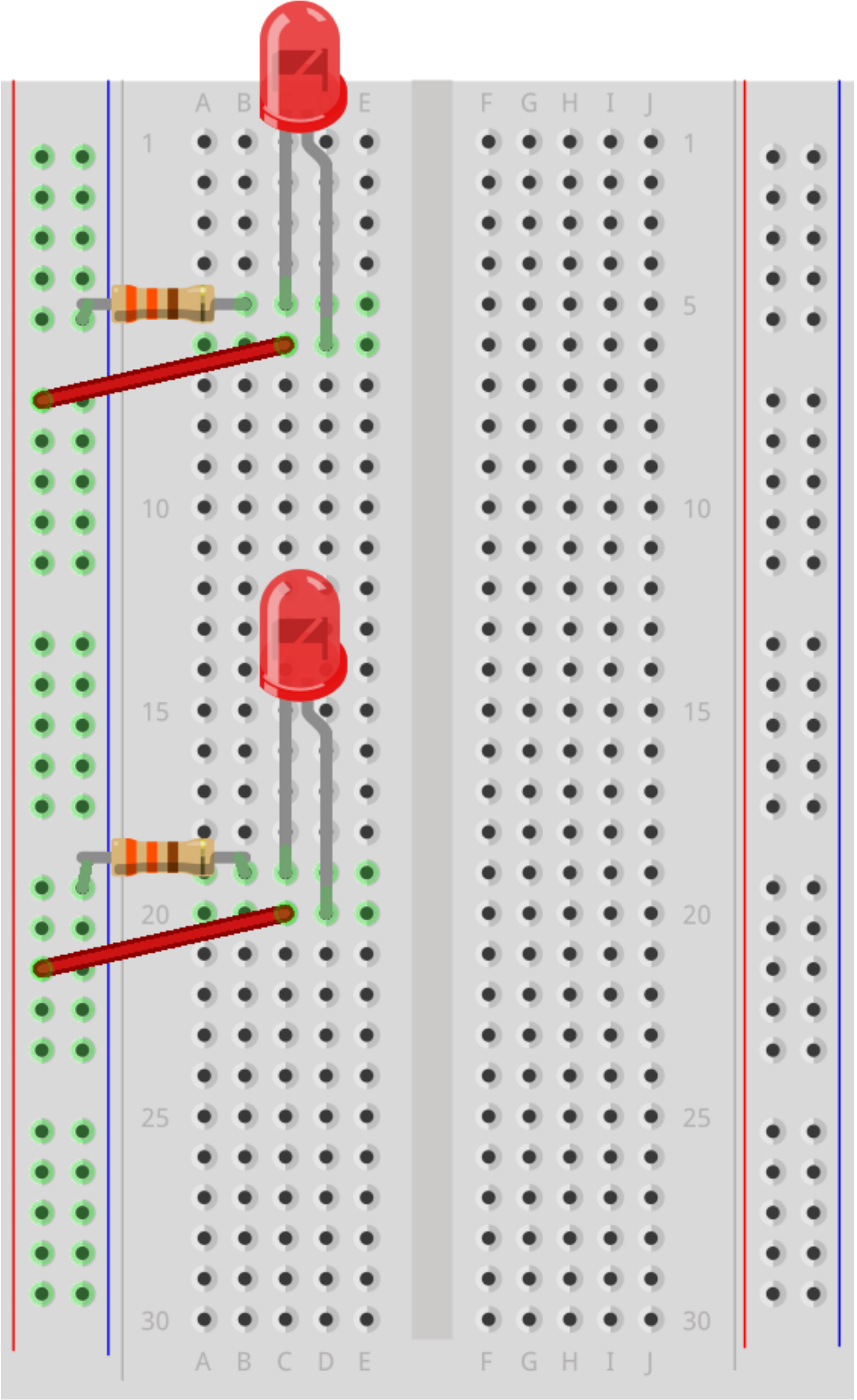


fritzing

