Squishy Circuits

What is a circuit?

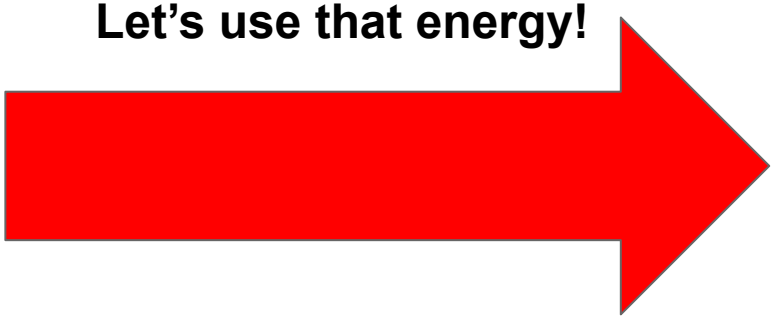
Batteries store energy!

Lights need energy to run!

What is a circuit?

Batteries store energy!

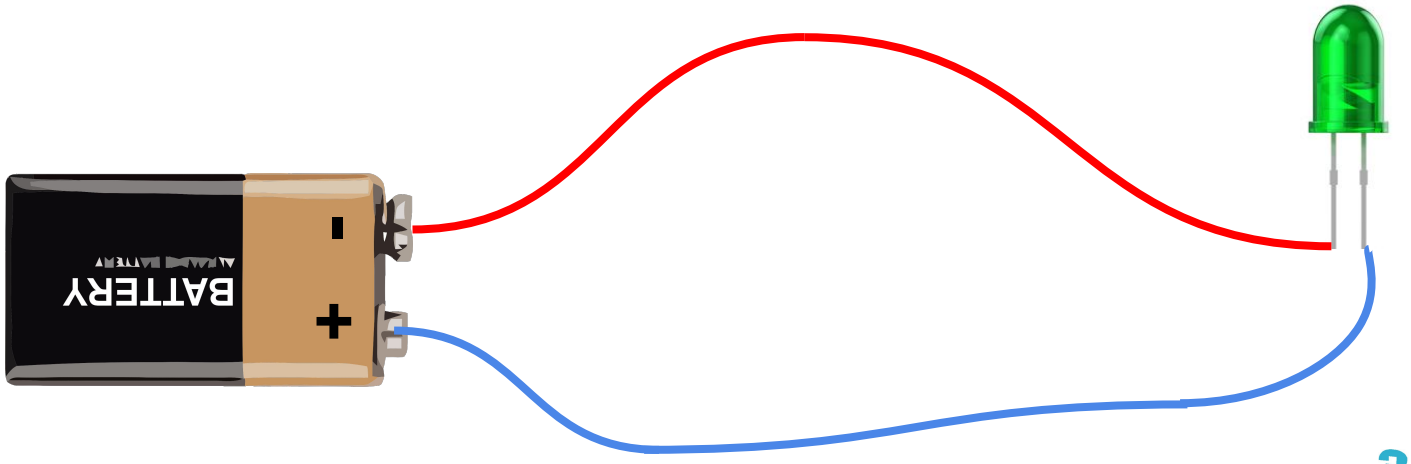
Let's use that energy!



Lights need energy to run!

What is a circuit?

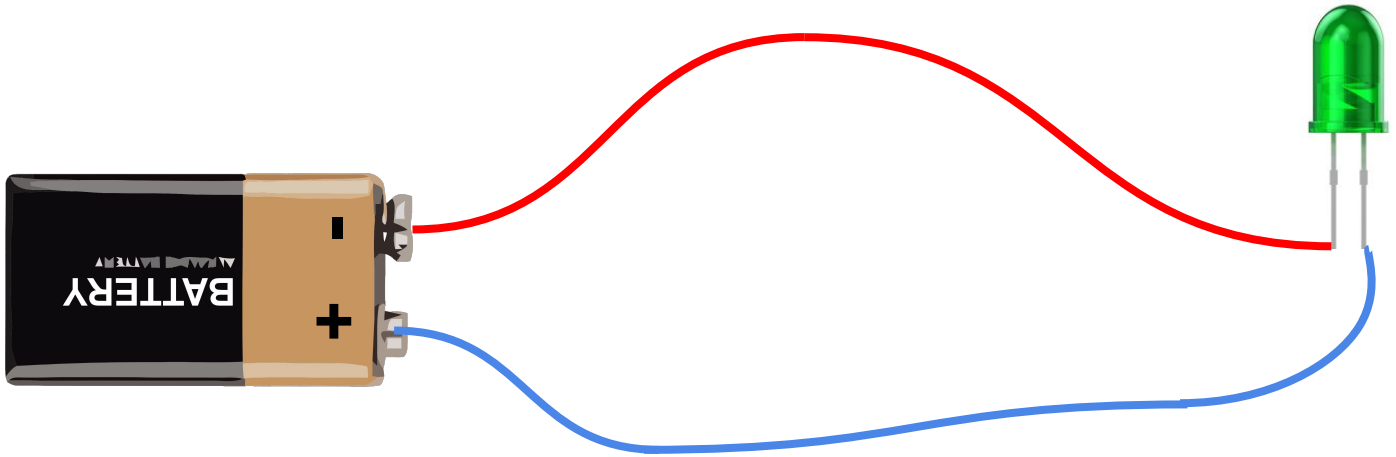
To use the energy to turn on the light we need to make a closed circuit.



What does that mean???

What is a circuit?

Electricity is just a stream of electrons going around in a circle.



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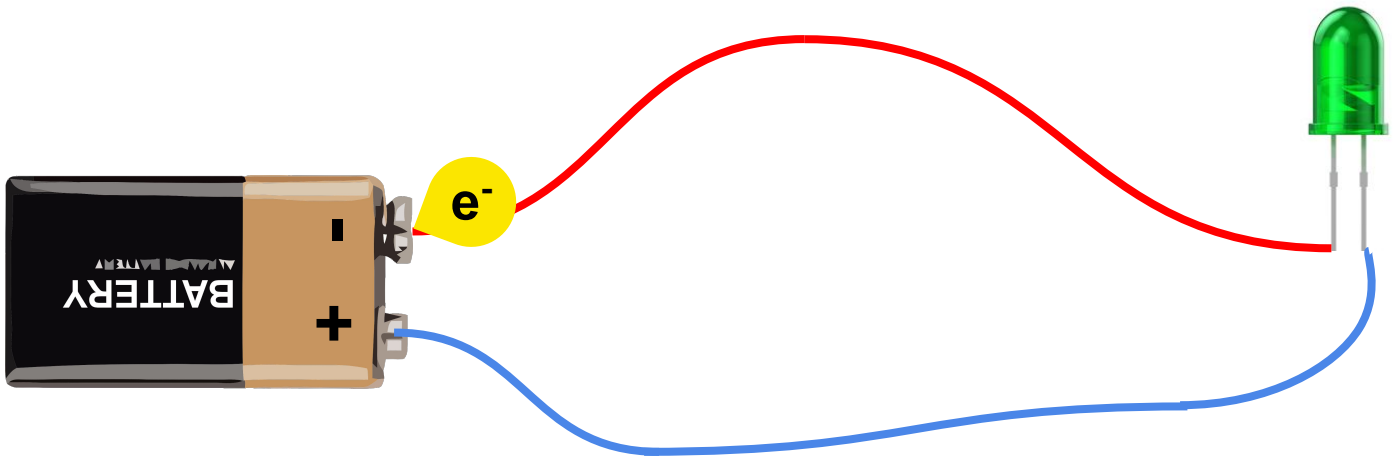

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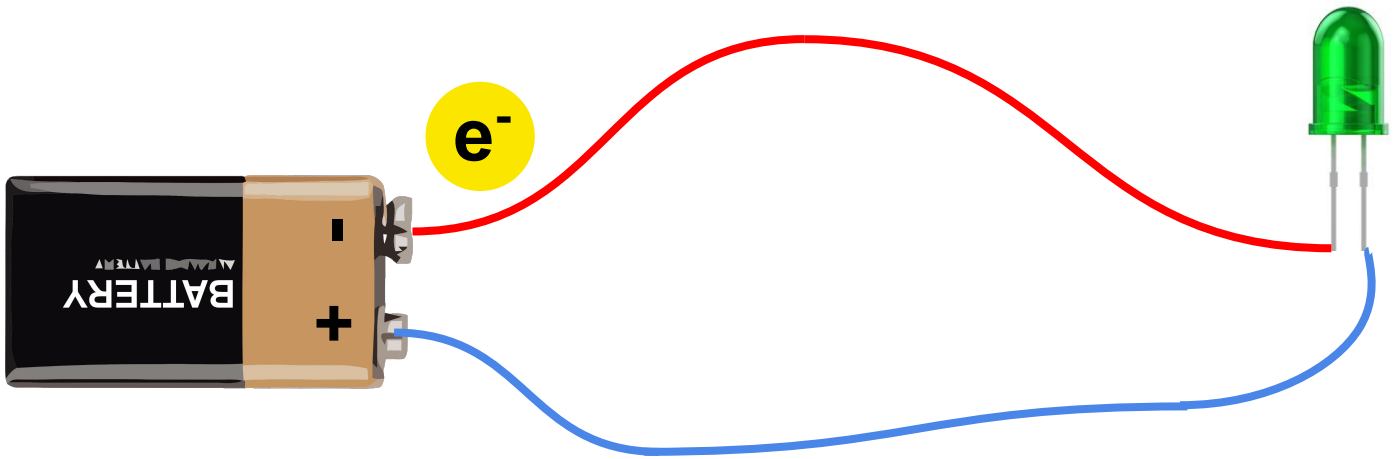

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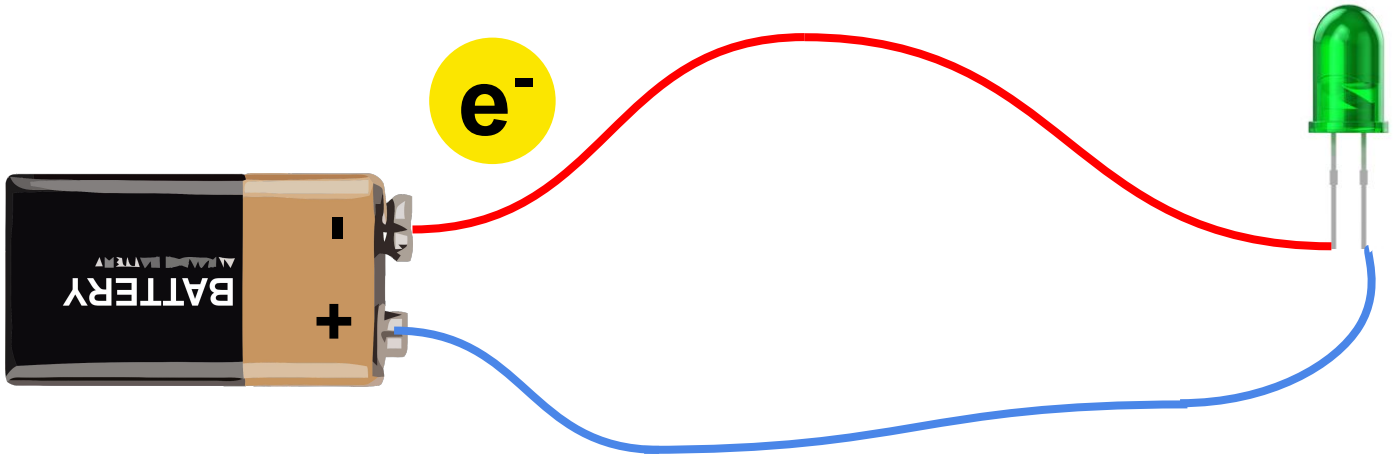

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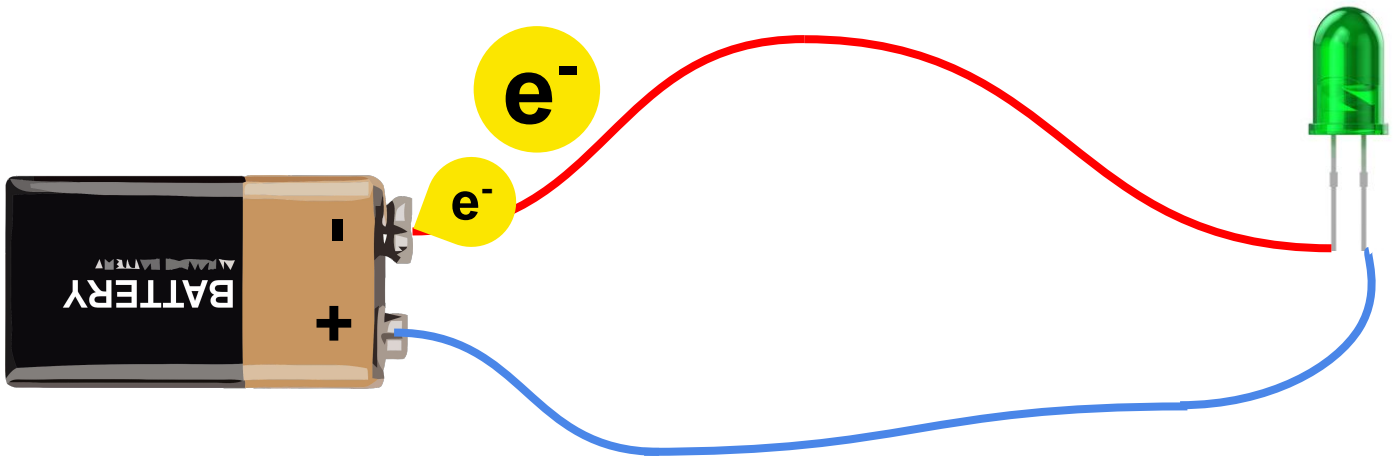

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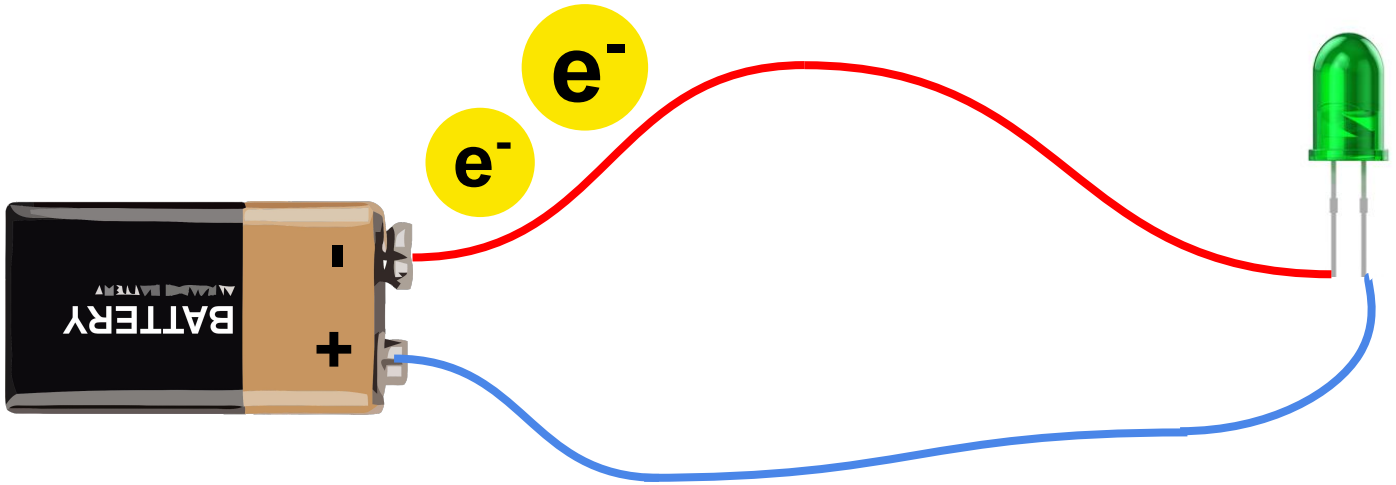

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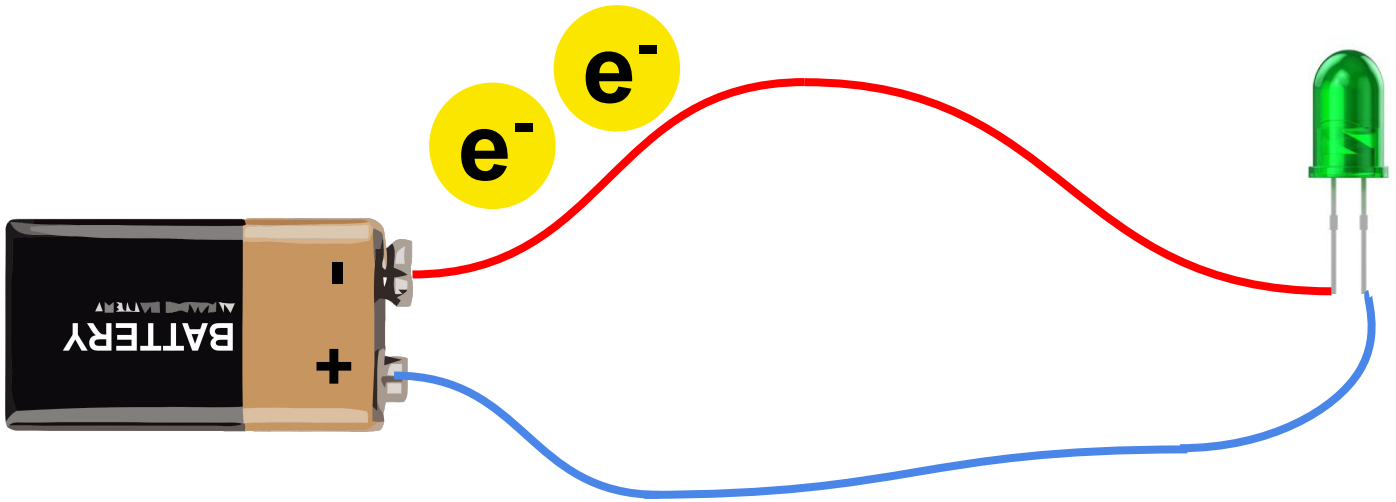

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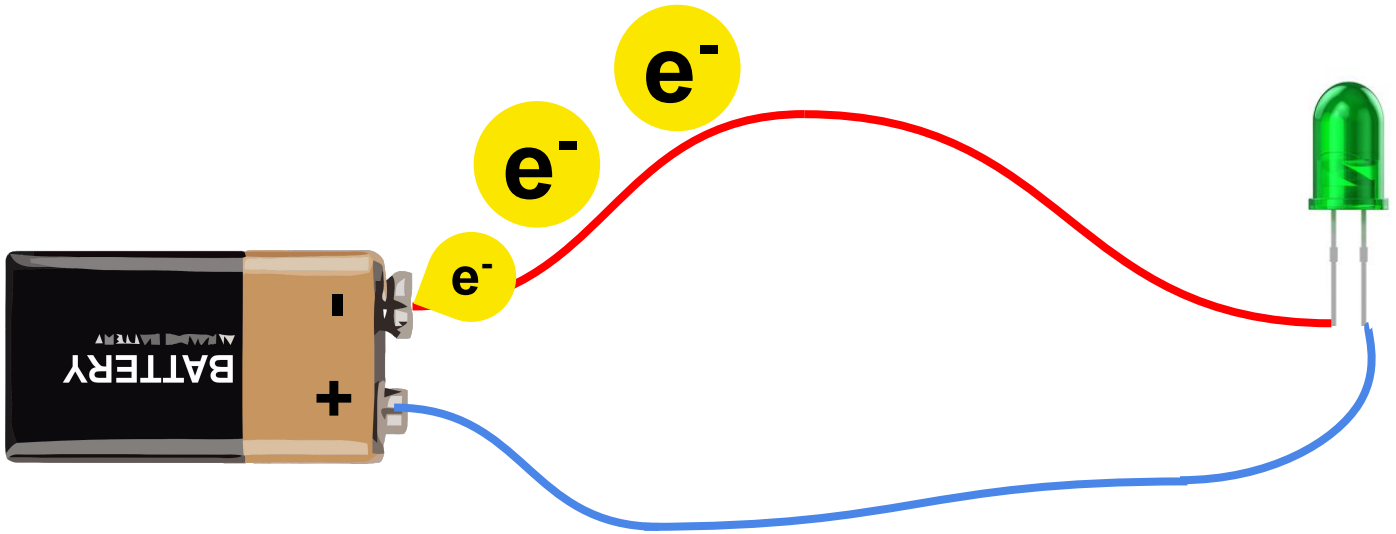

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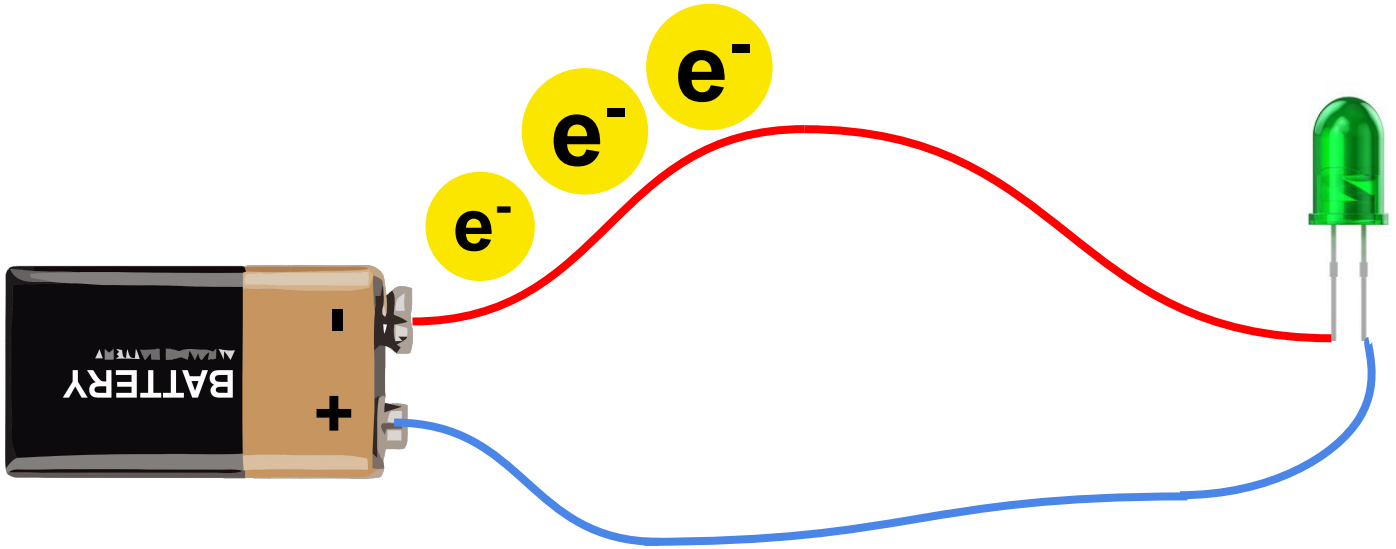

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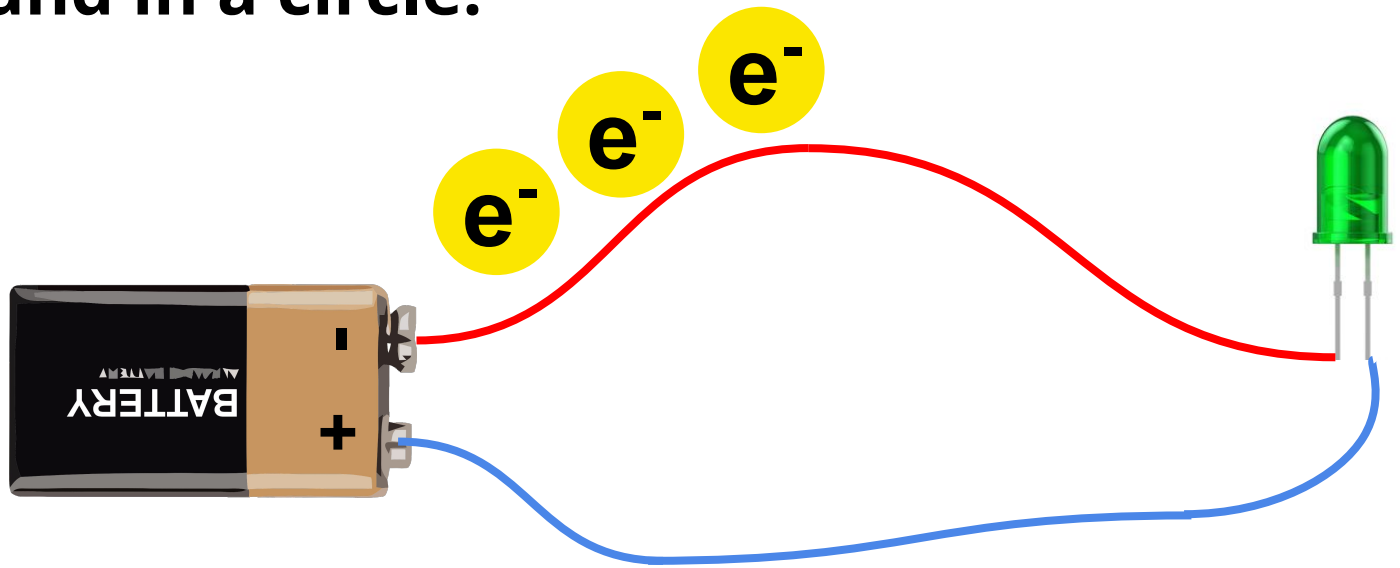

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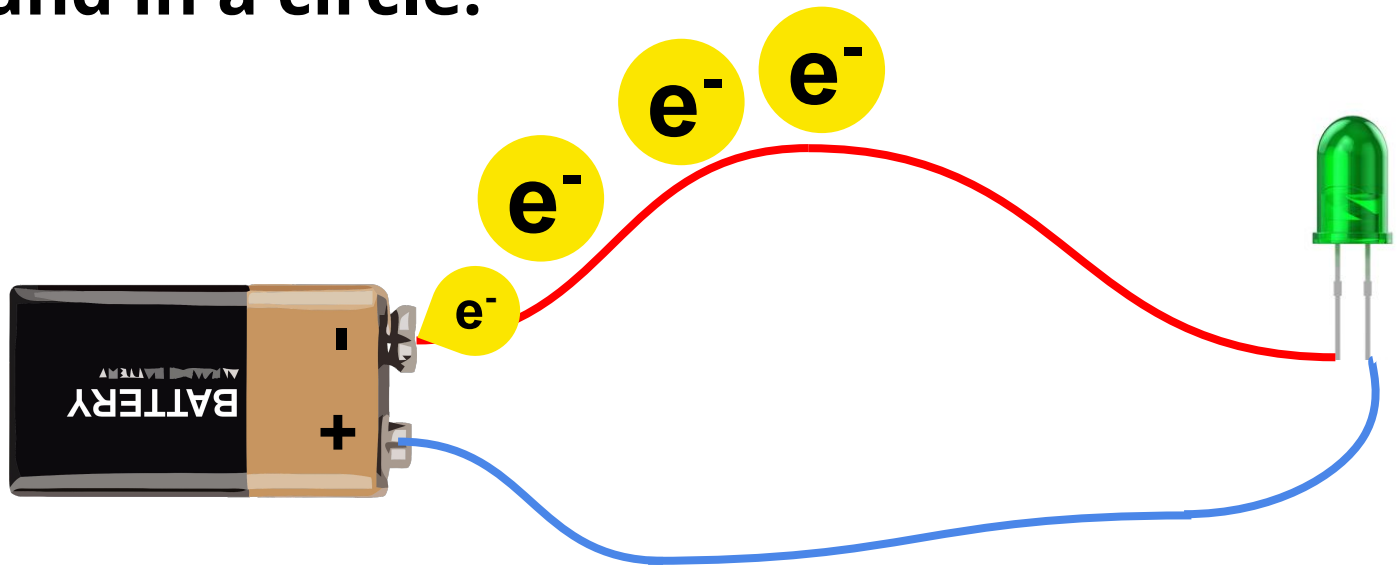

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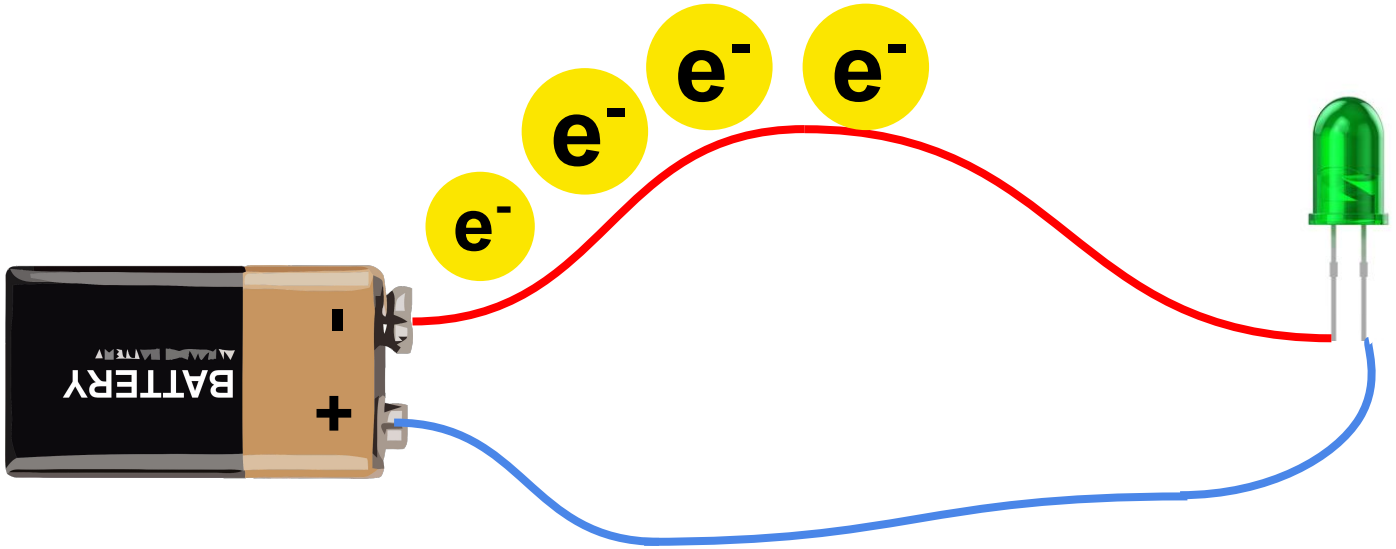

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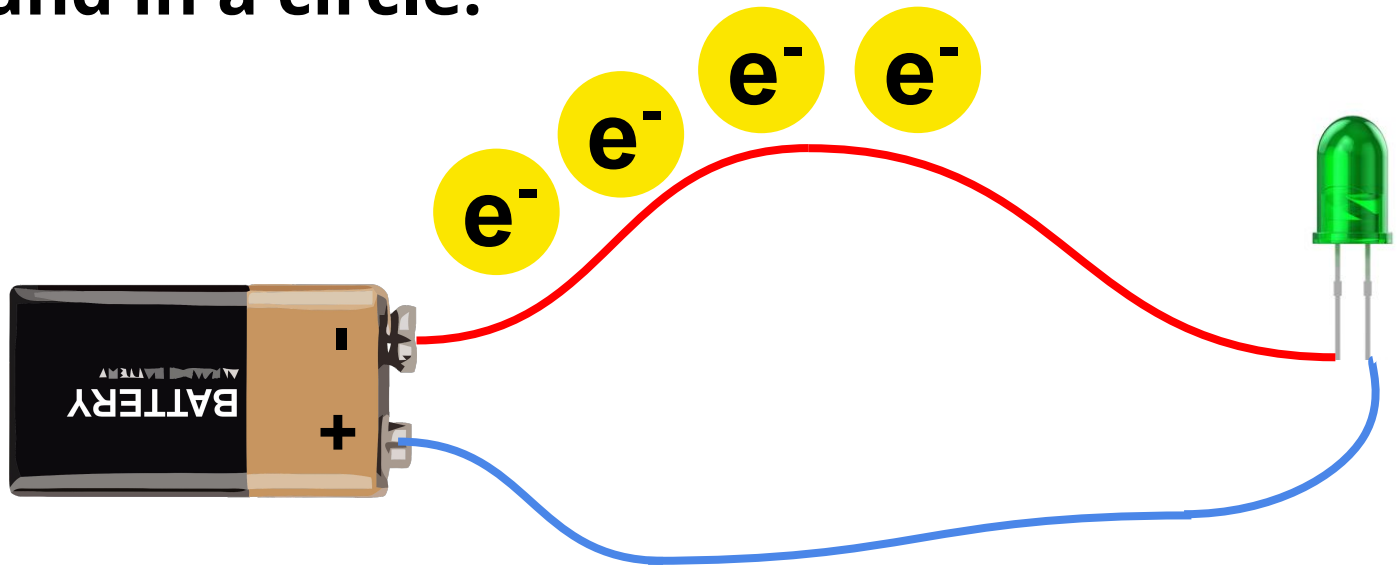

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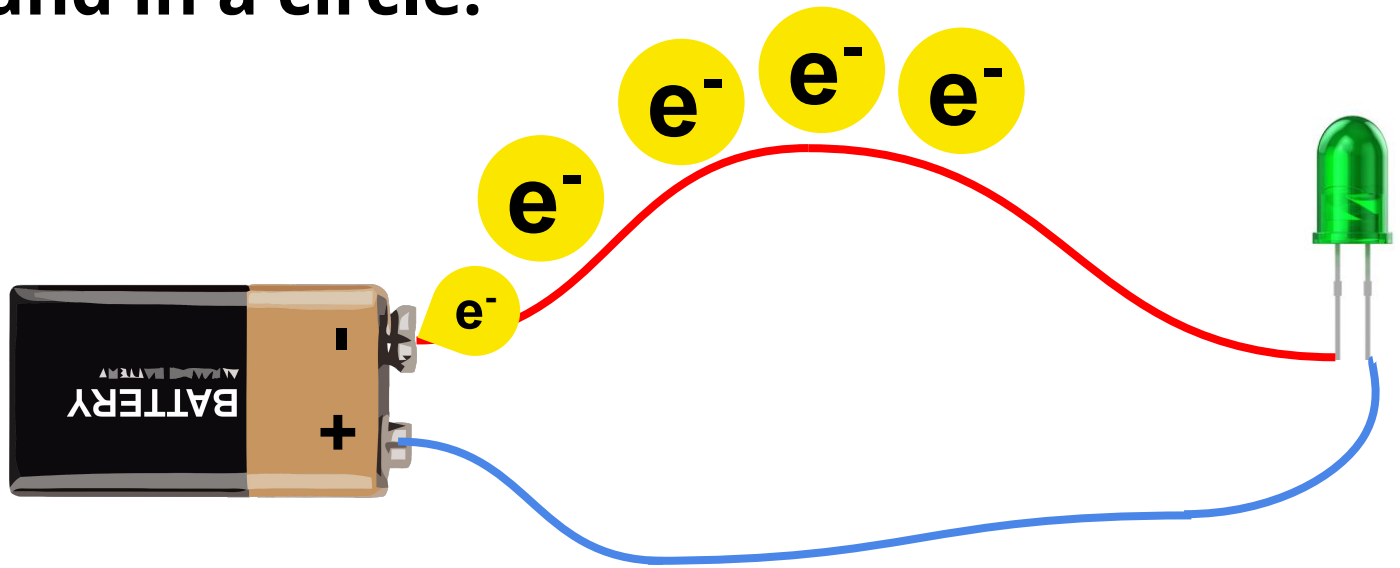

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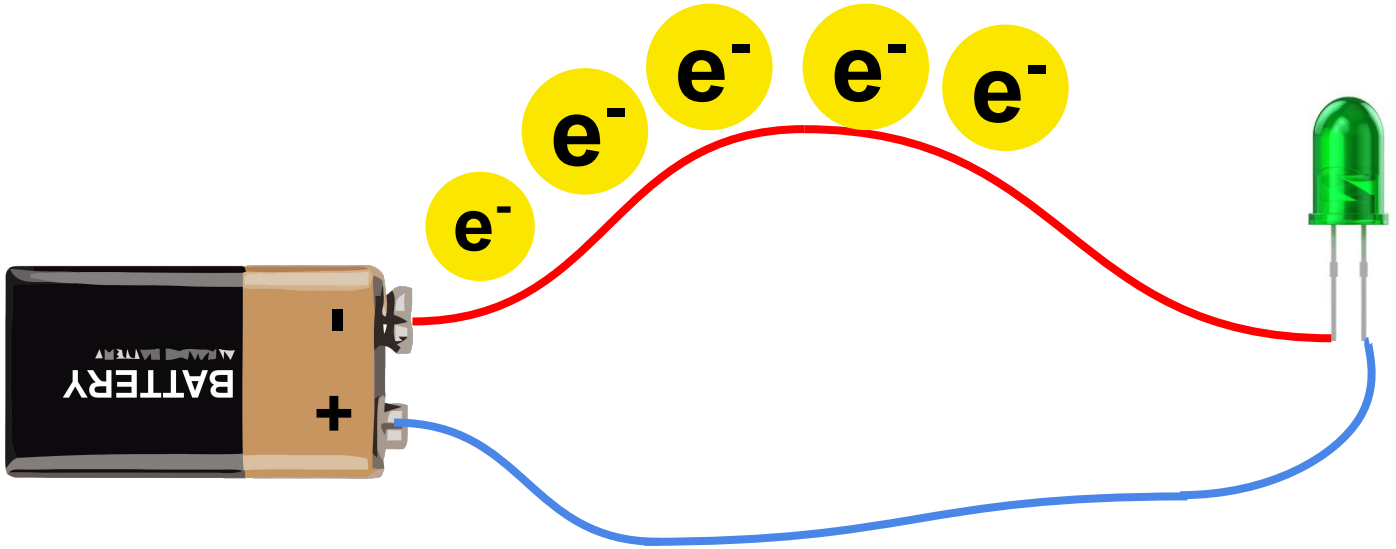

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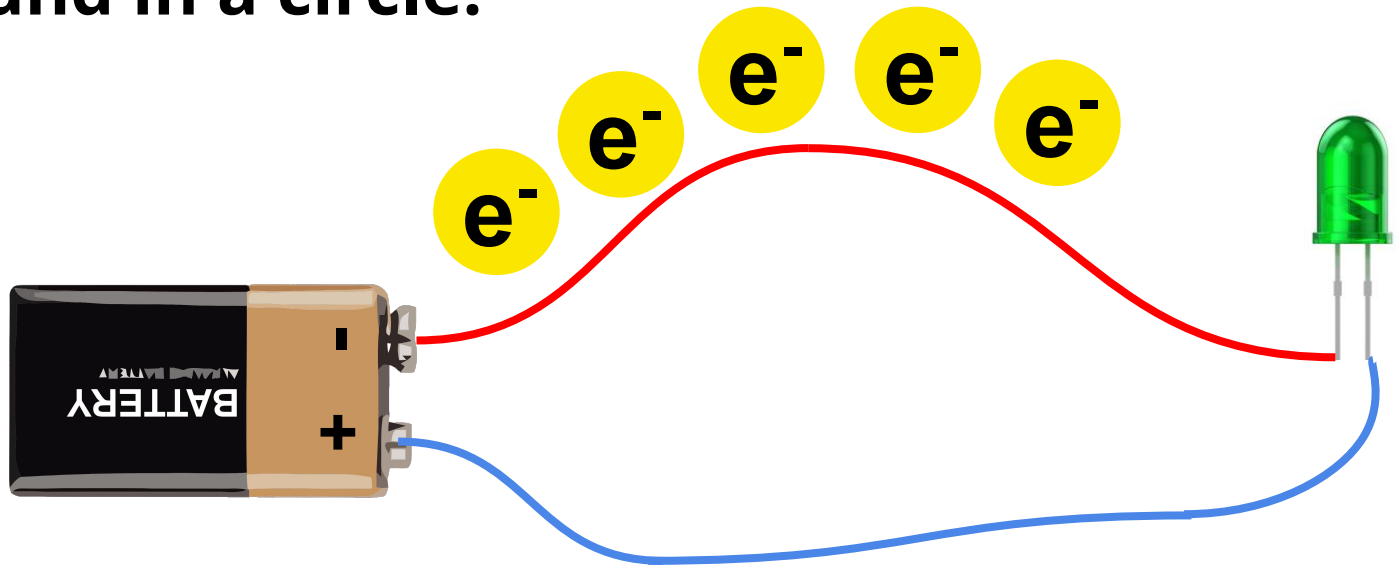

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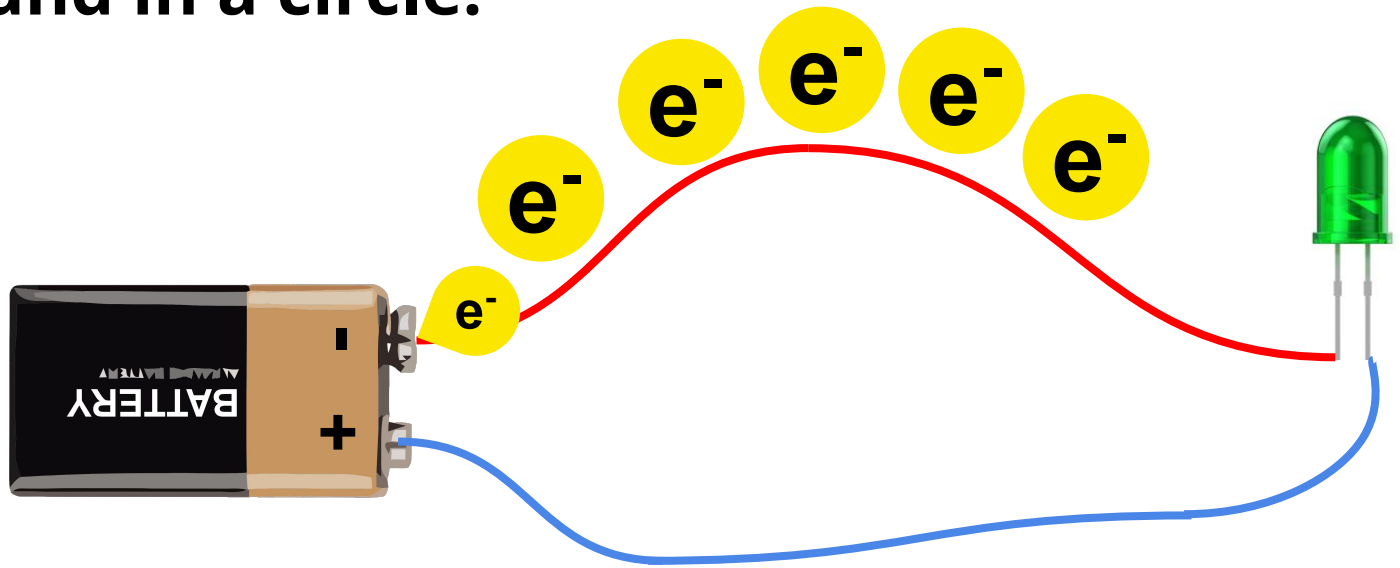

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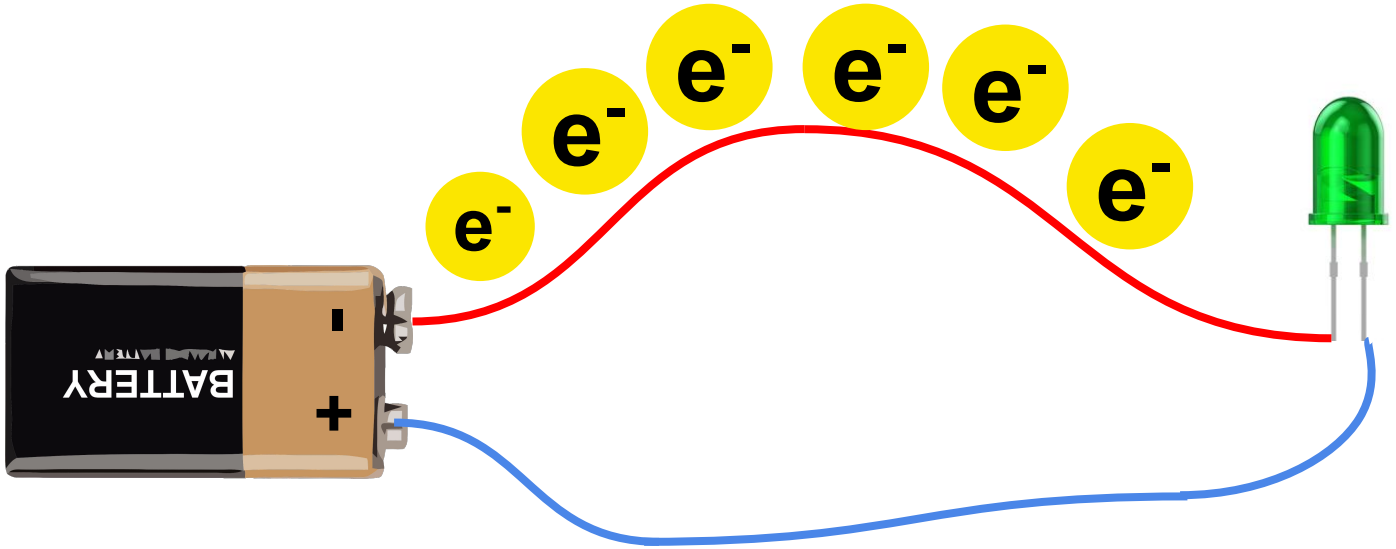

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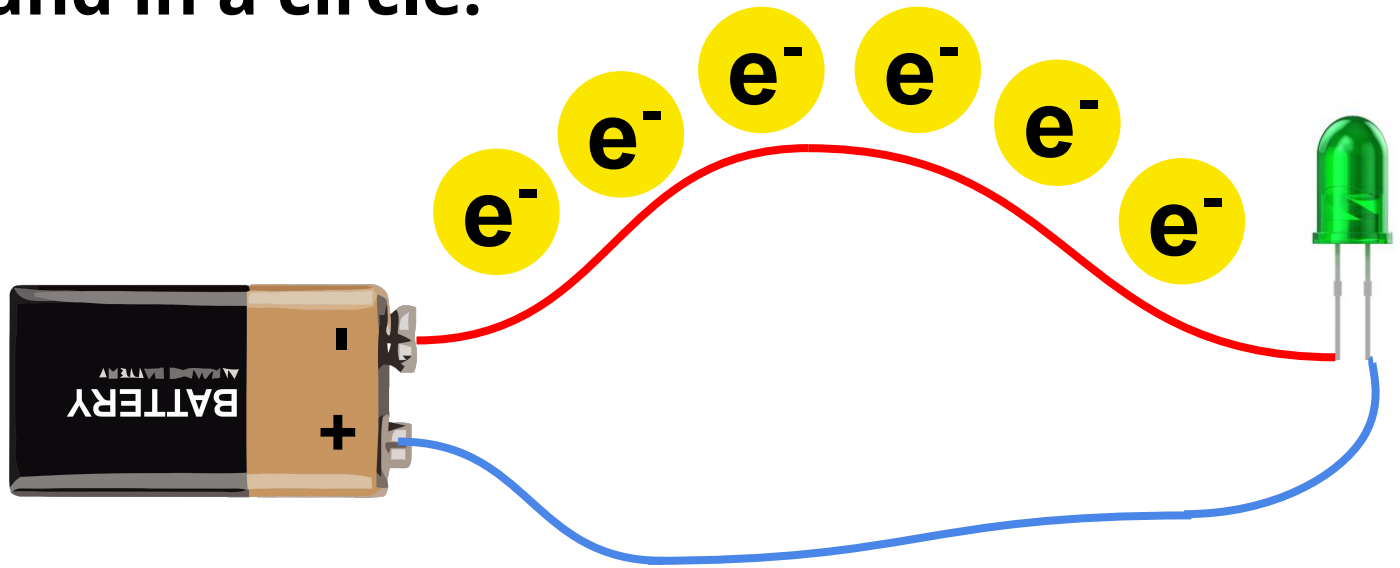

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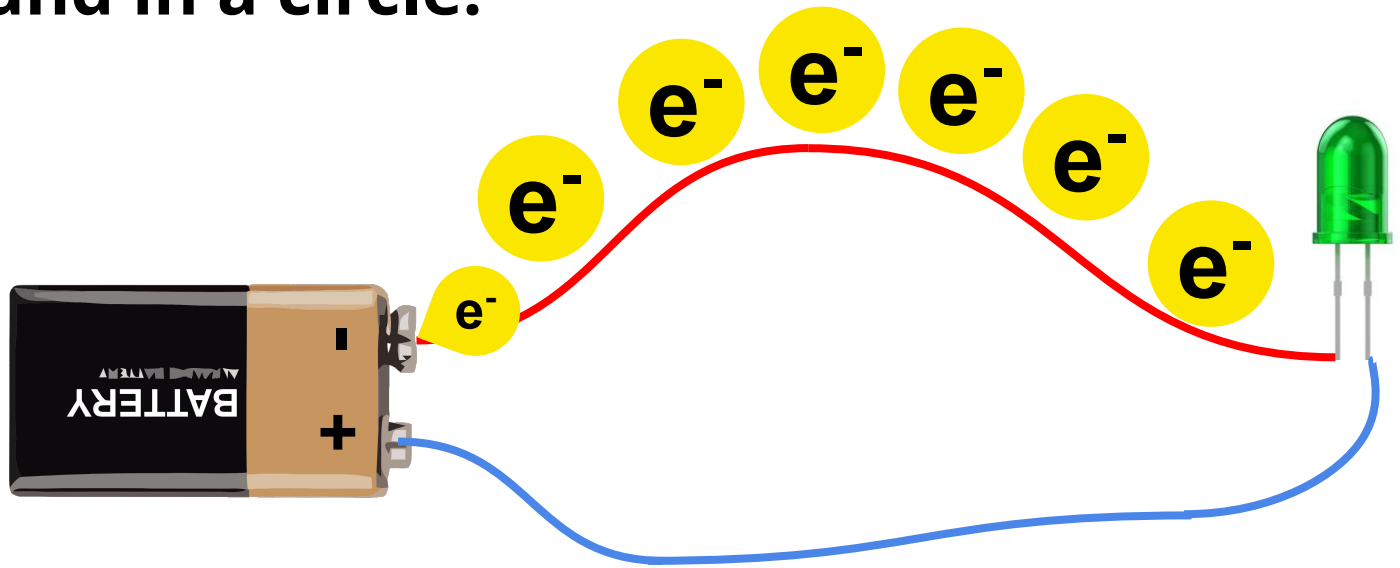