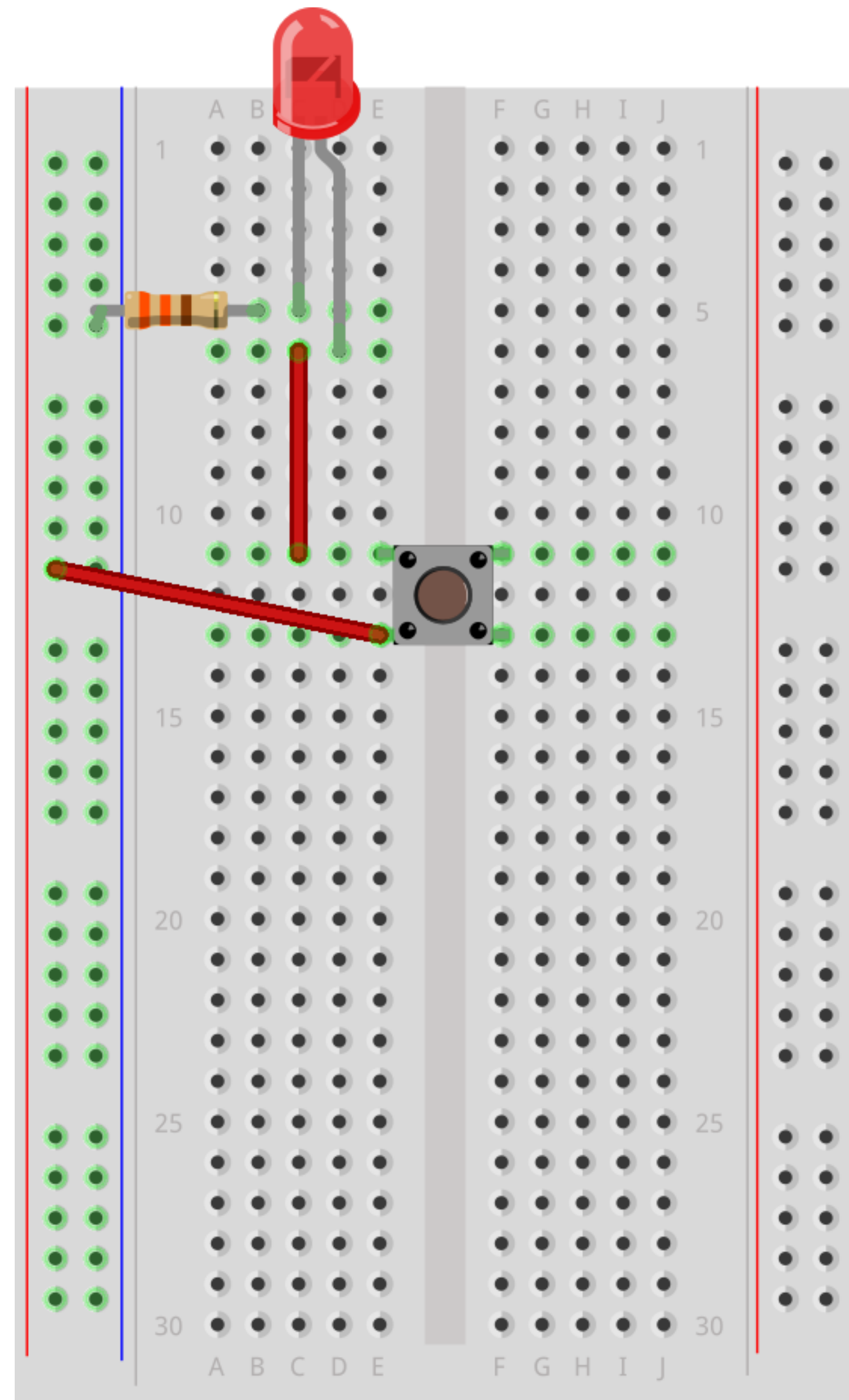
Series



Parallel

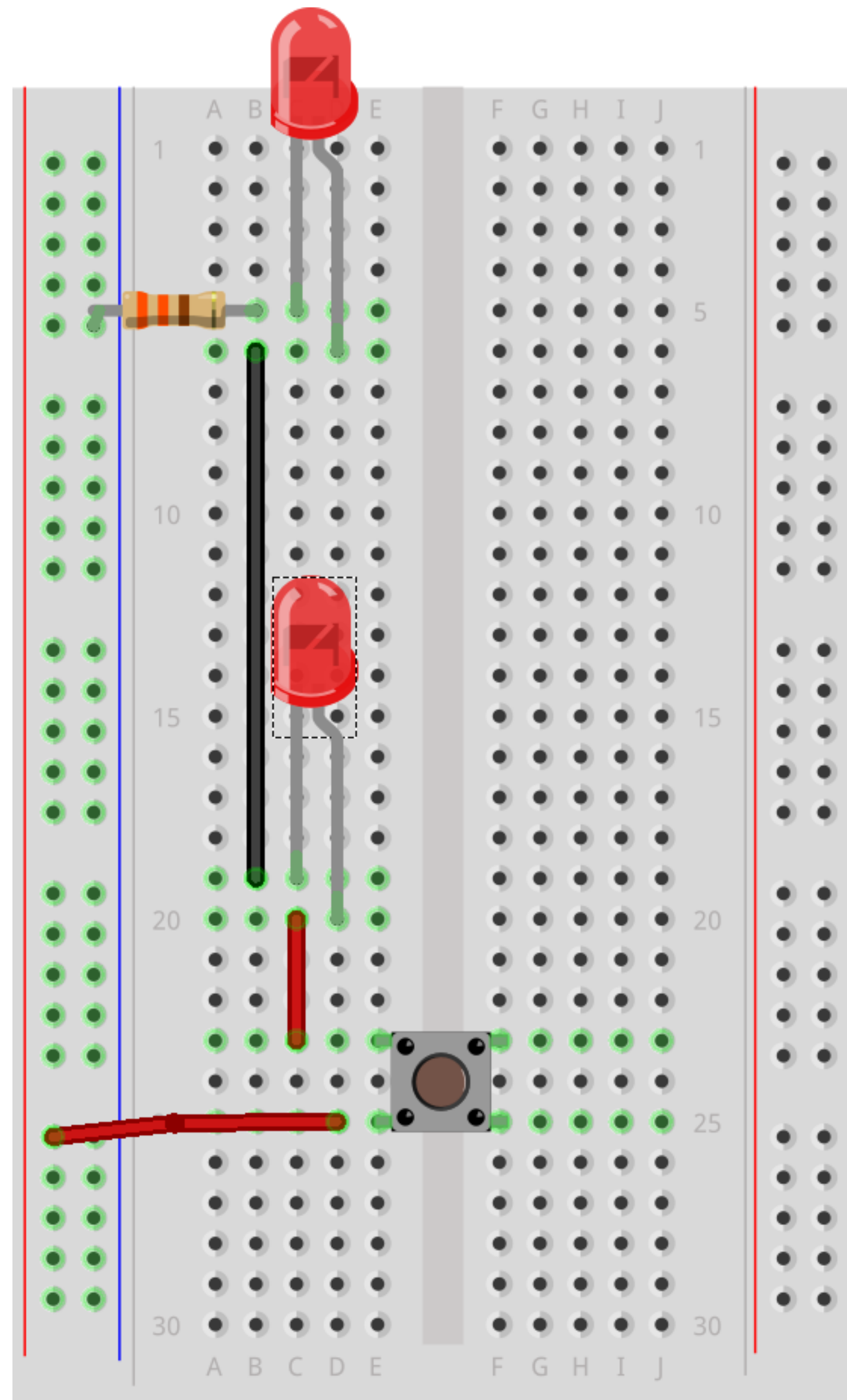


Button



fritzing

Button Series



Button Parallel