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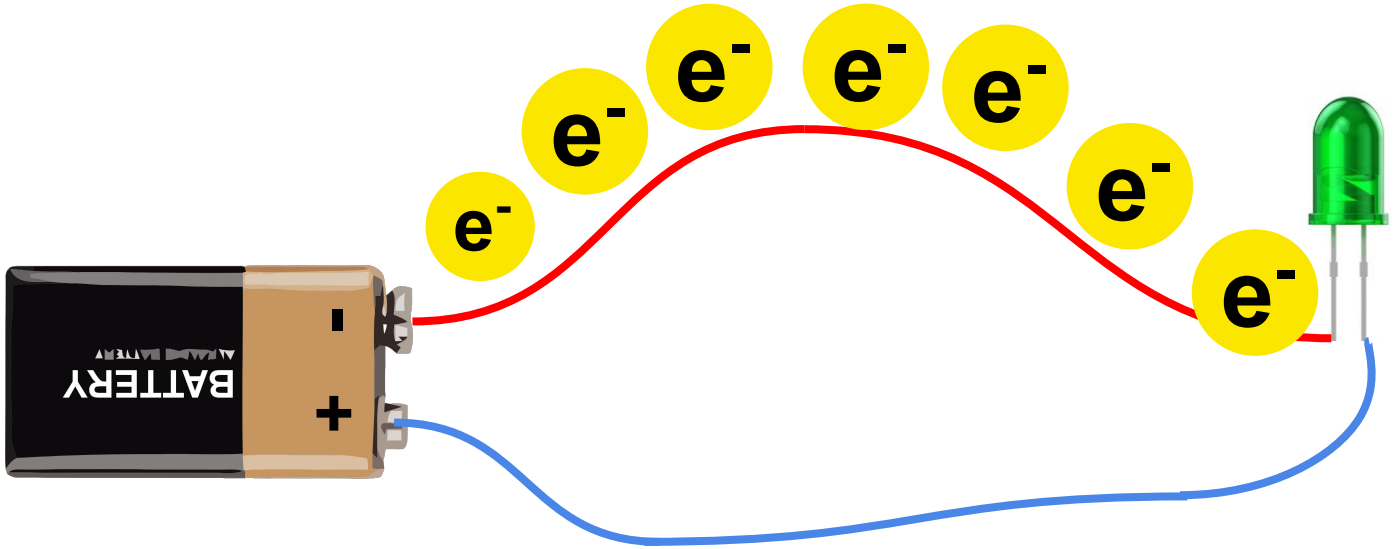

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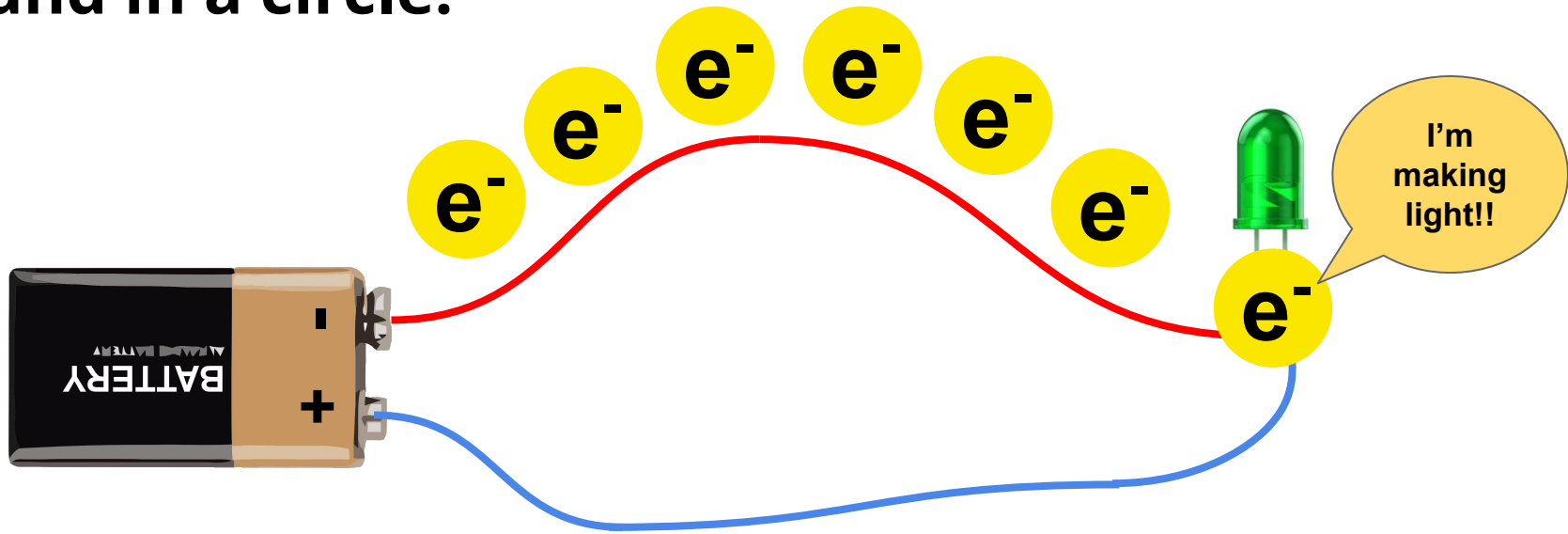

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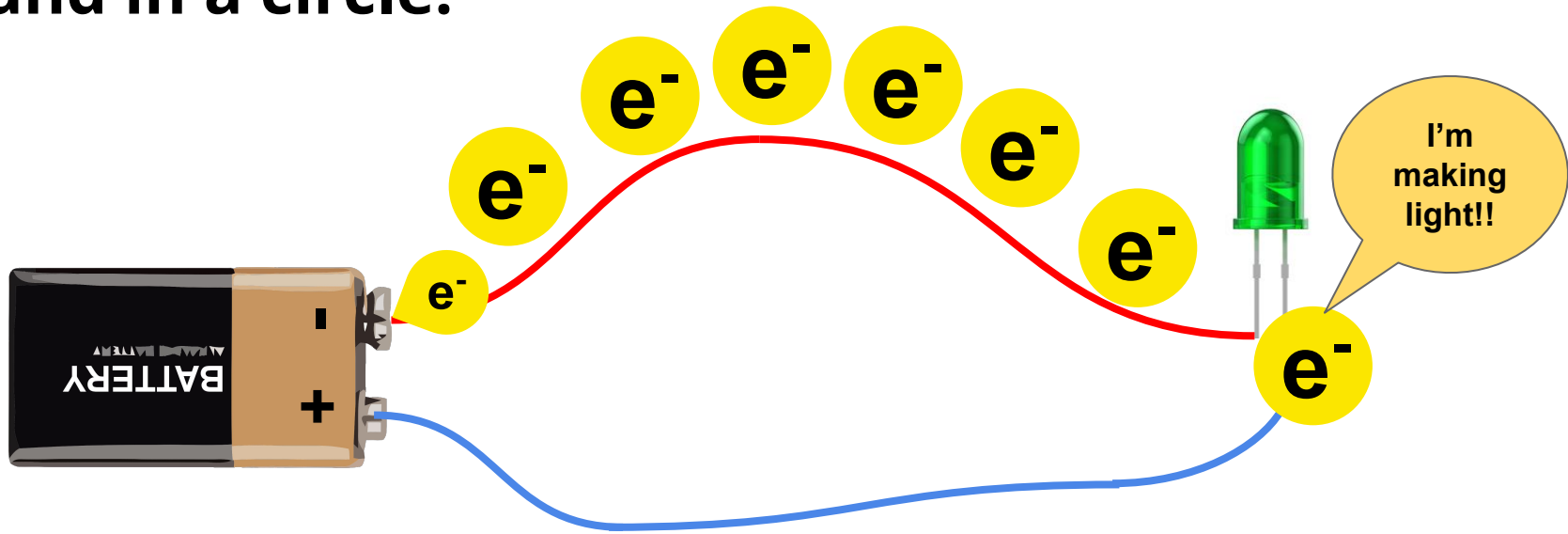

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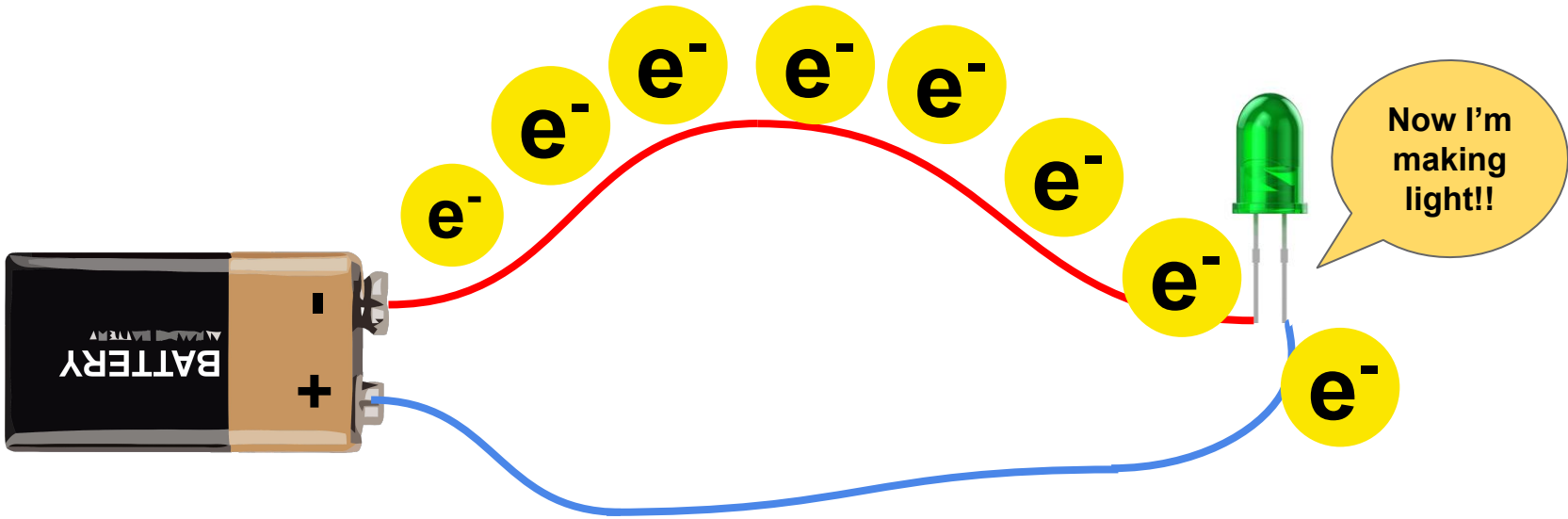

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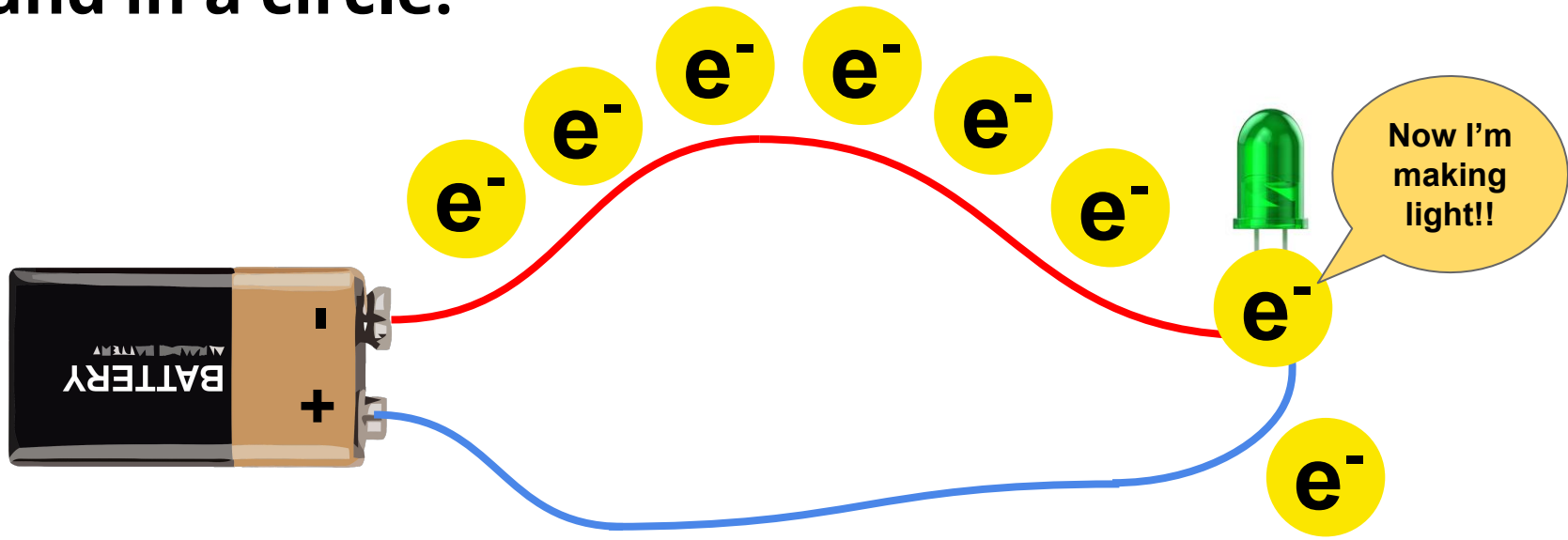

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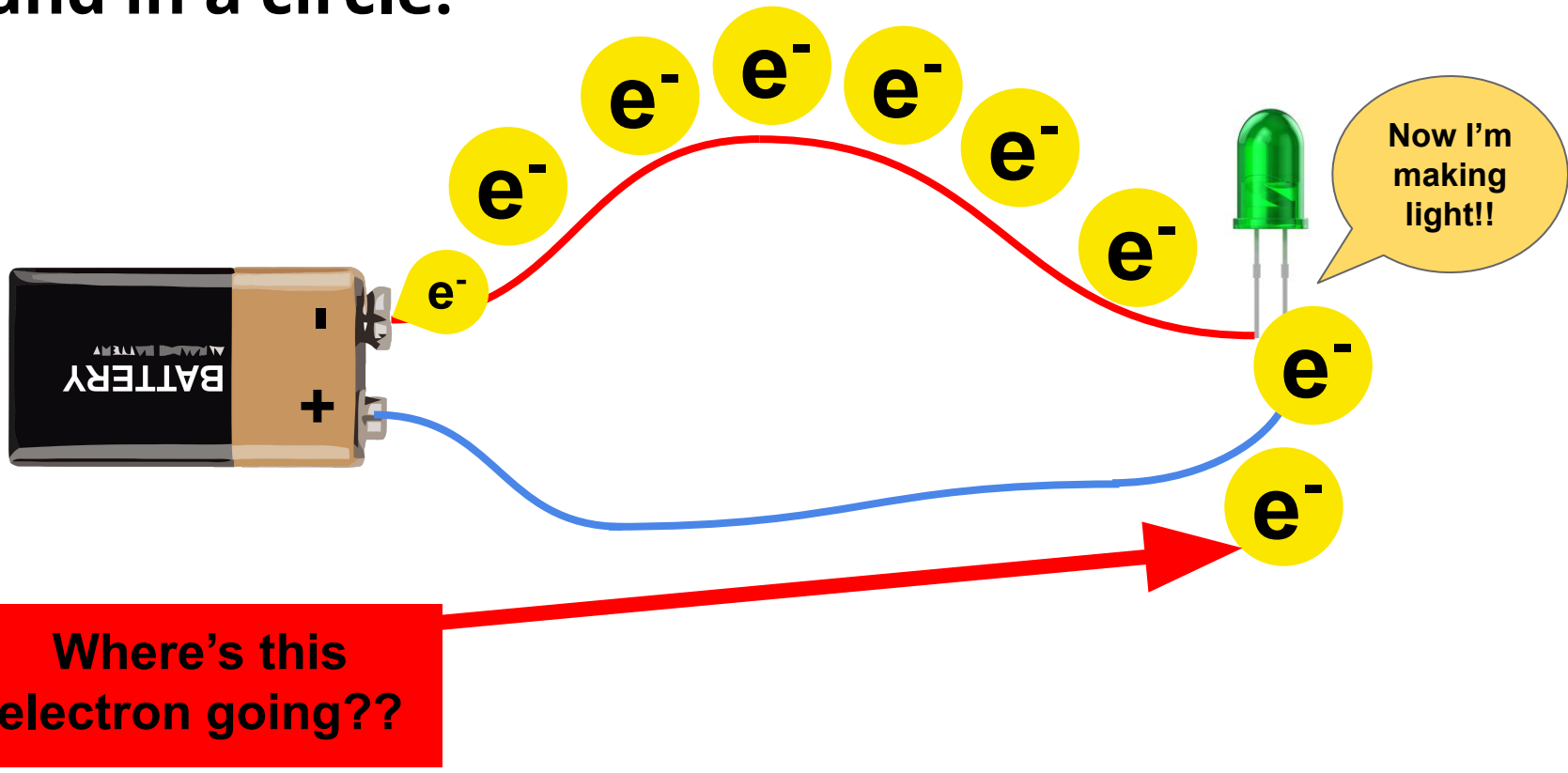

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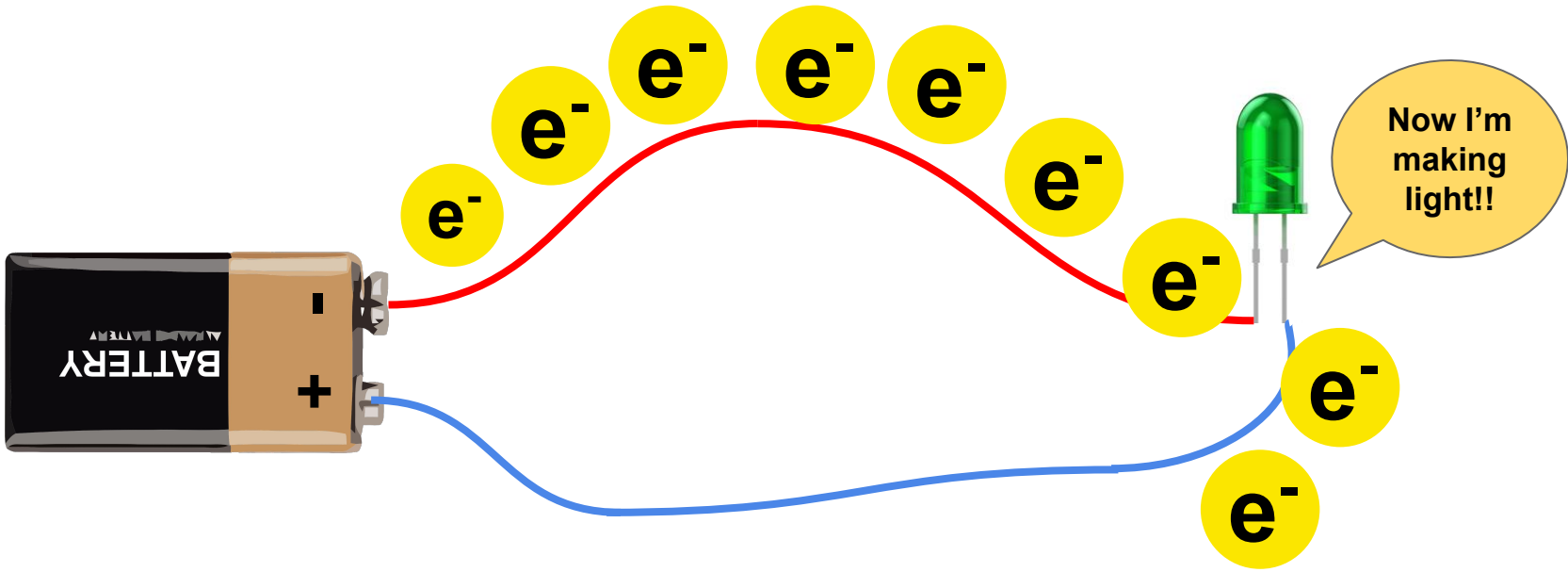

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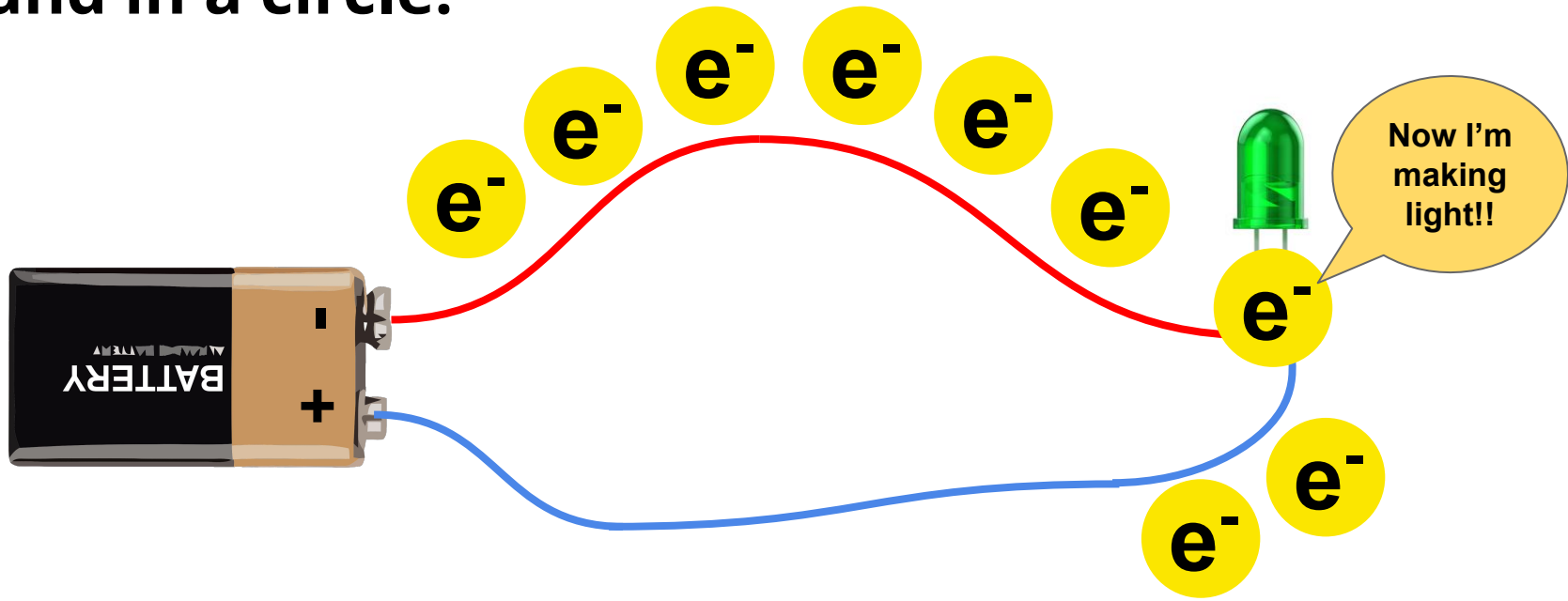

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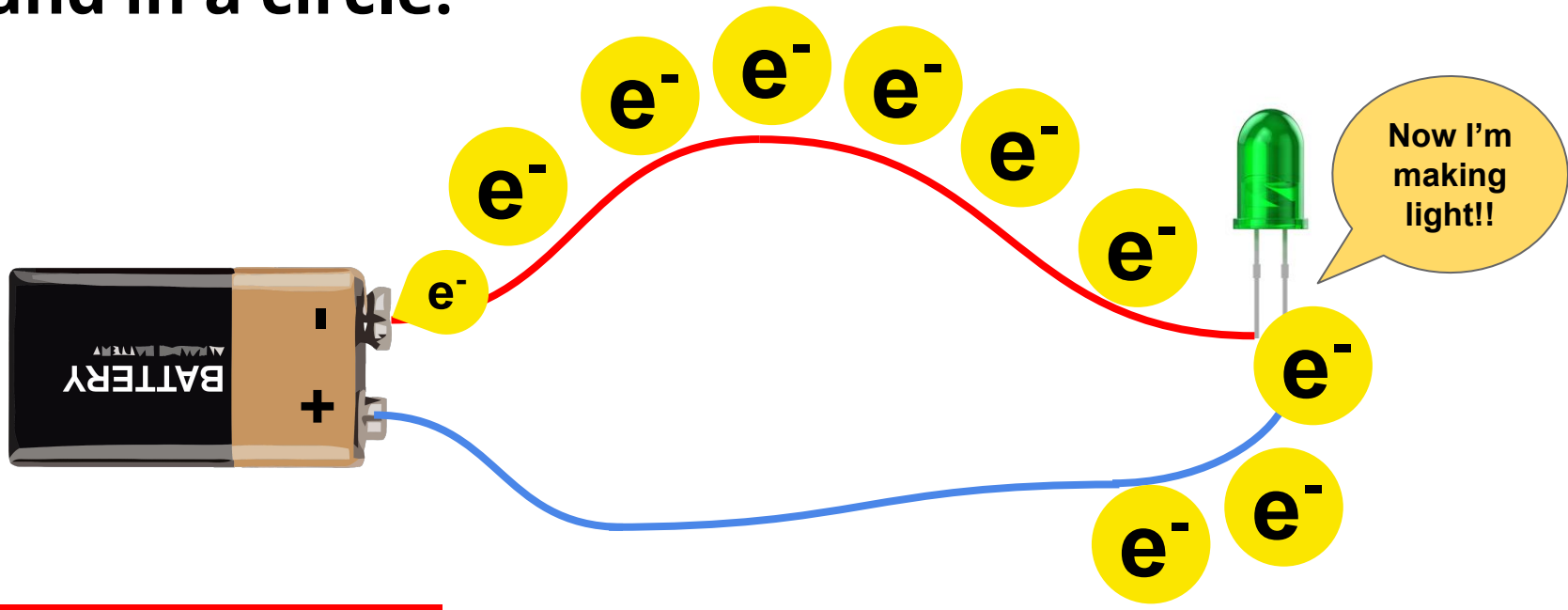

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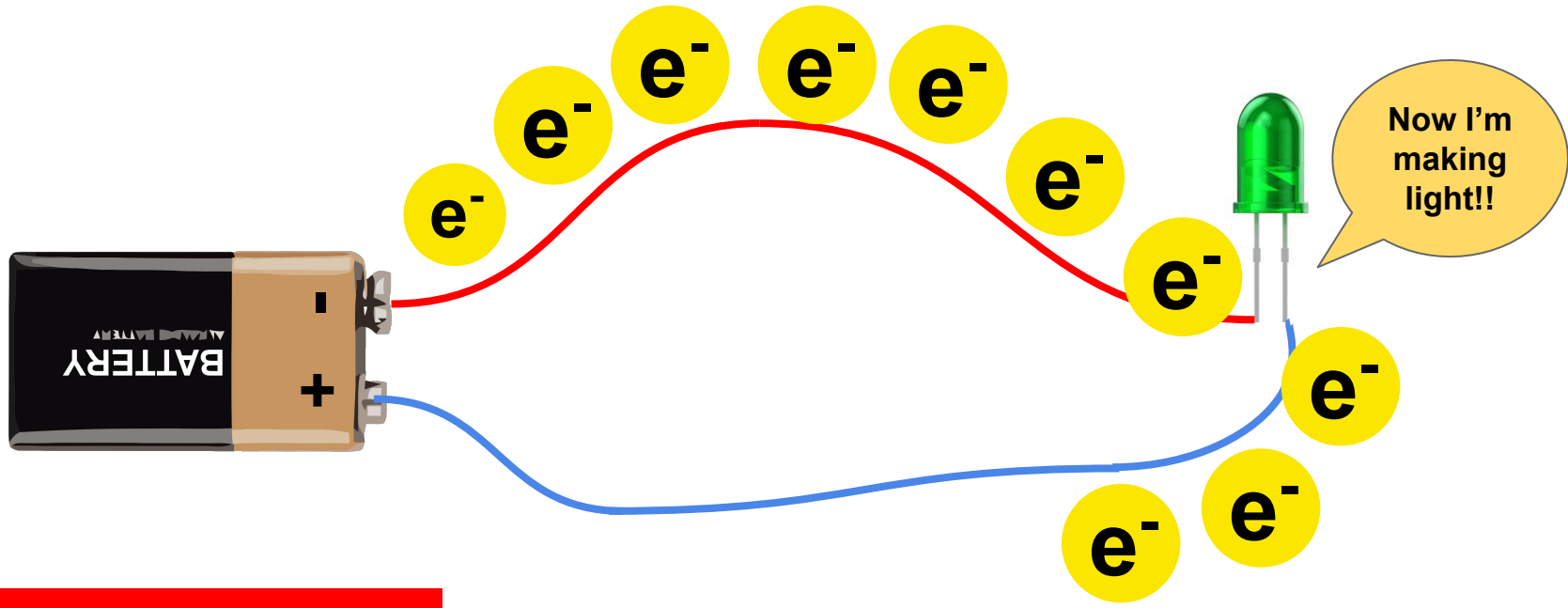

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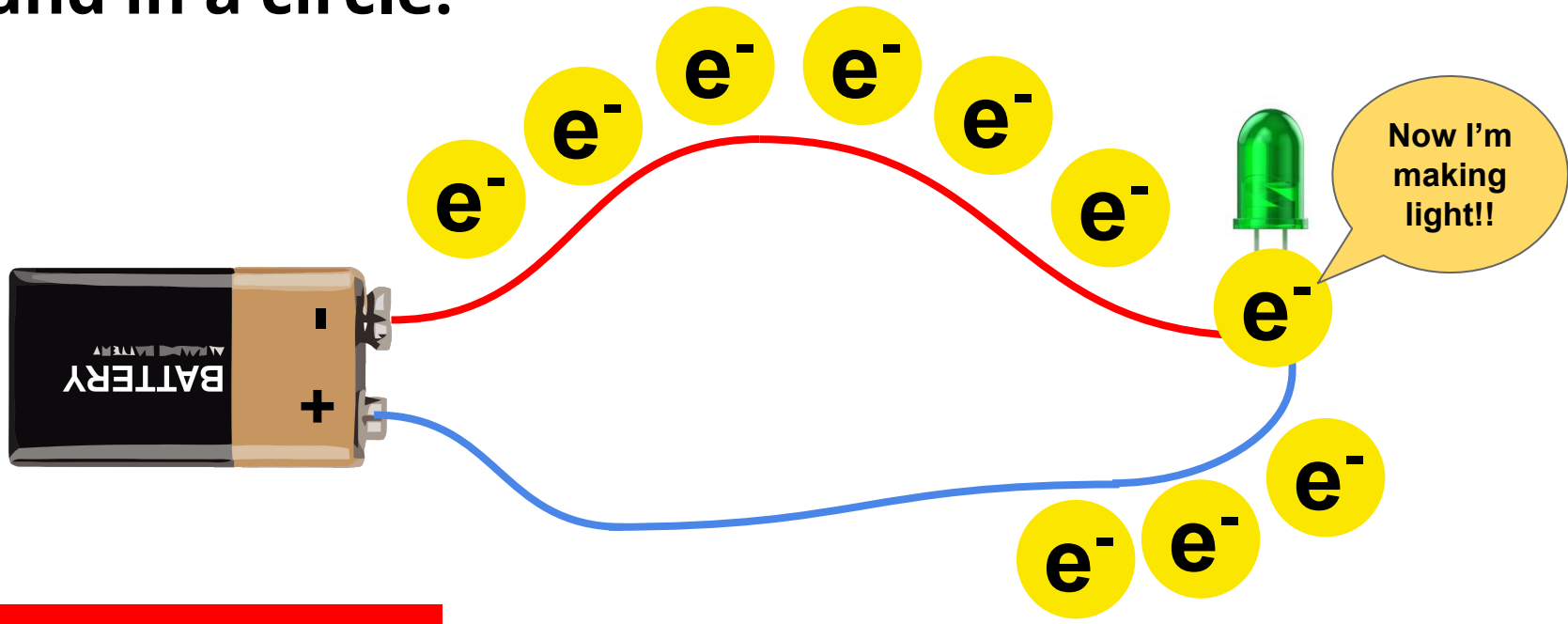

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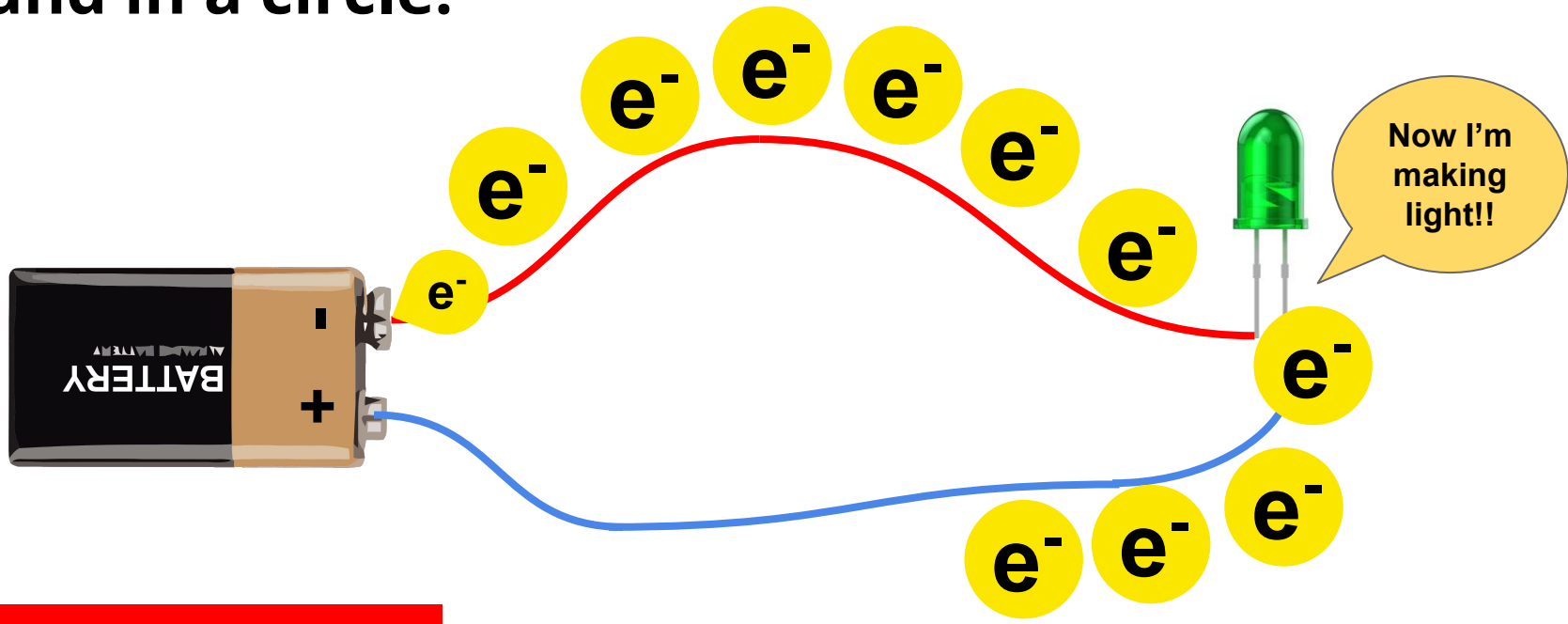

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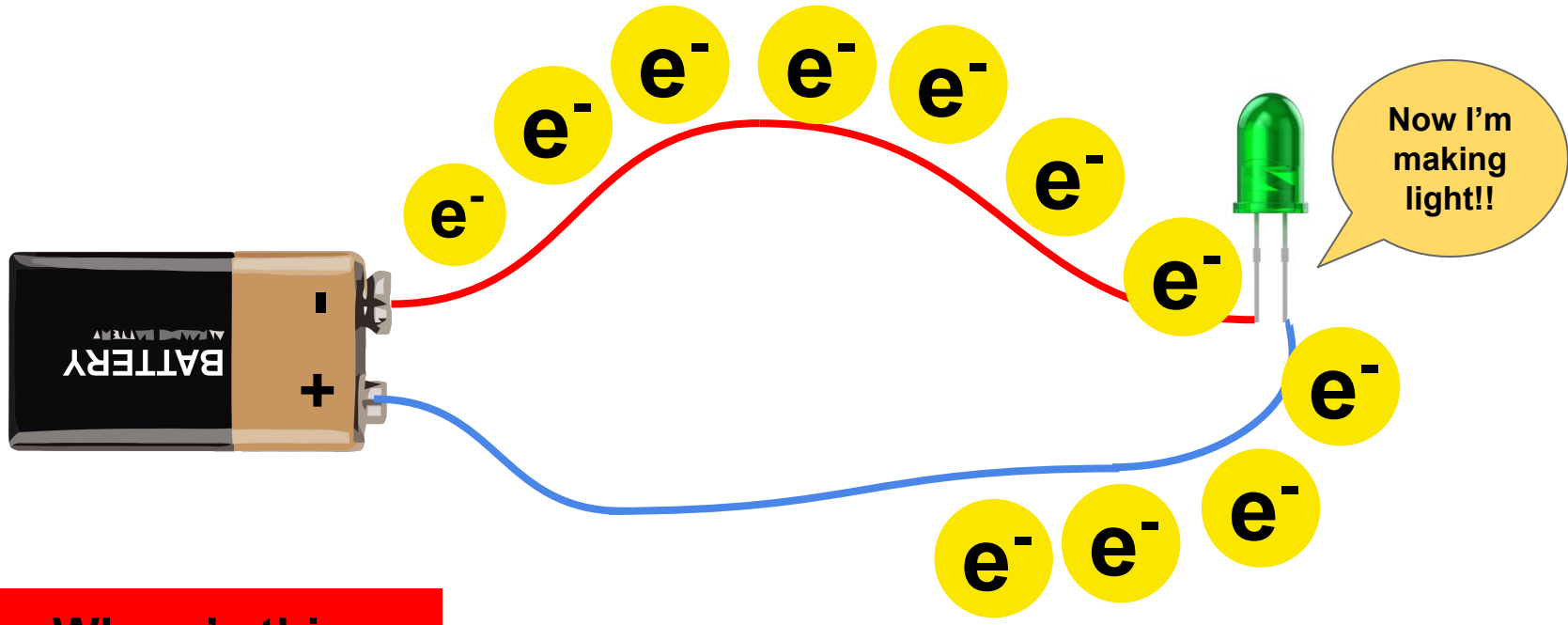

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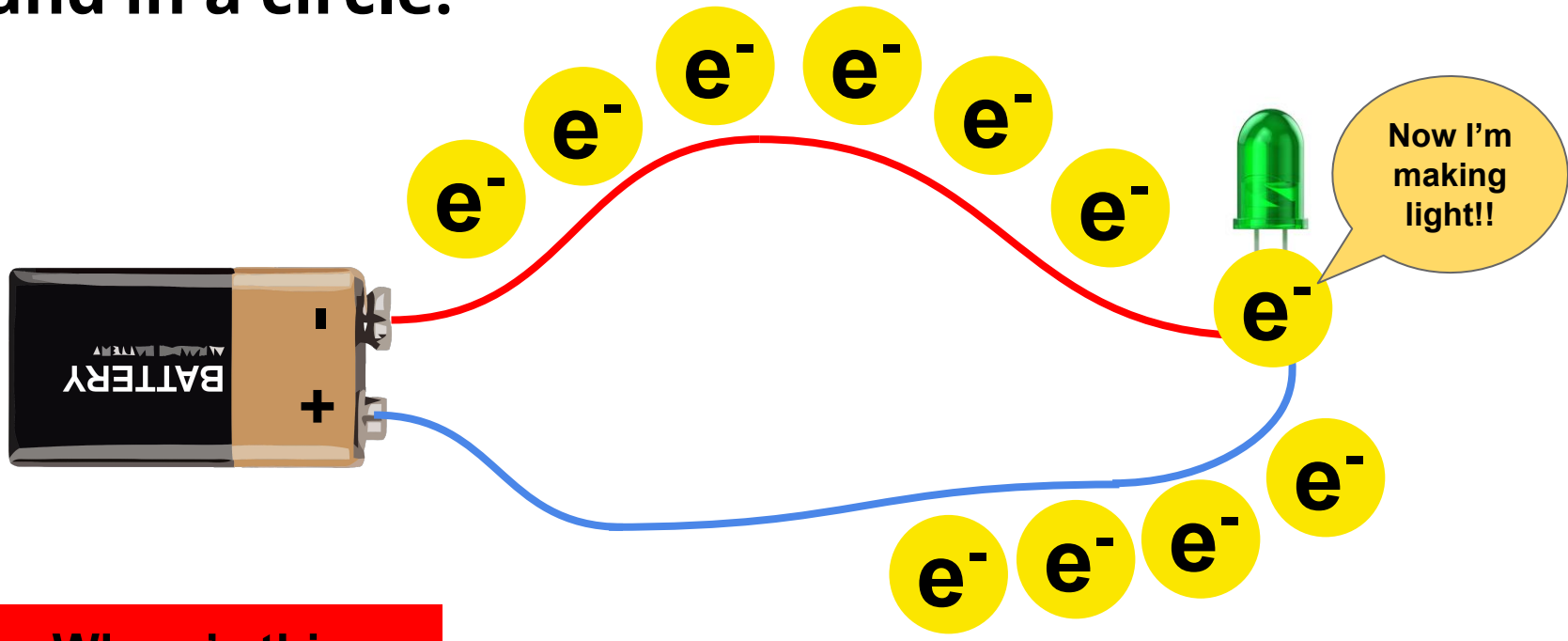

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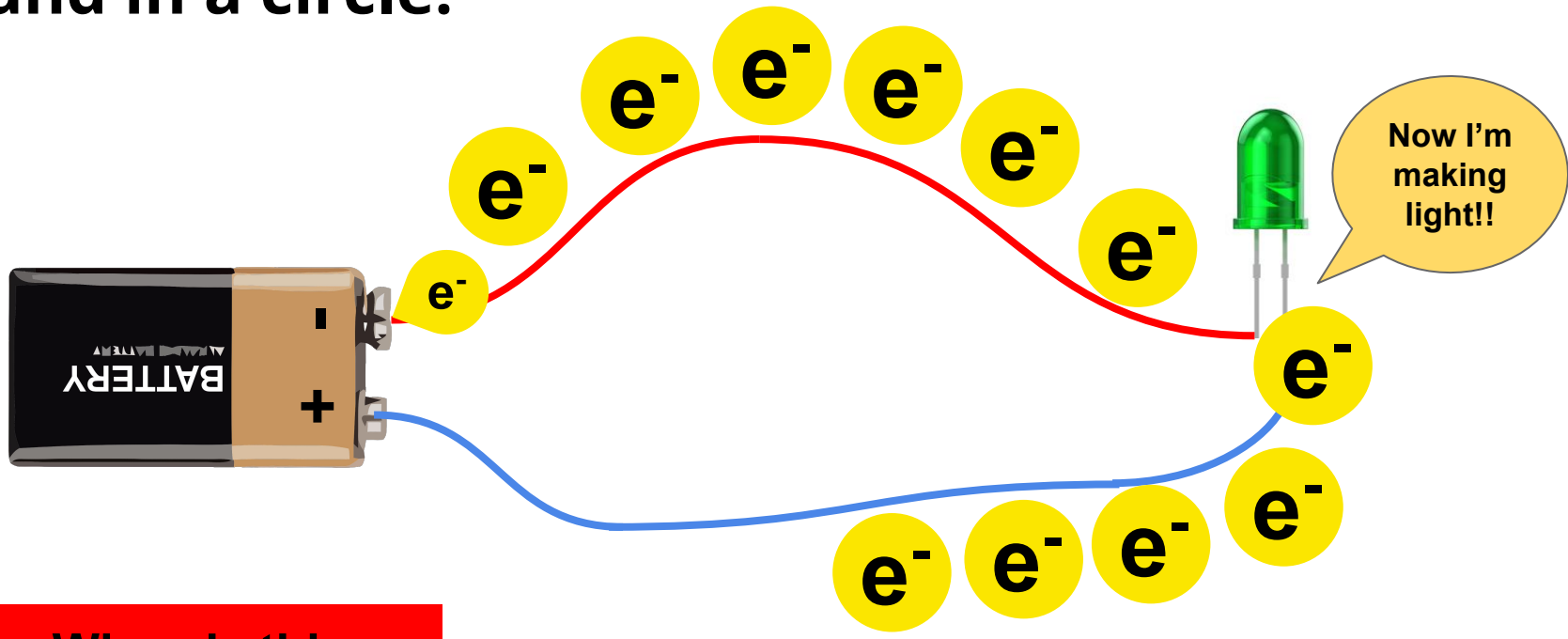

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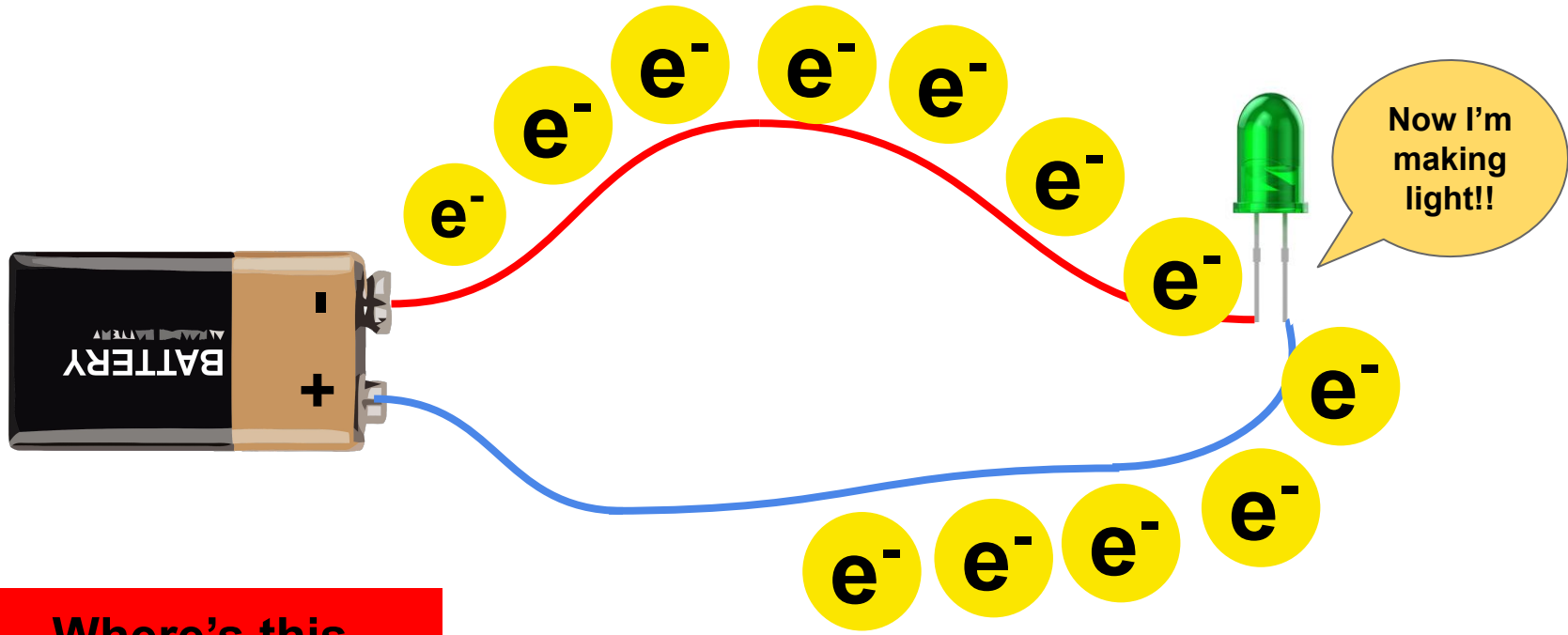

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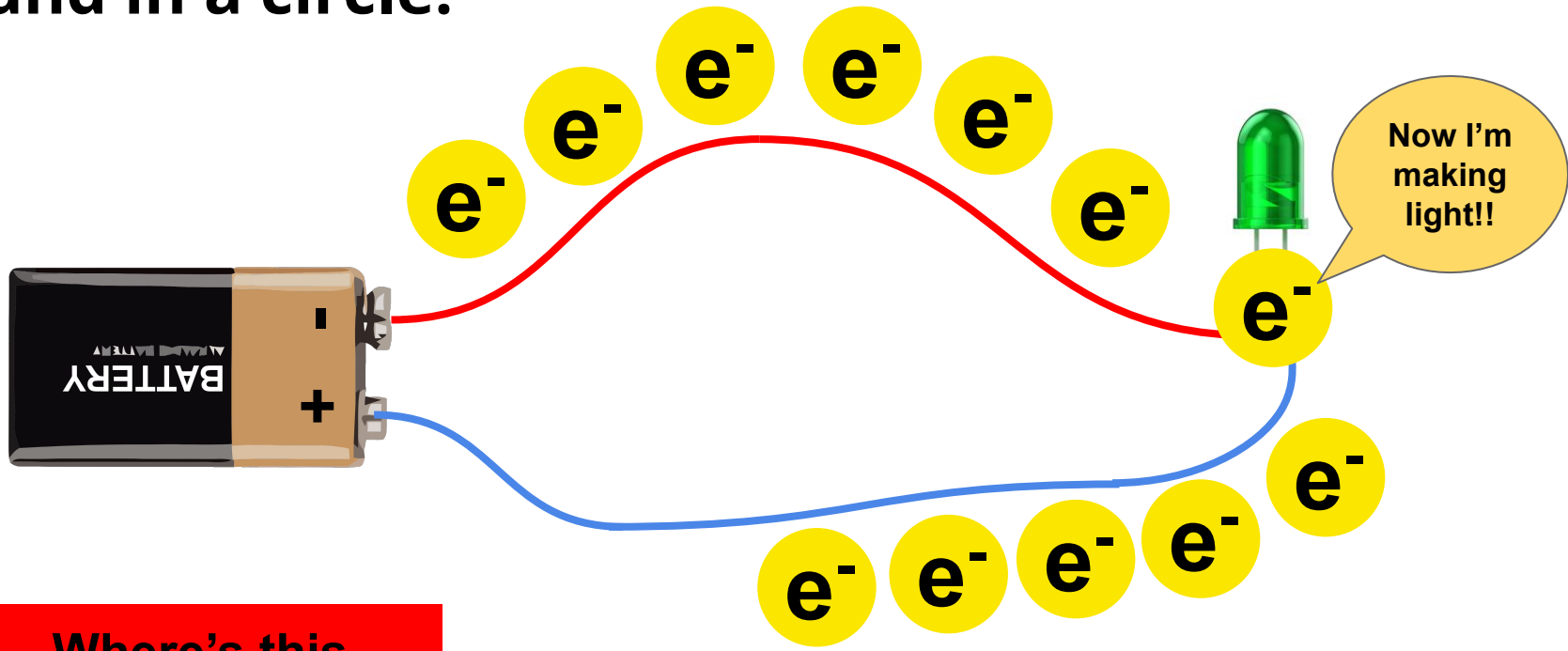

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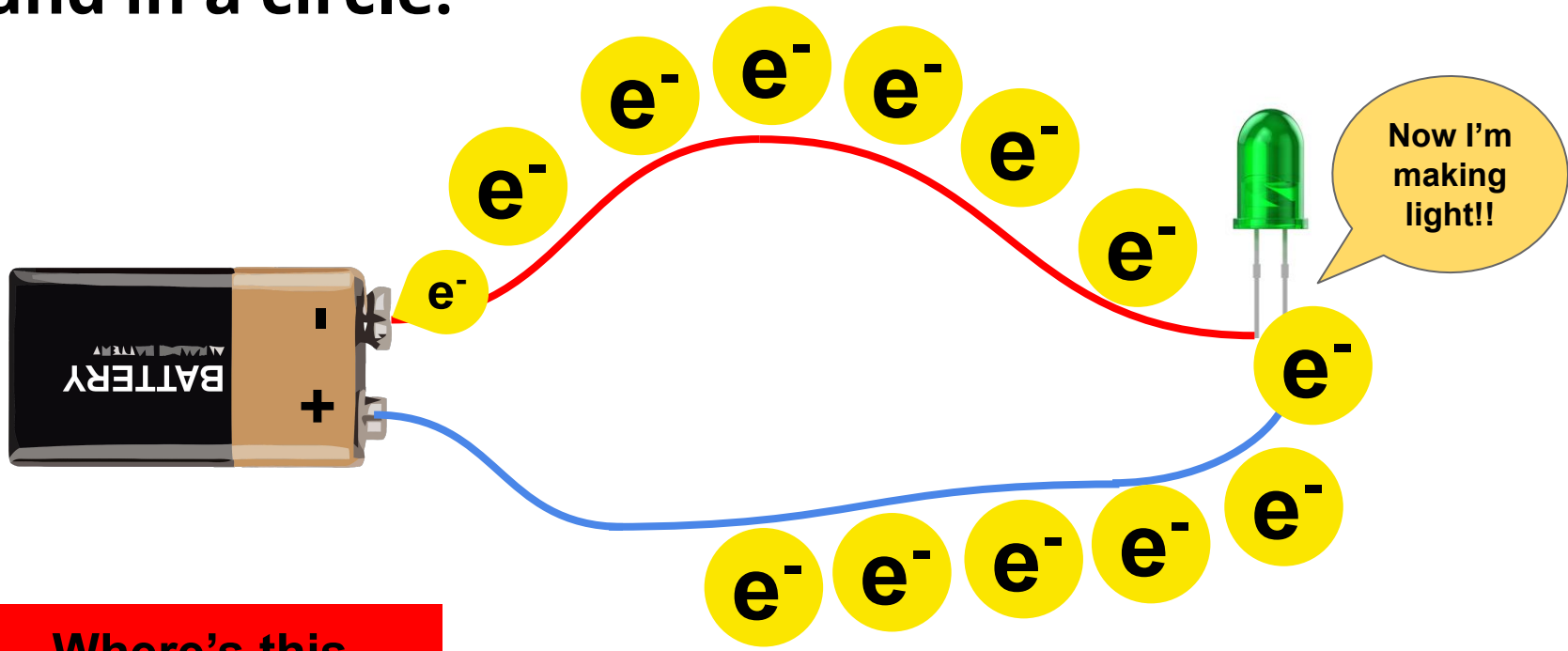

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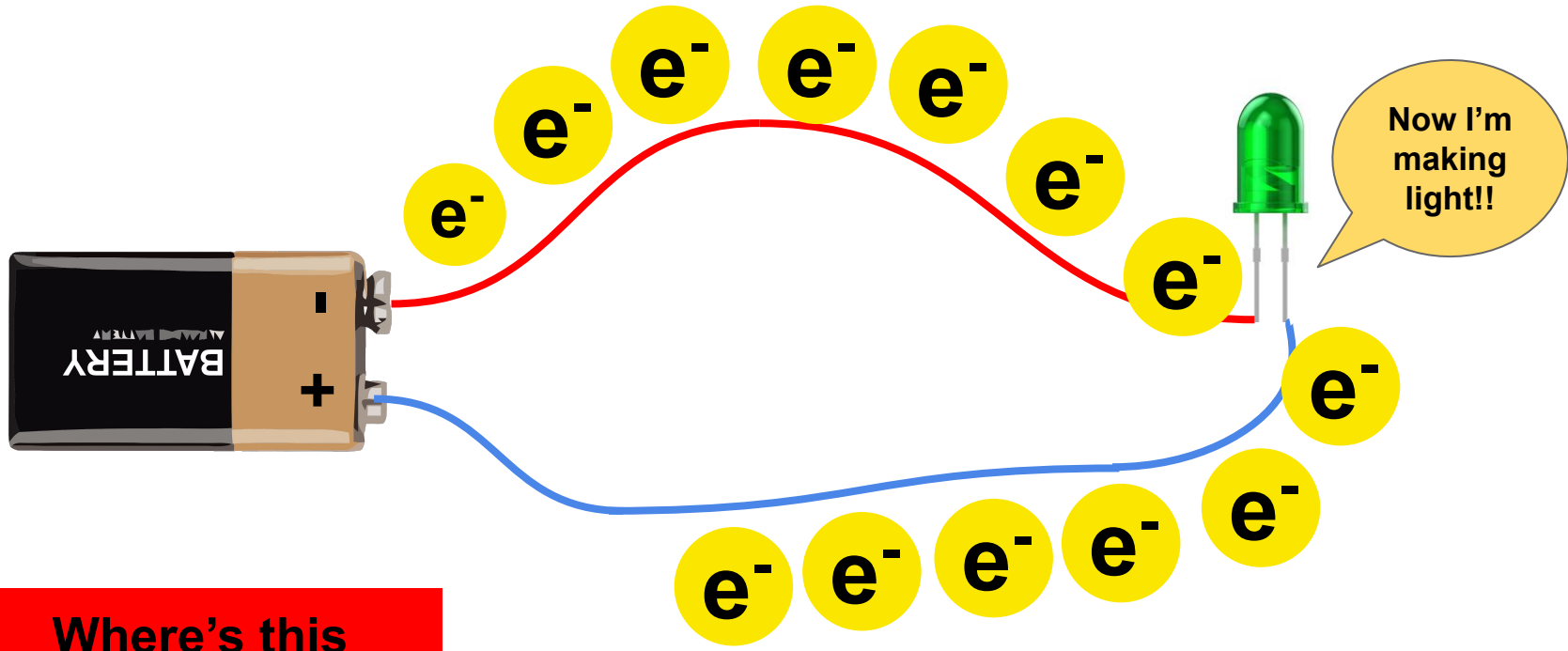

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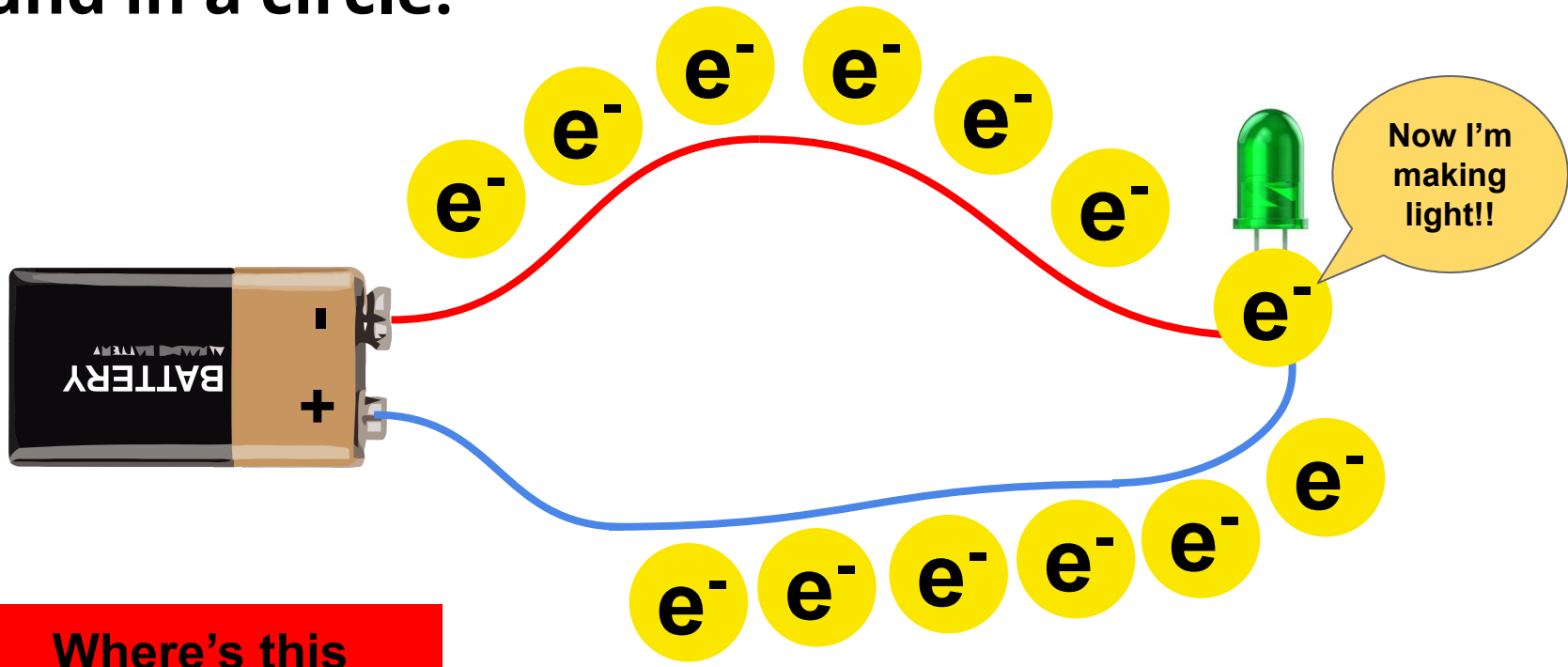

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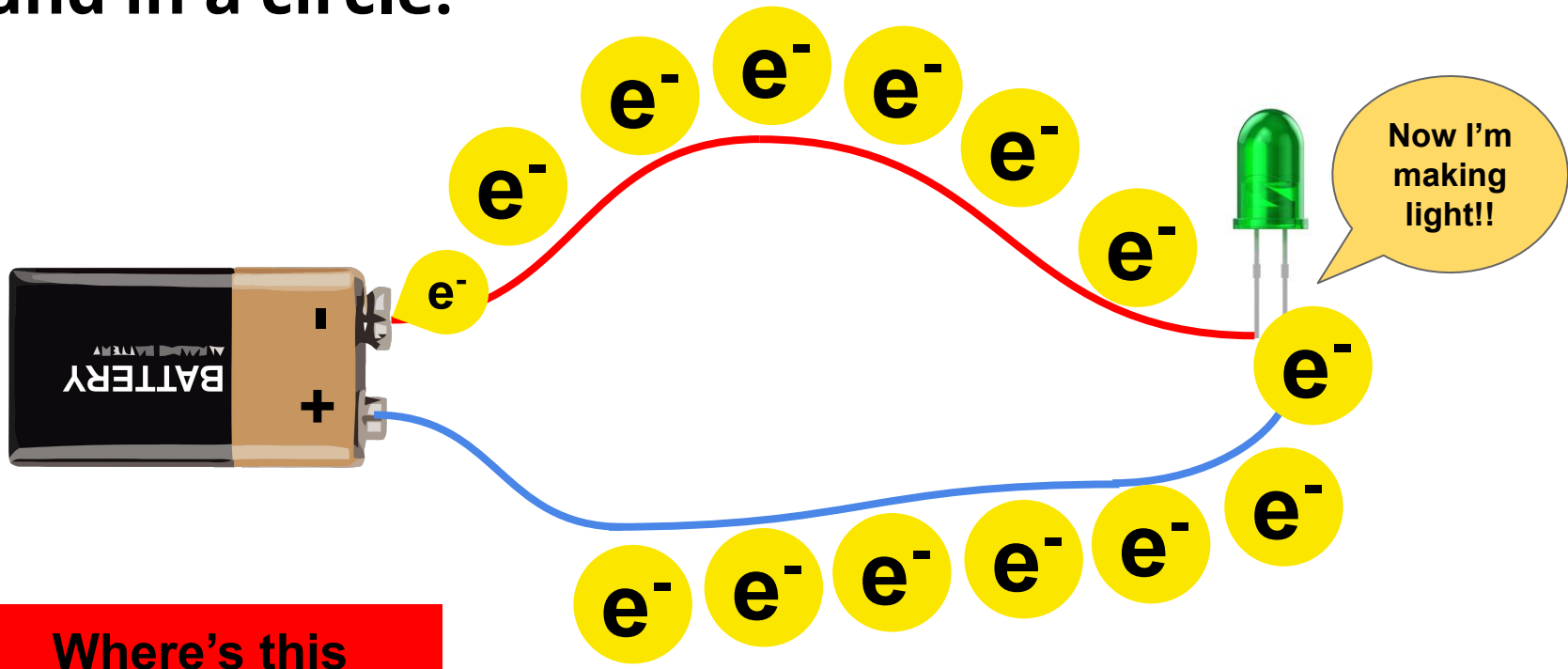

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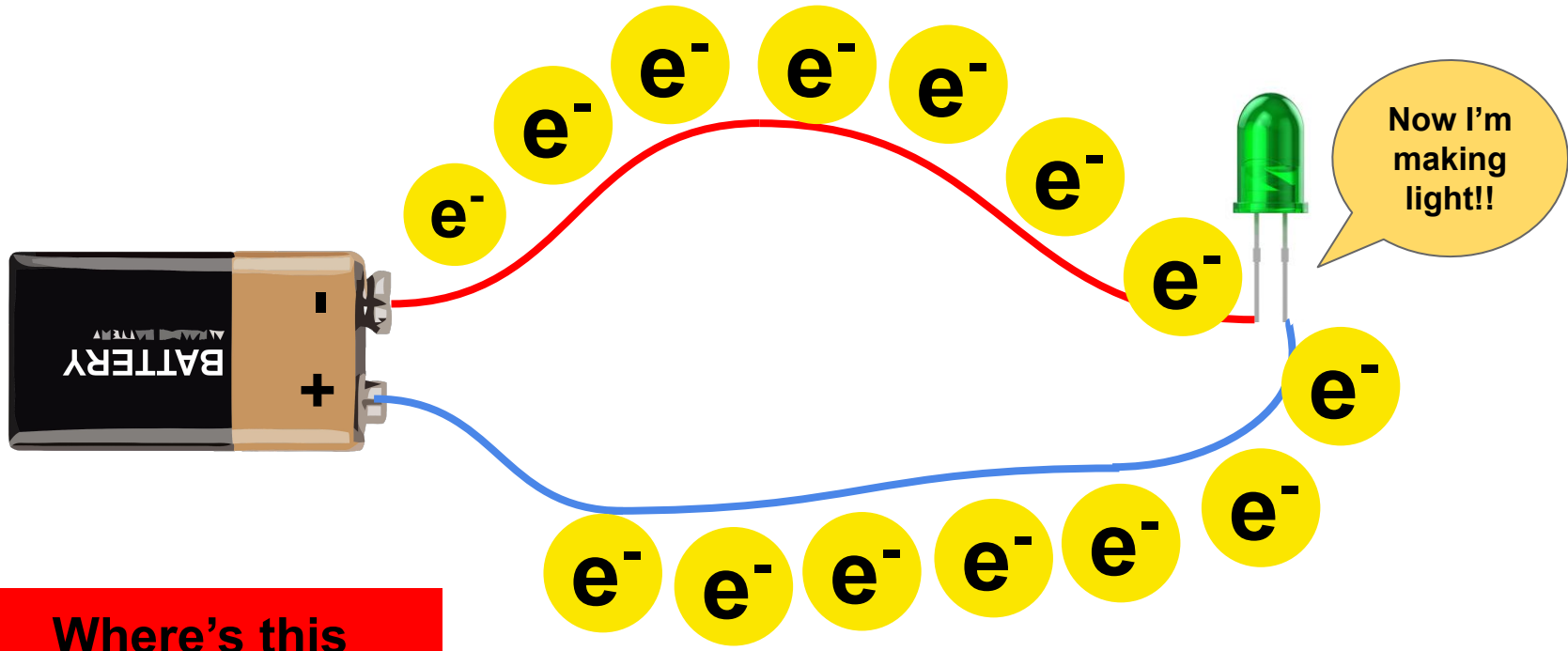

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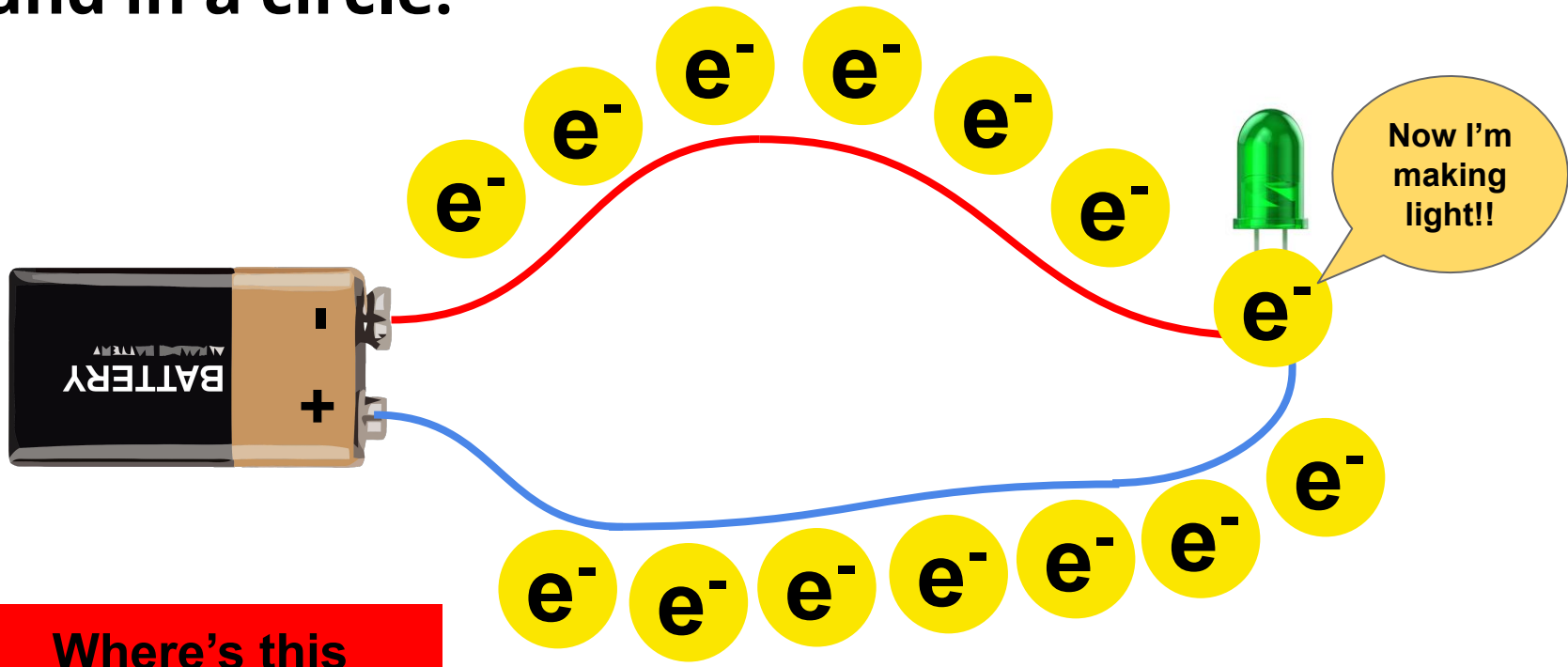

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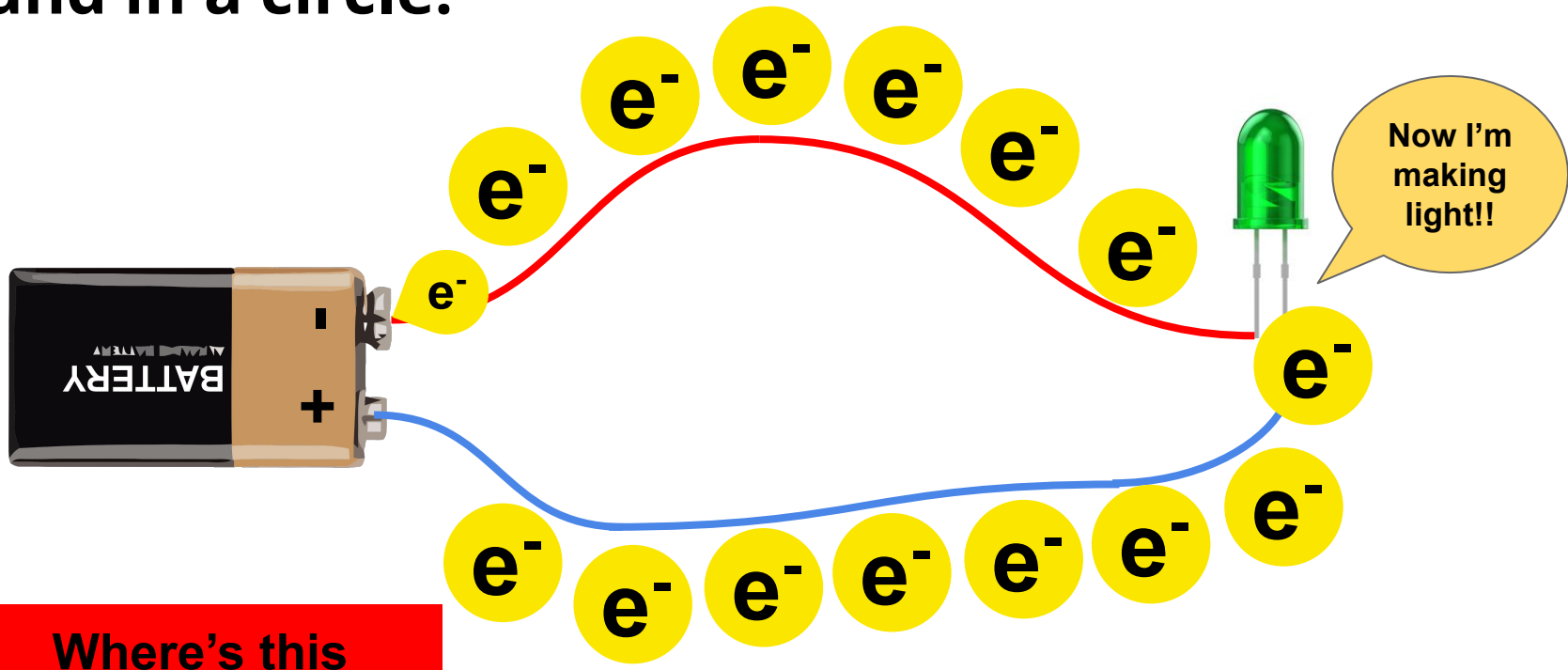

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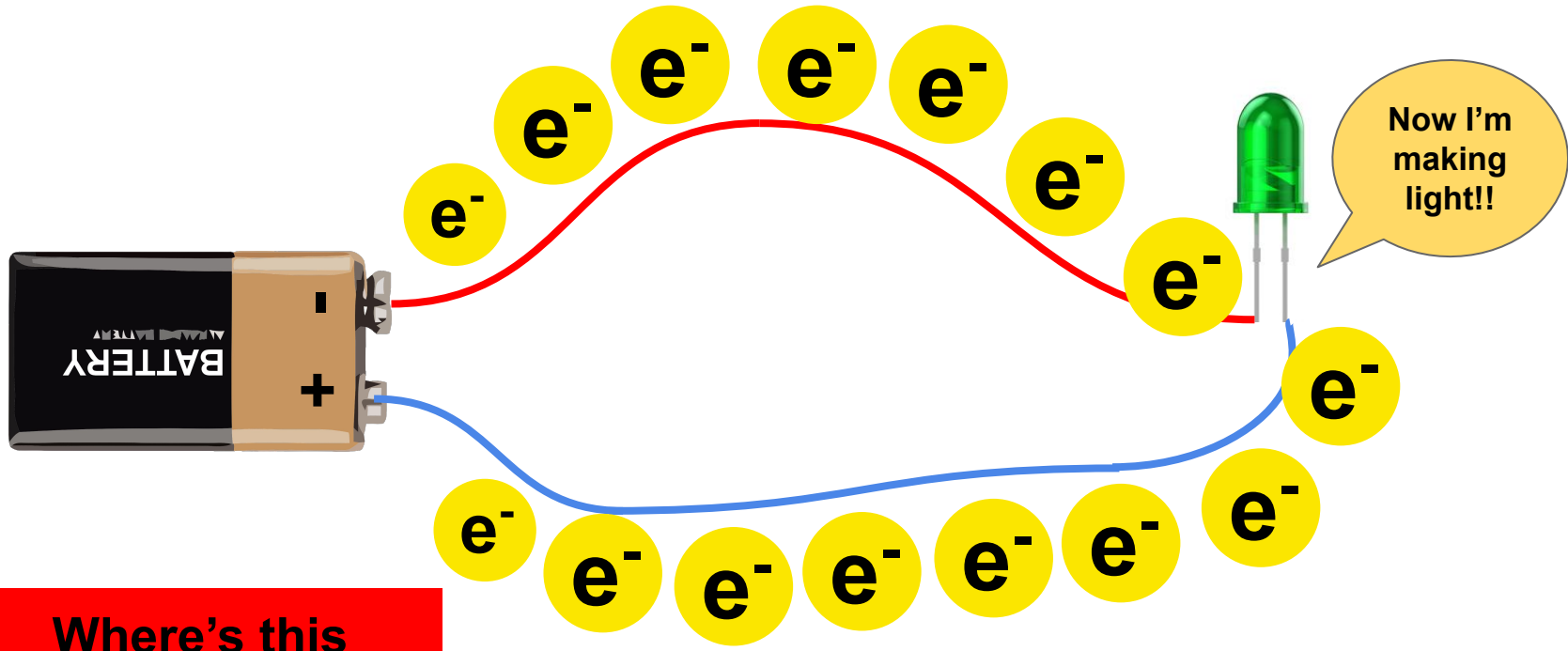

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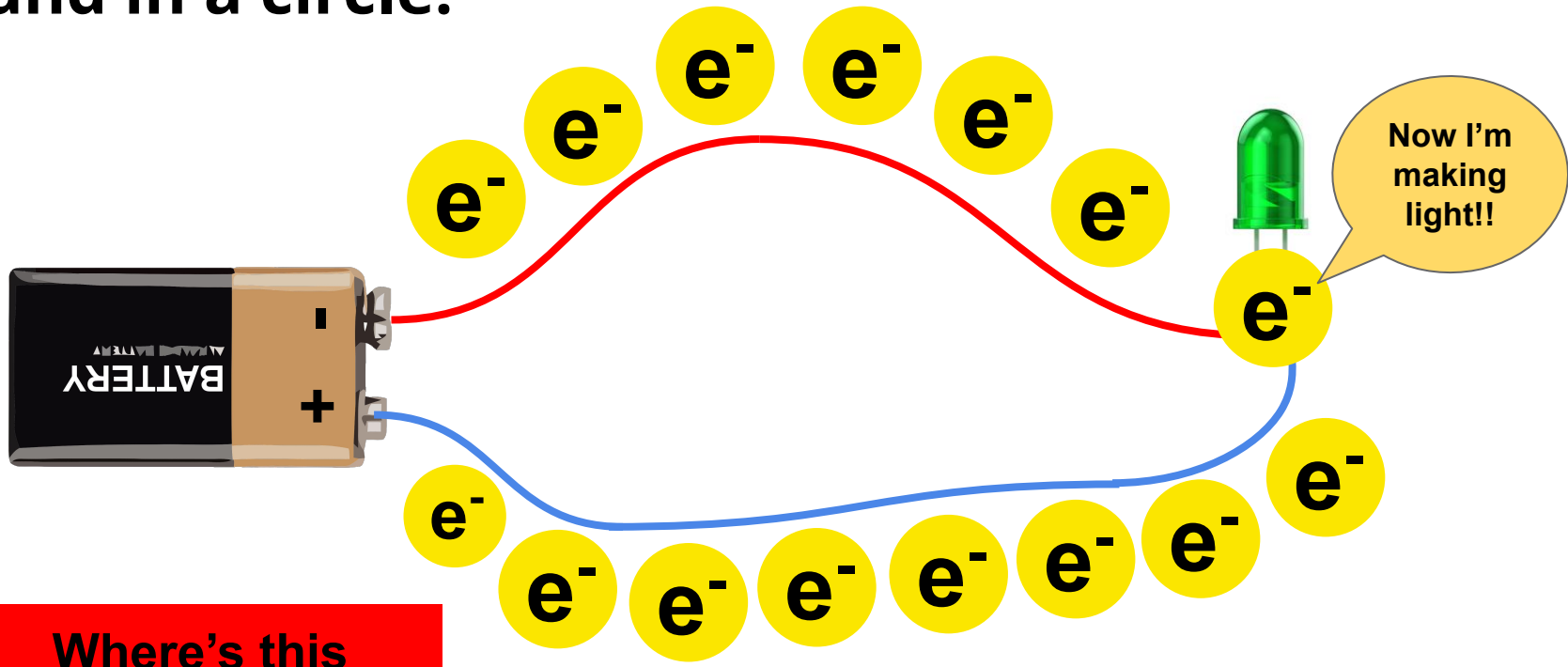

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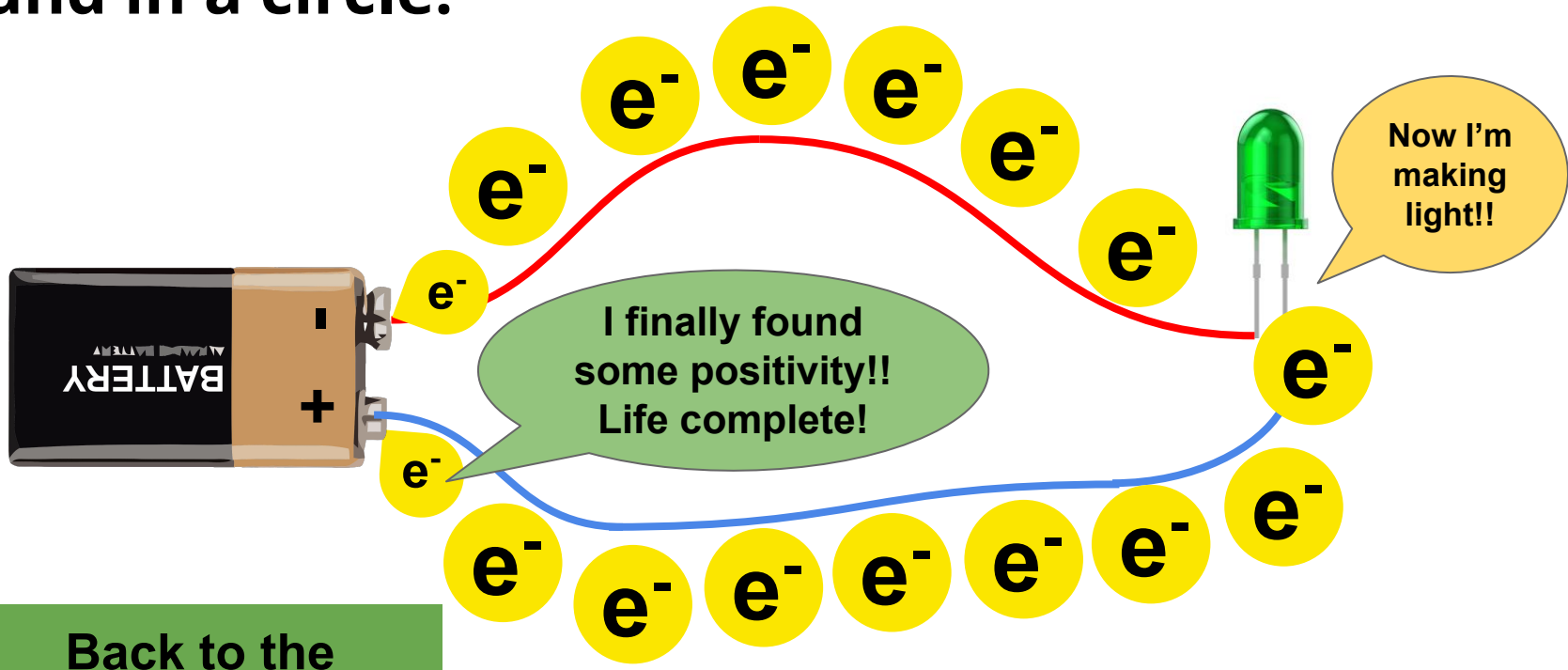

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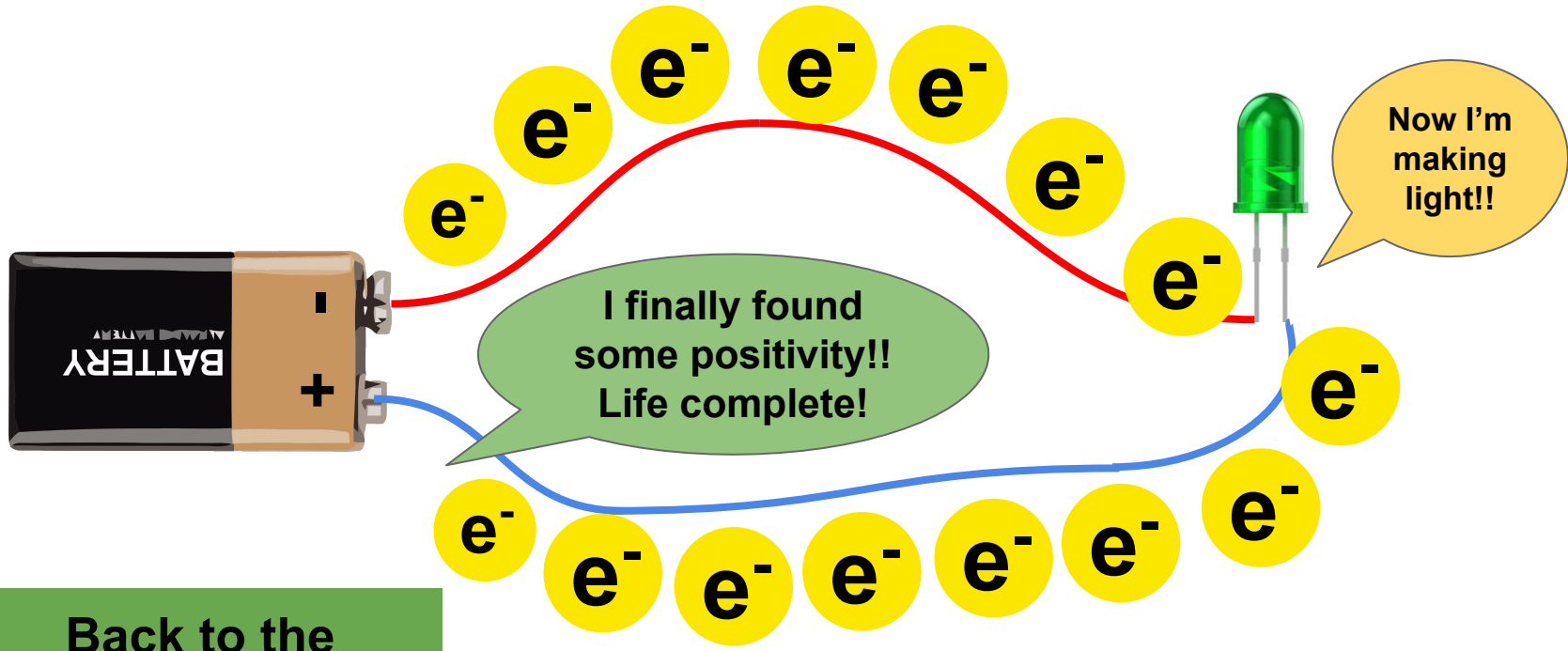

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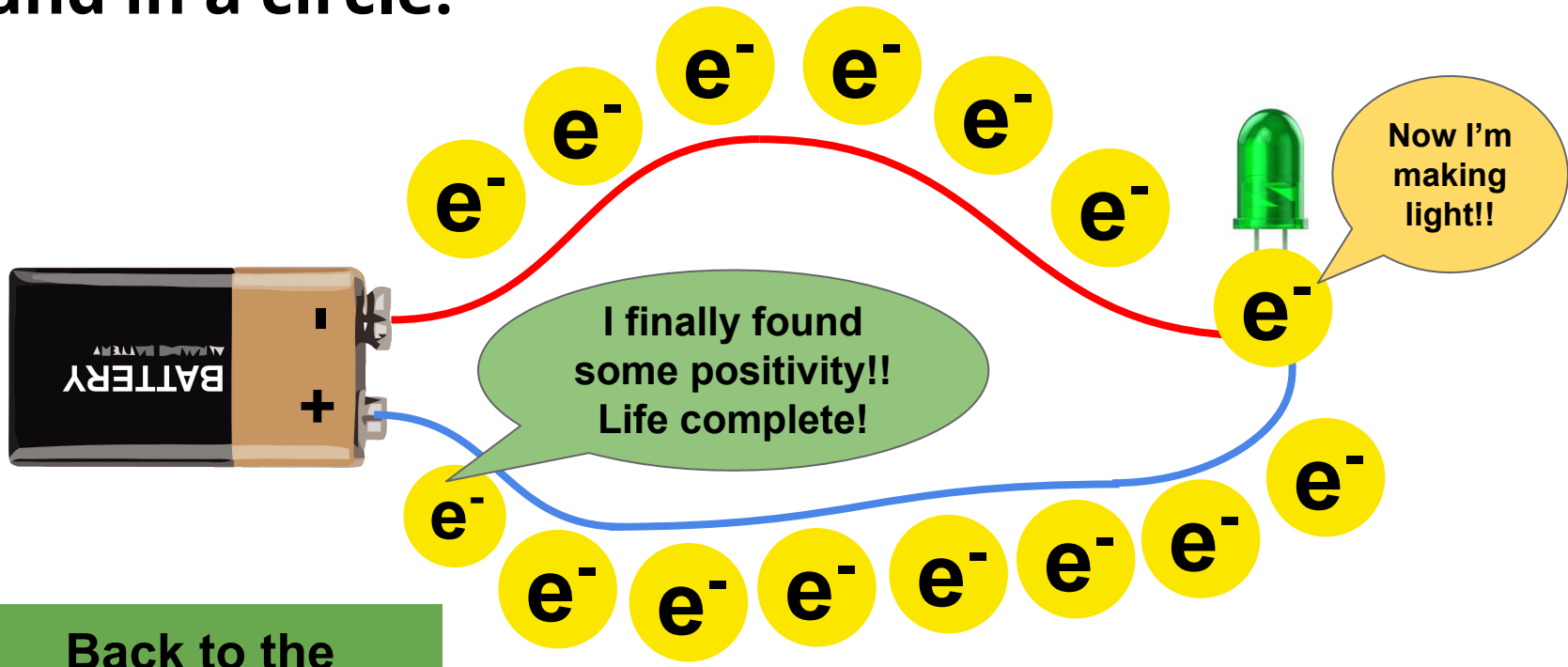

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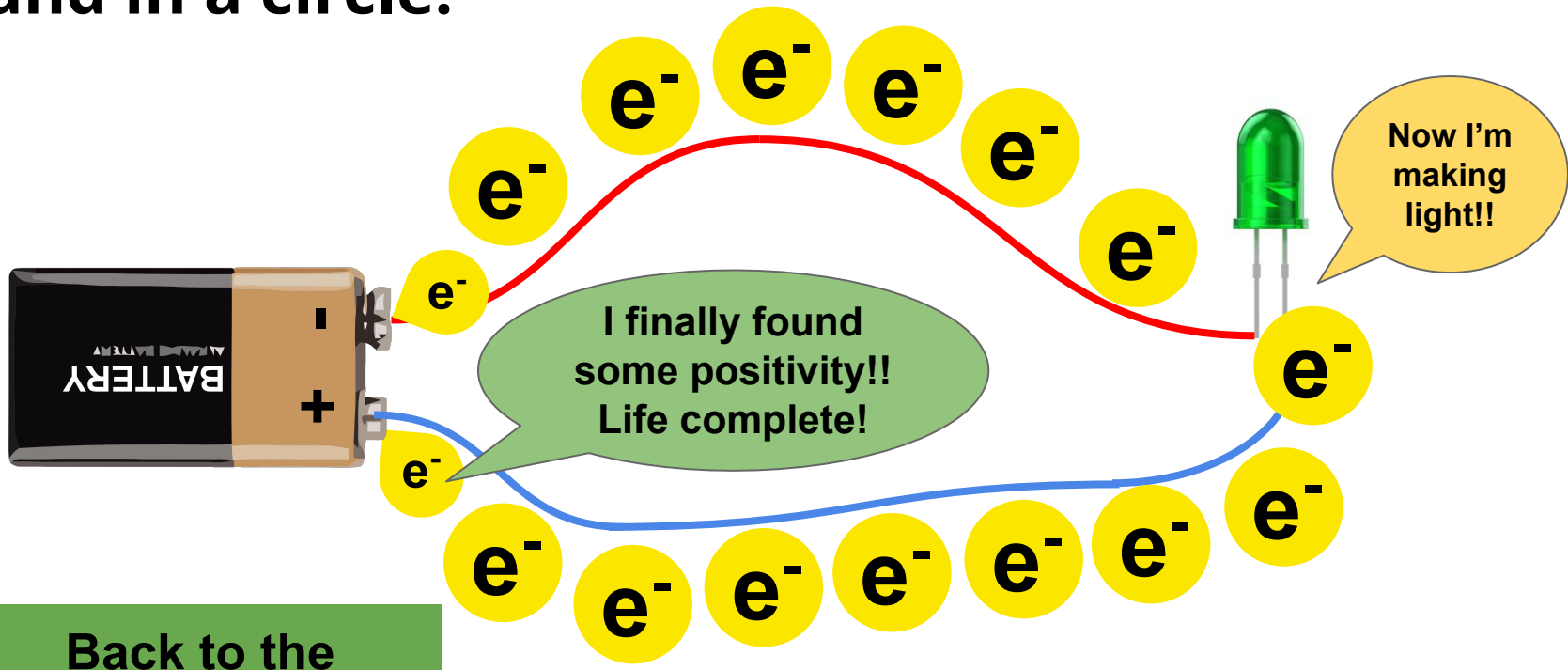
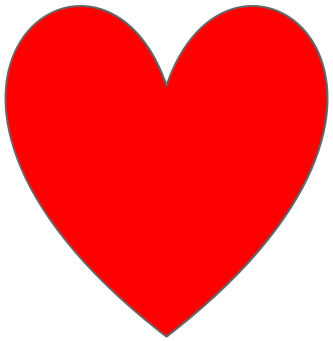
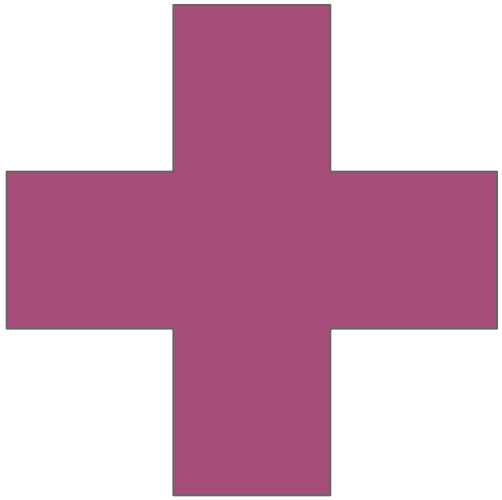


Electrons are negatively charged particles!

Opposites attract!

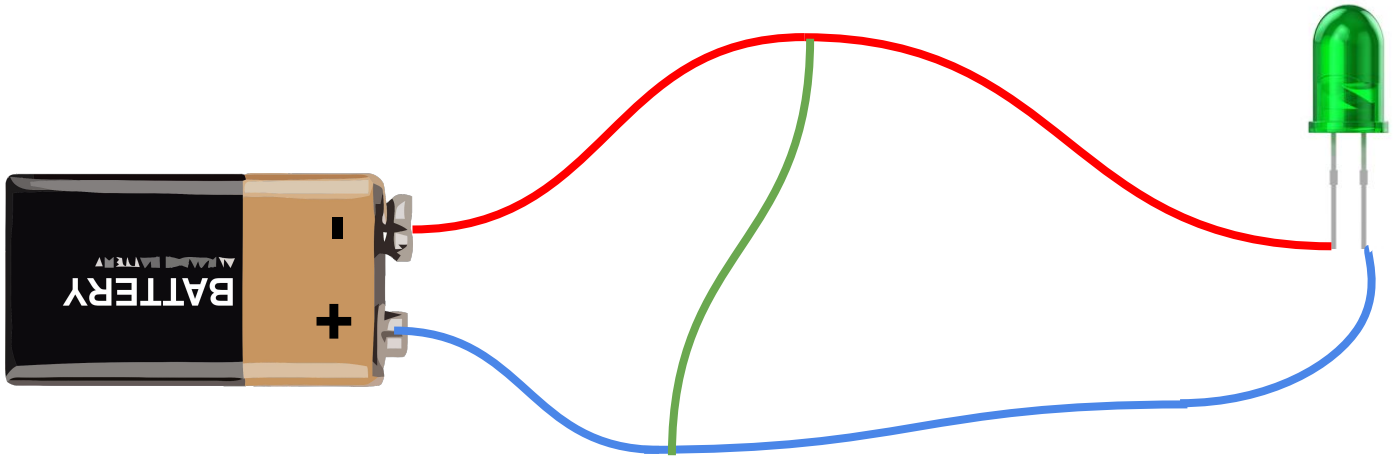




Electrons run through the wire to be with their love, the positive charge!

What is a circuit?

But what if there is a faster way to get to the positive charge?



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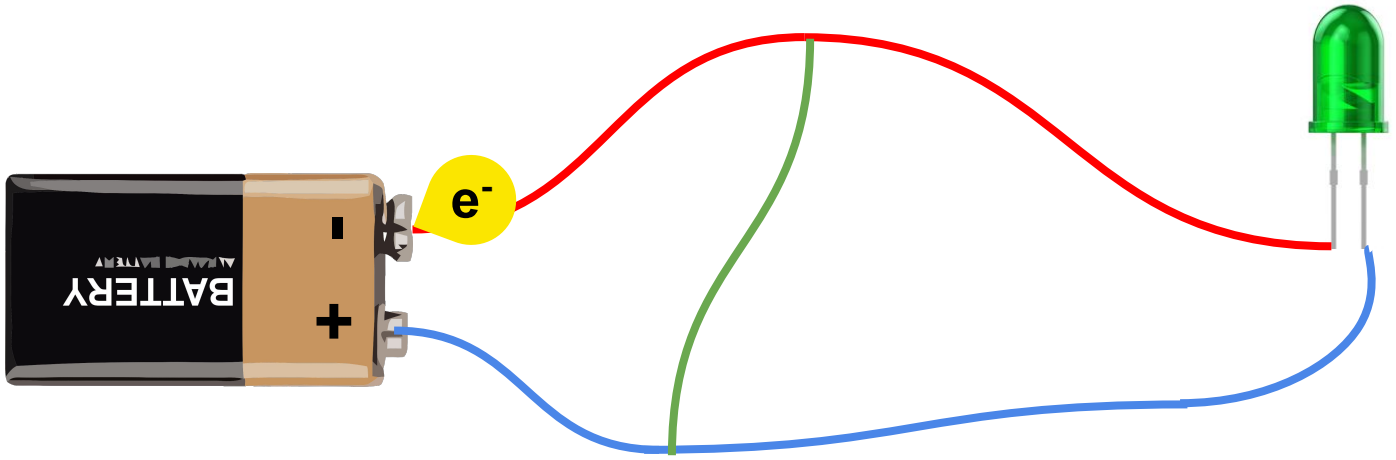

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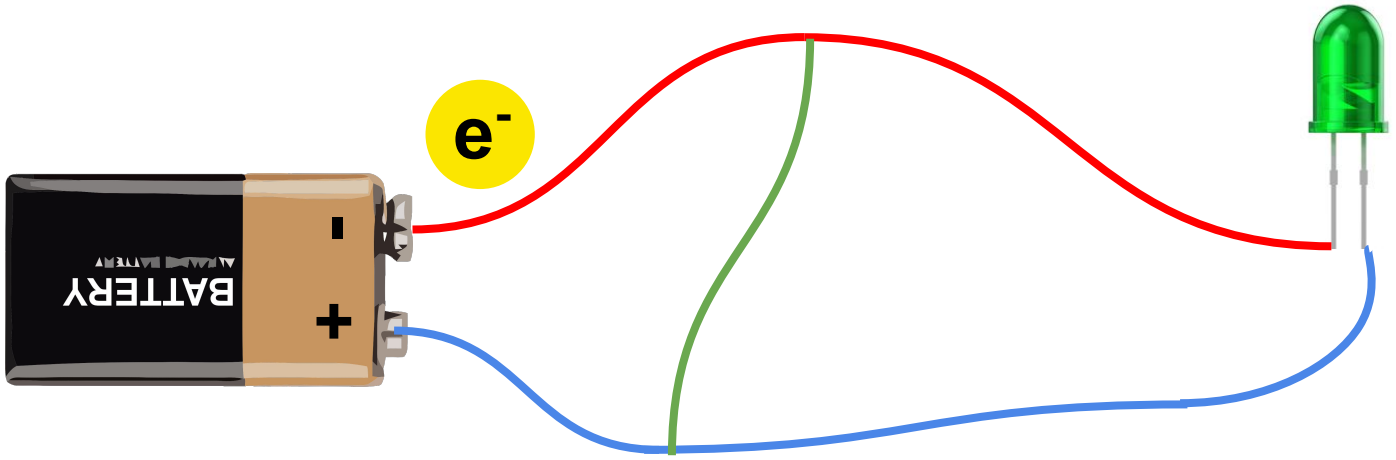

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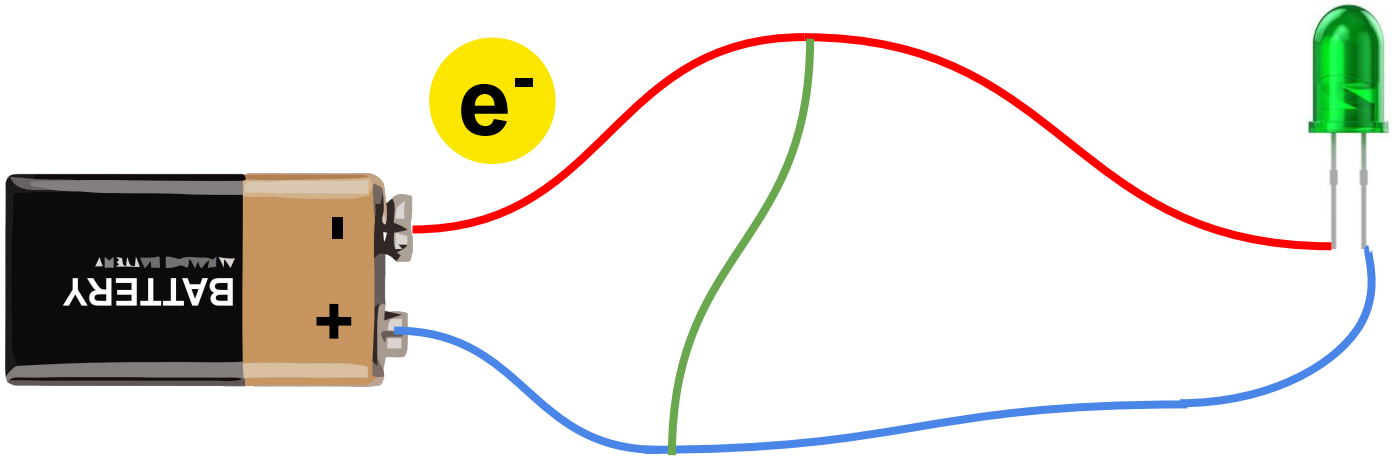

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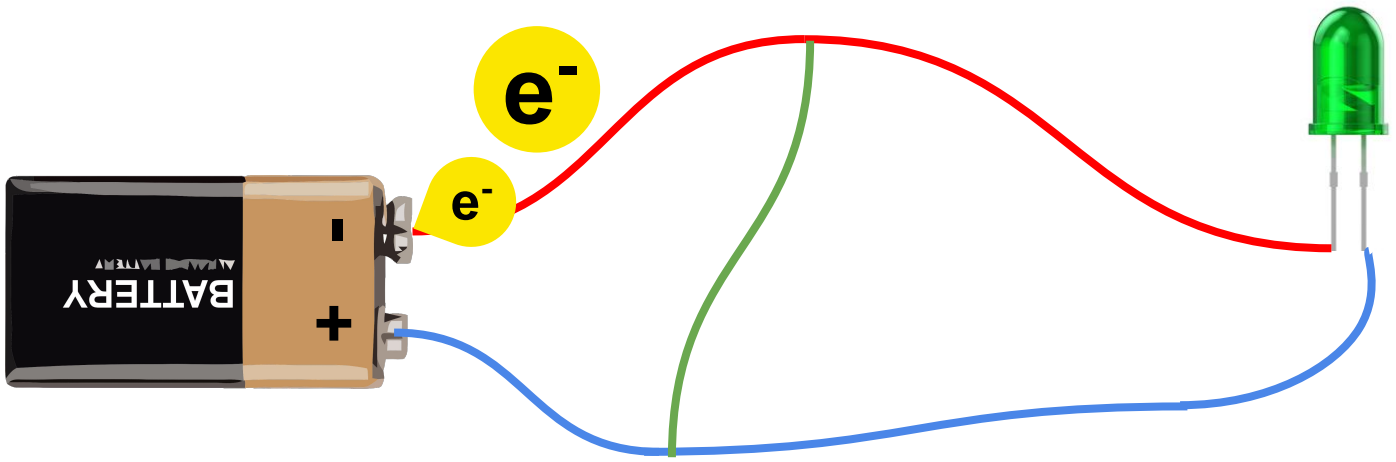

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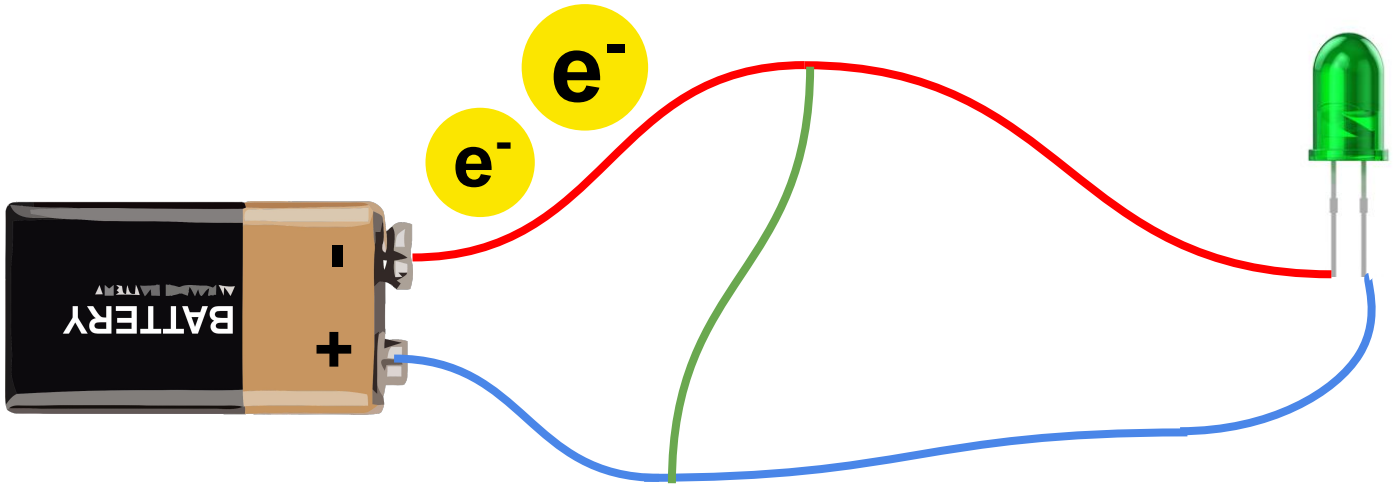

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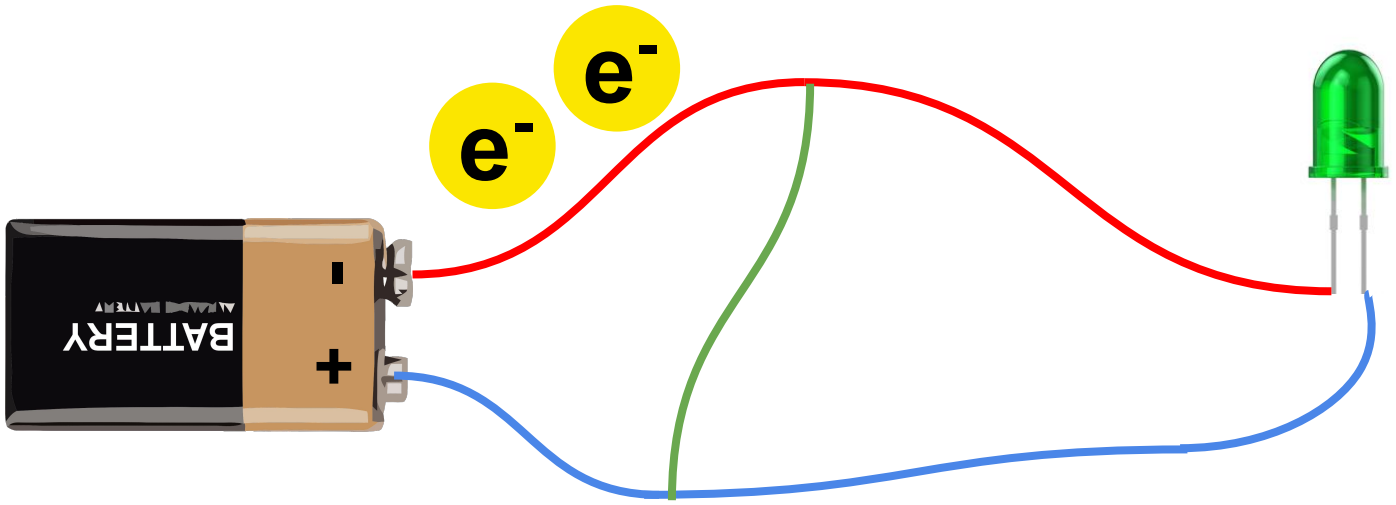

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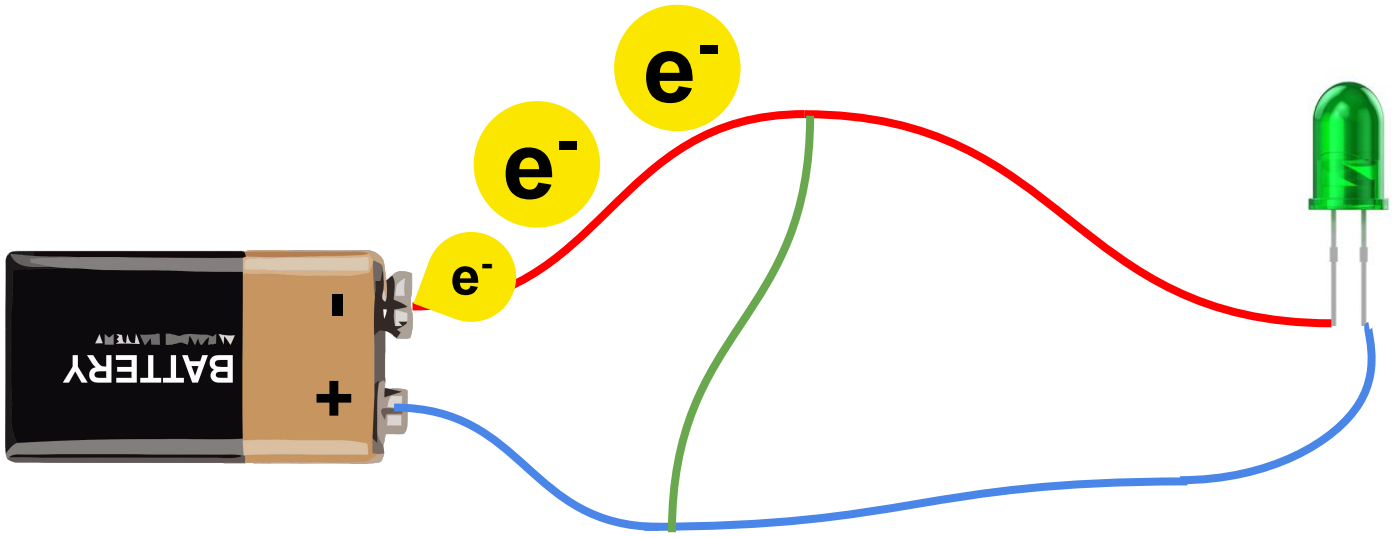

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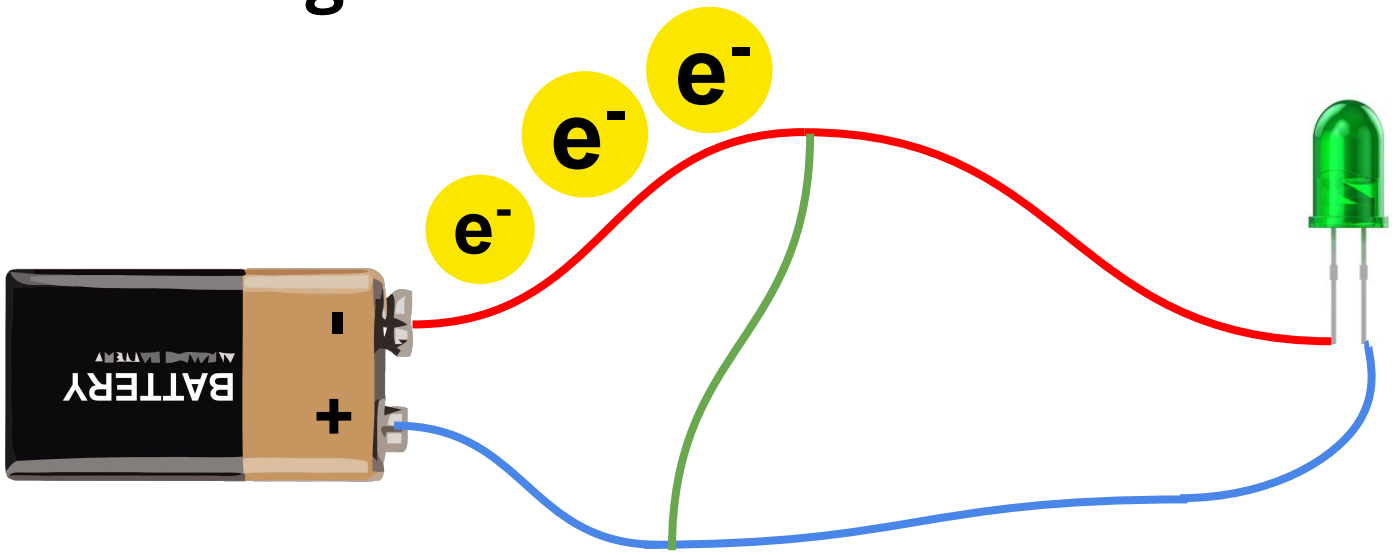

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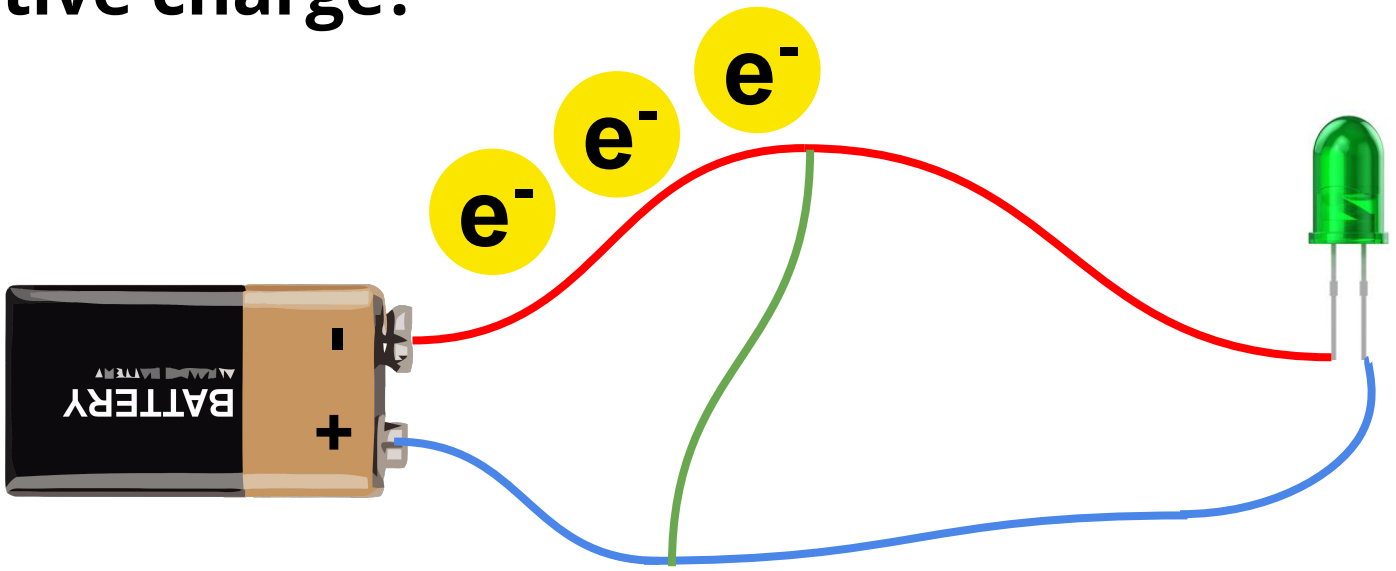

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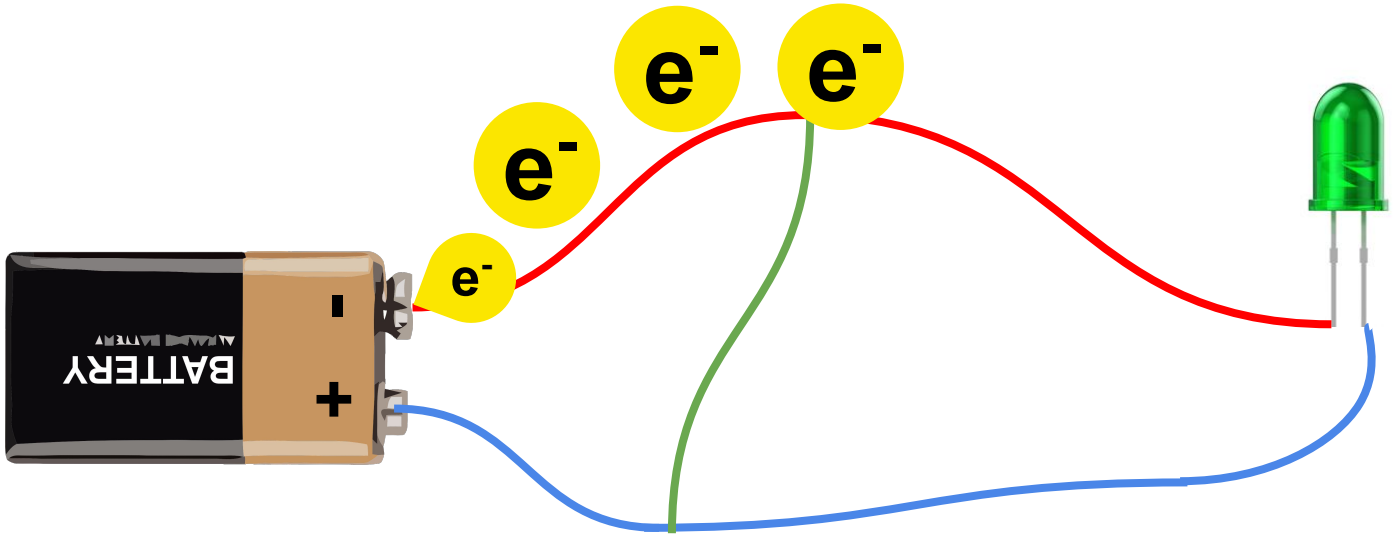

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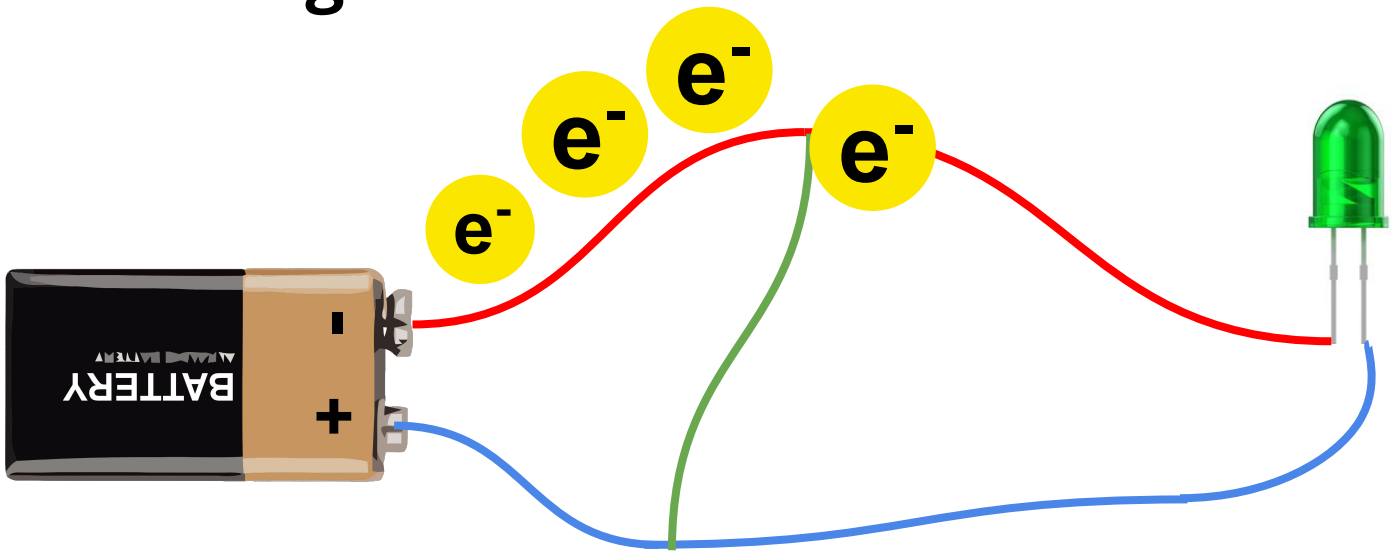

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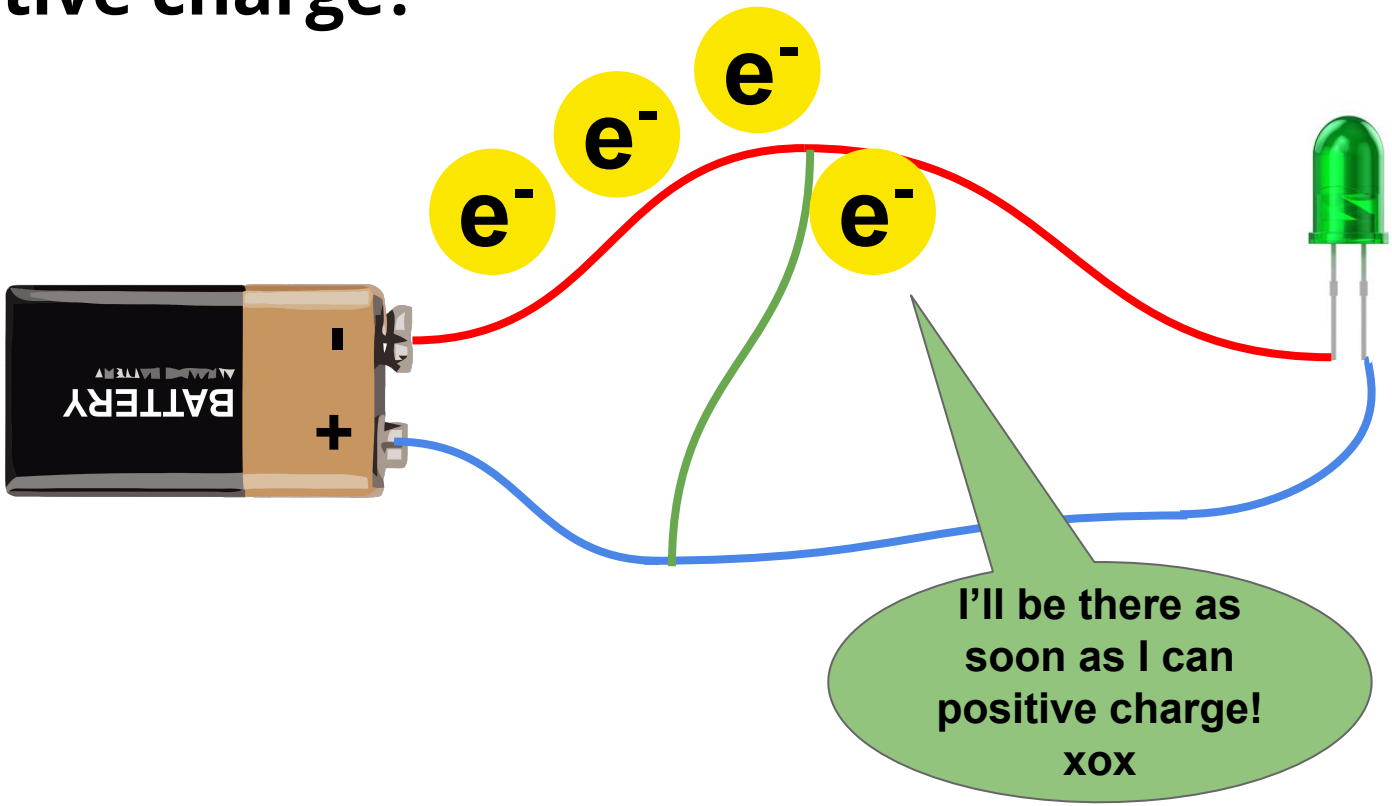

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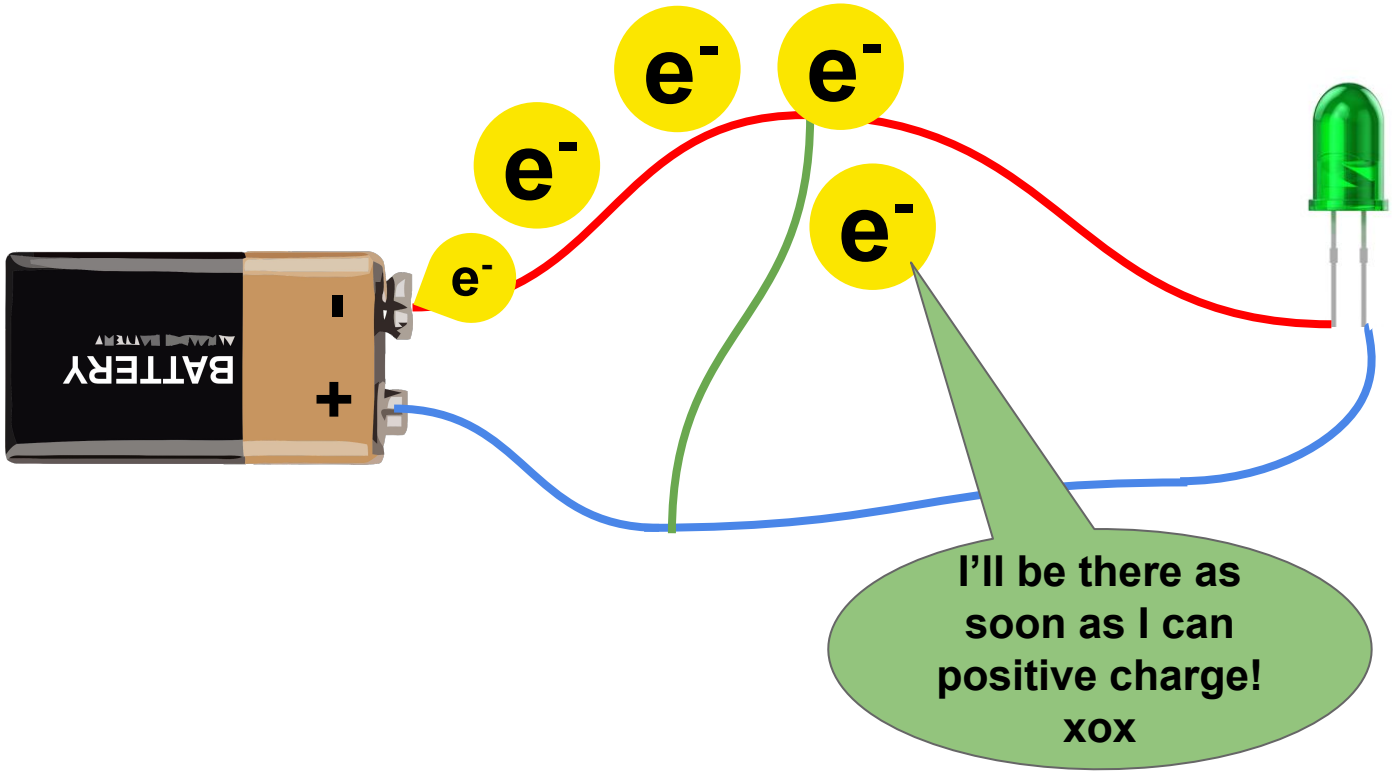

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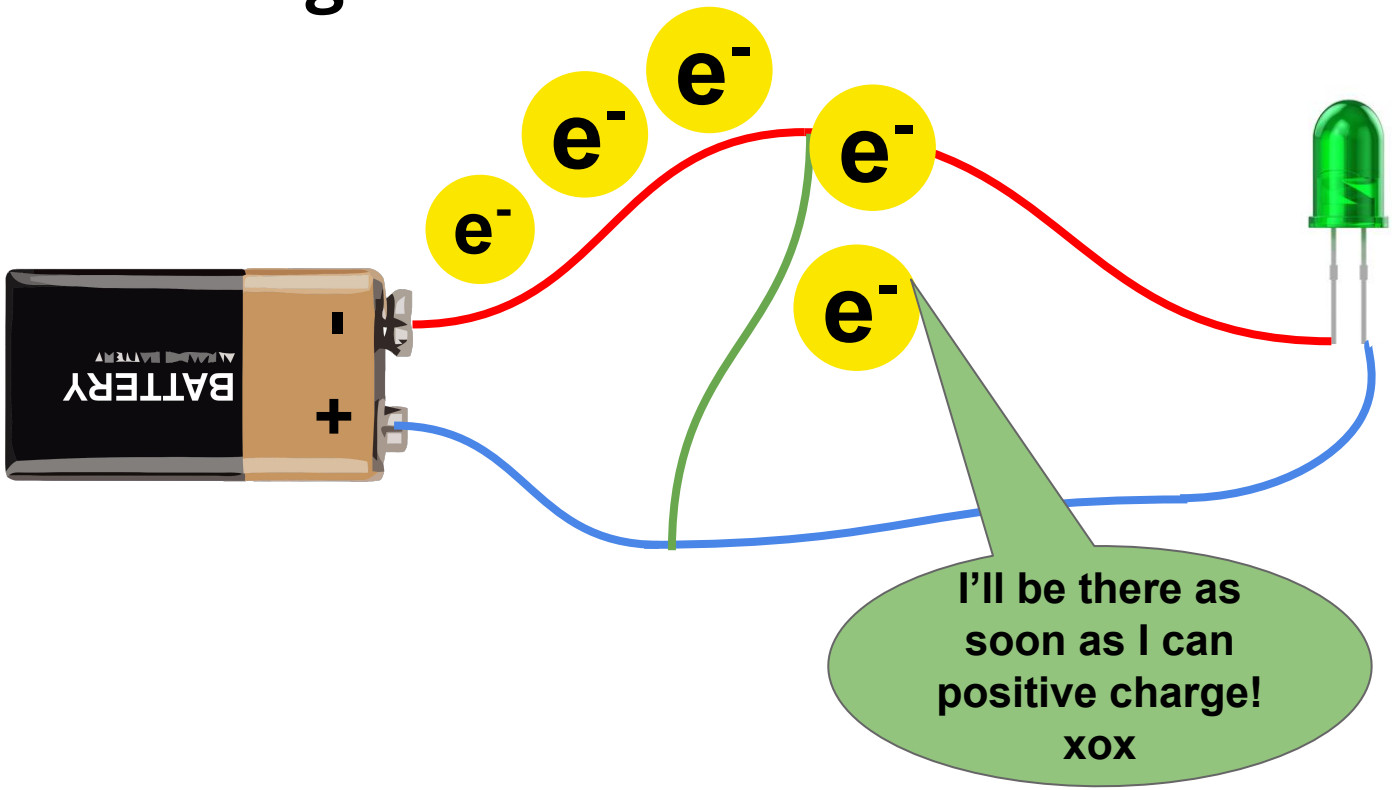

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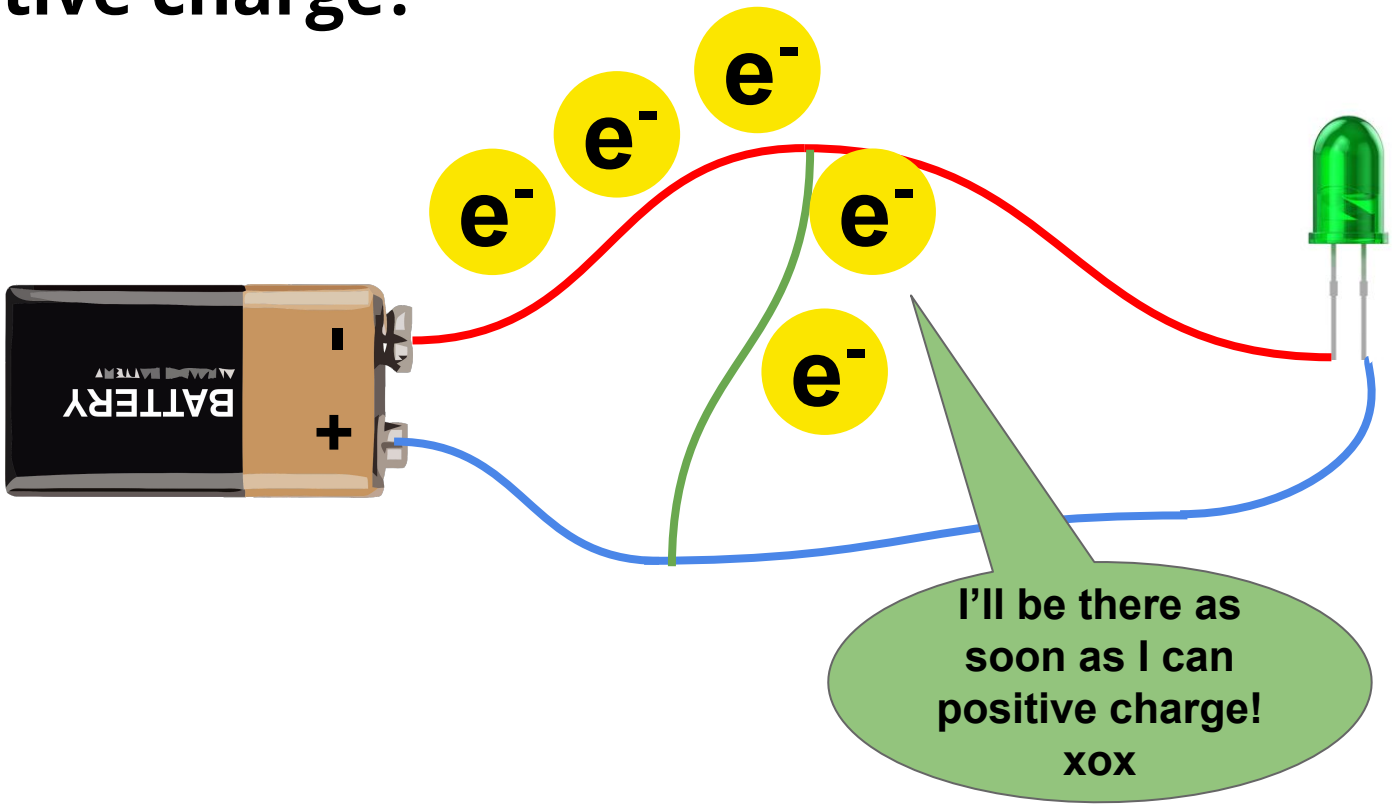

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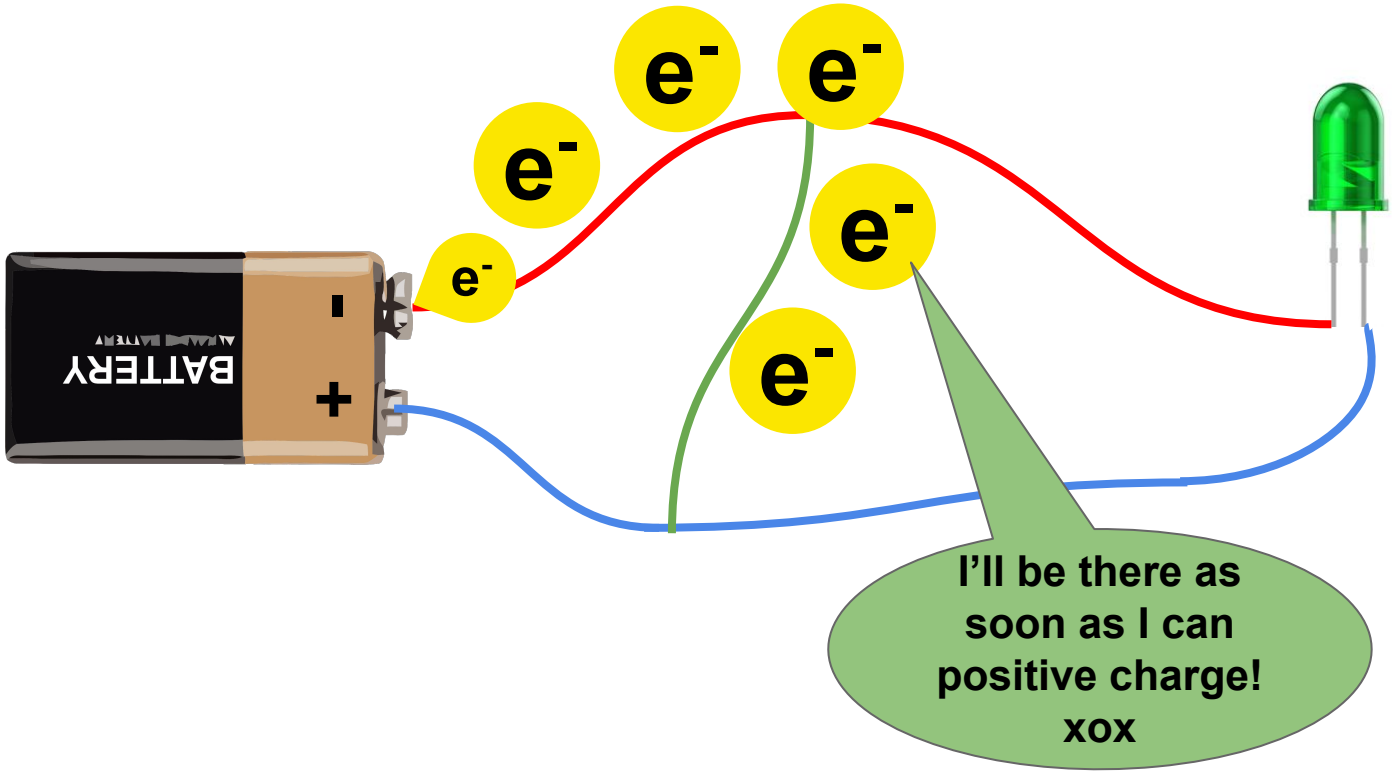

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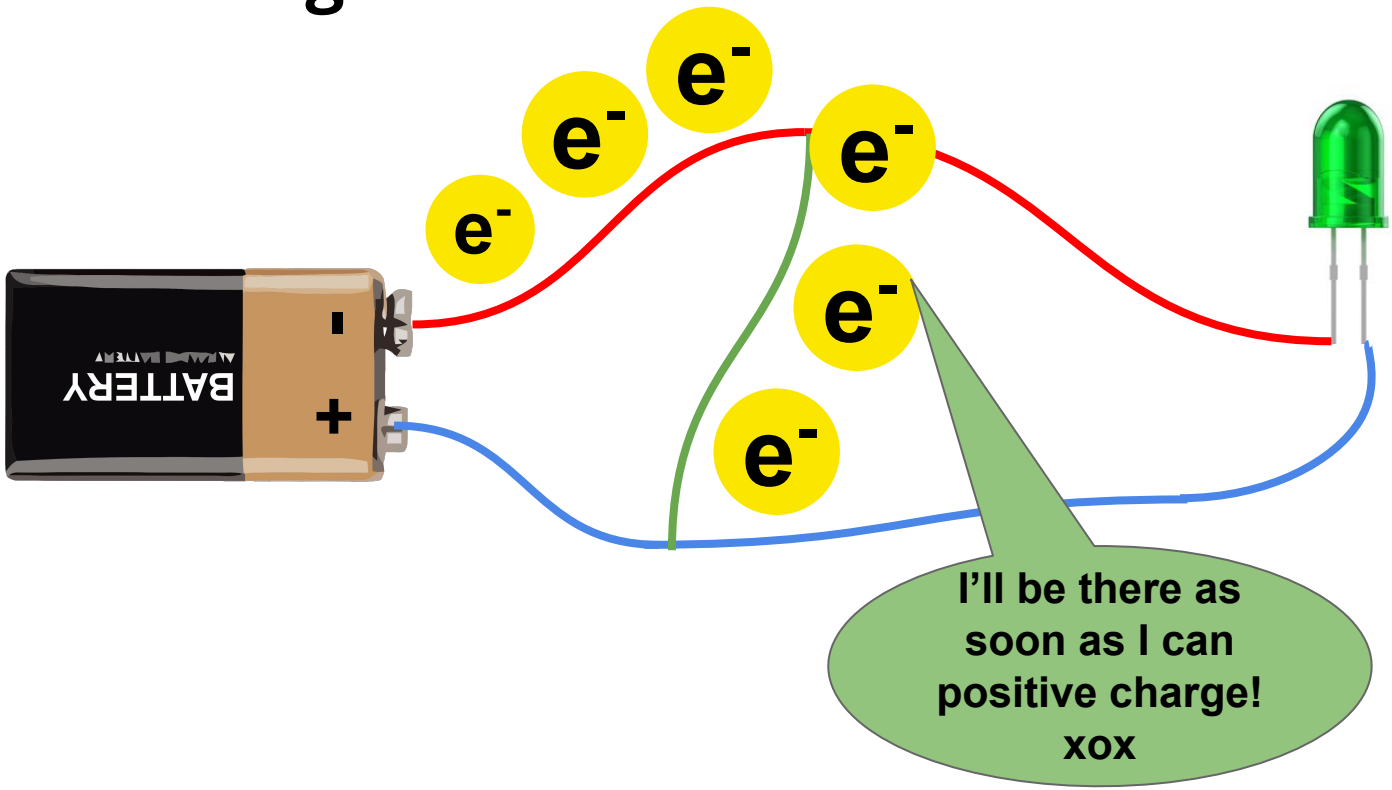

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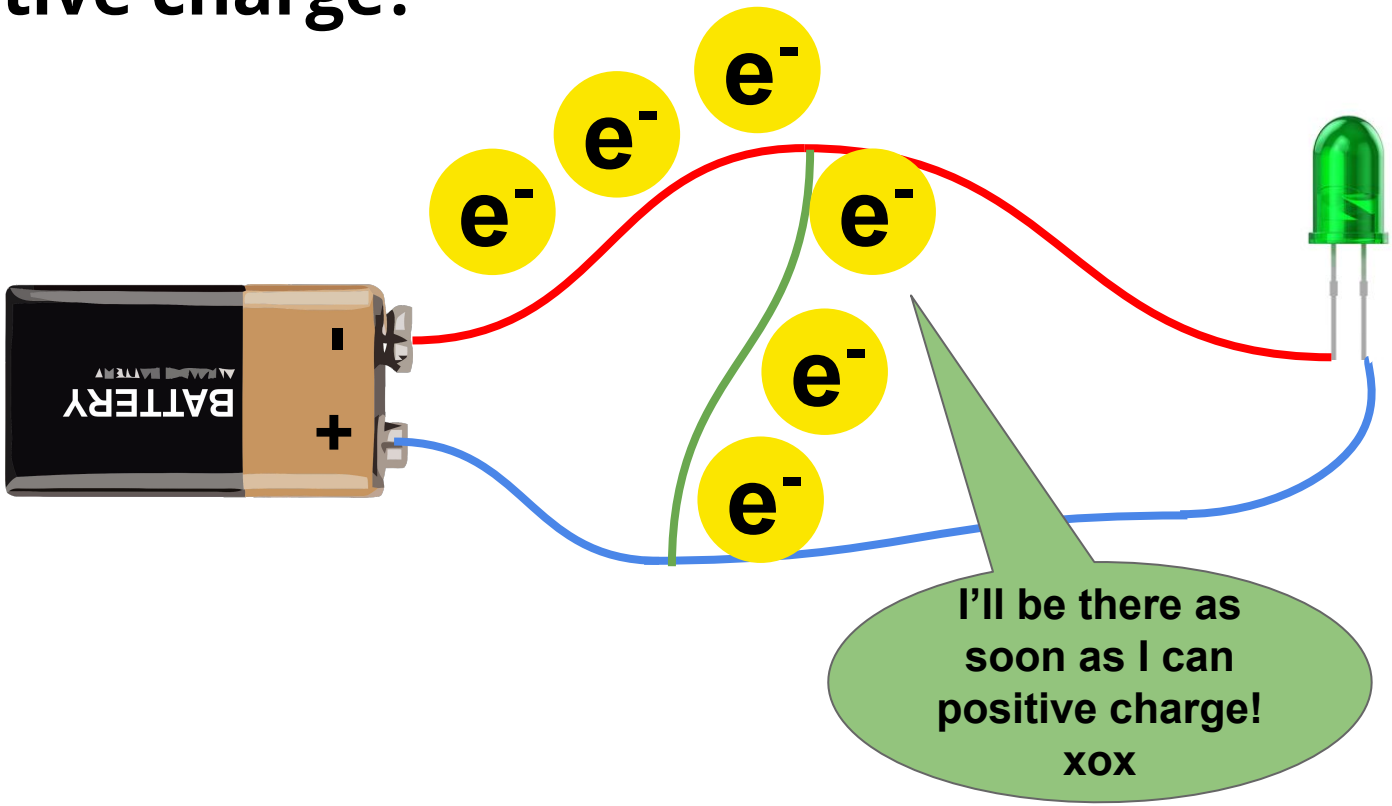

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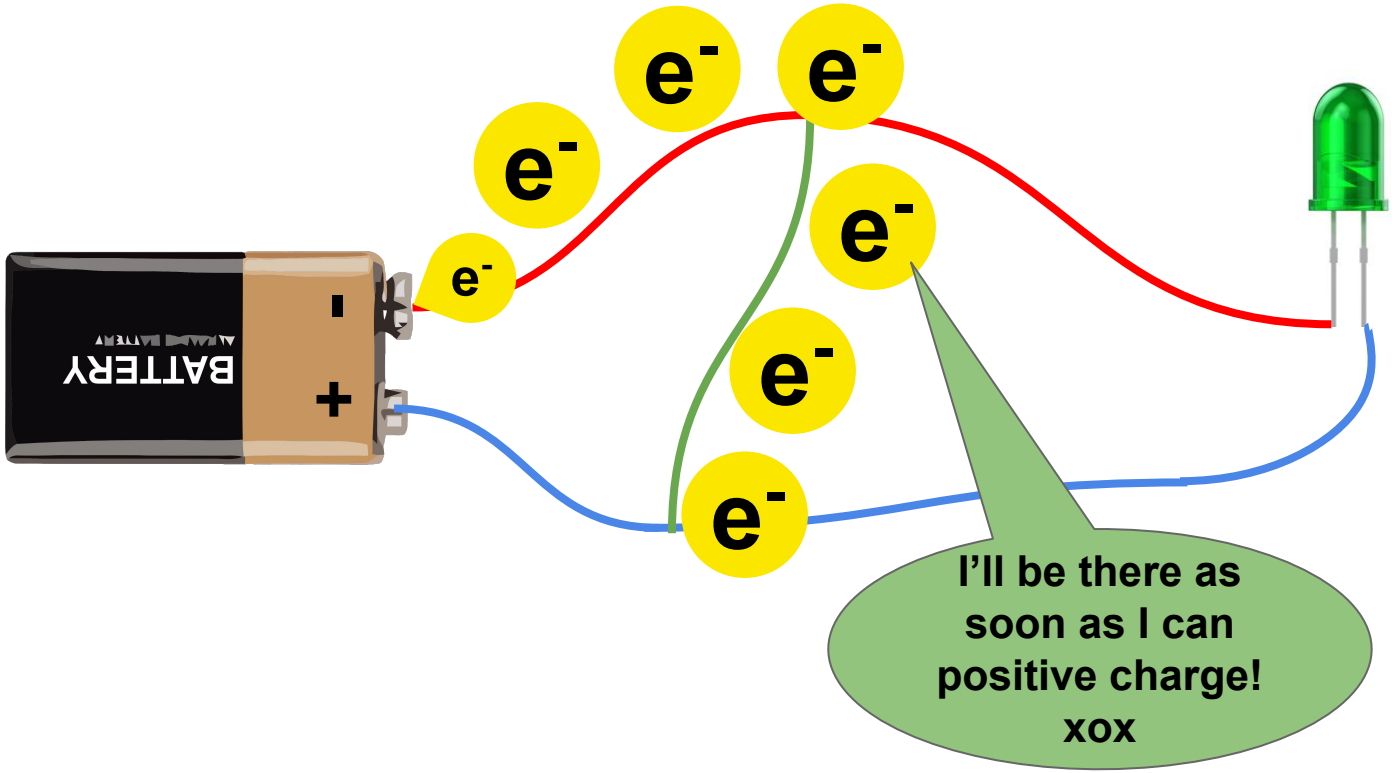

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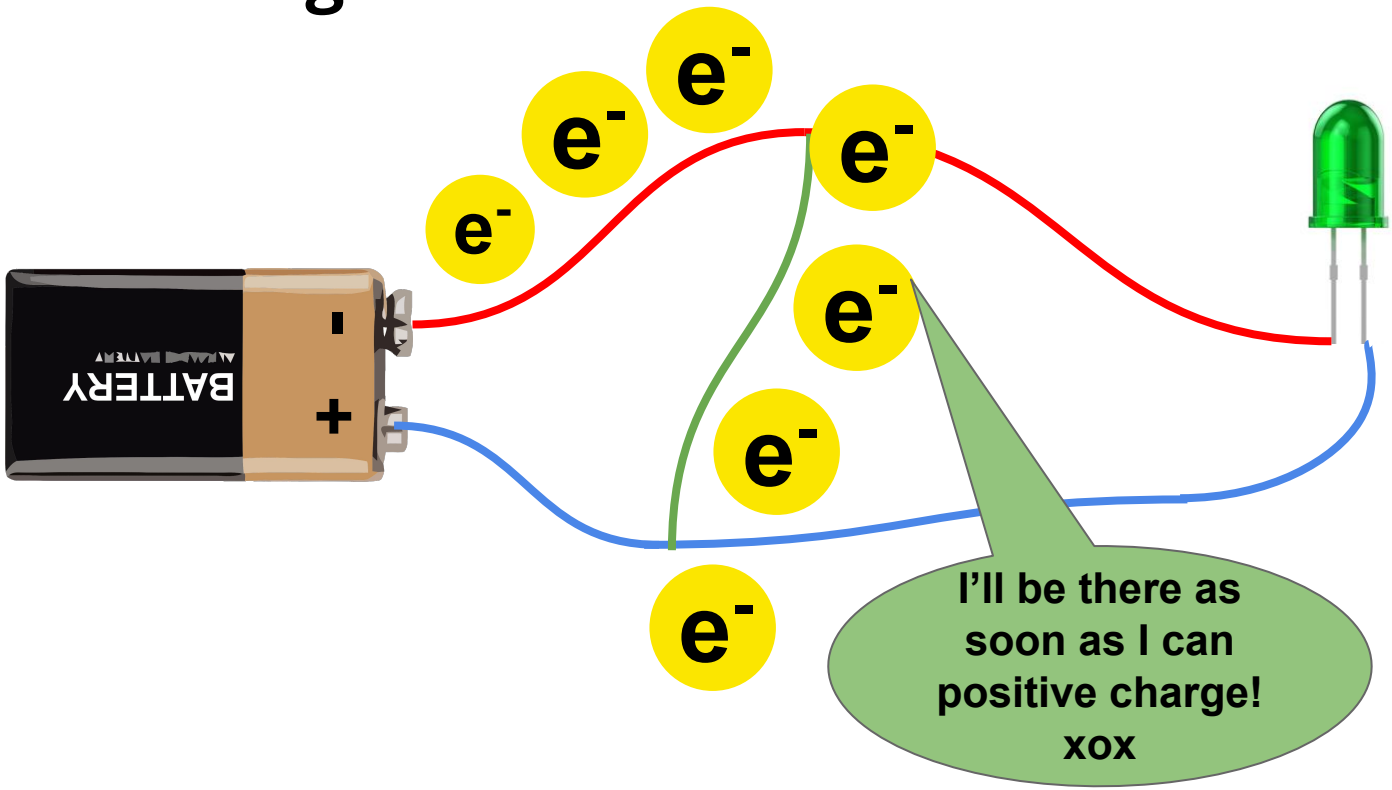

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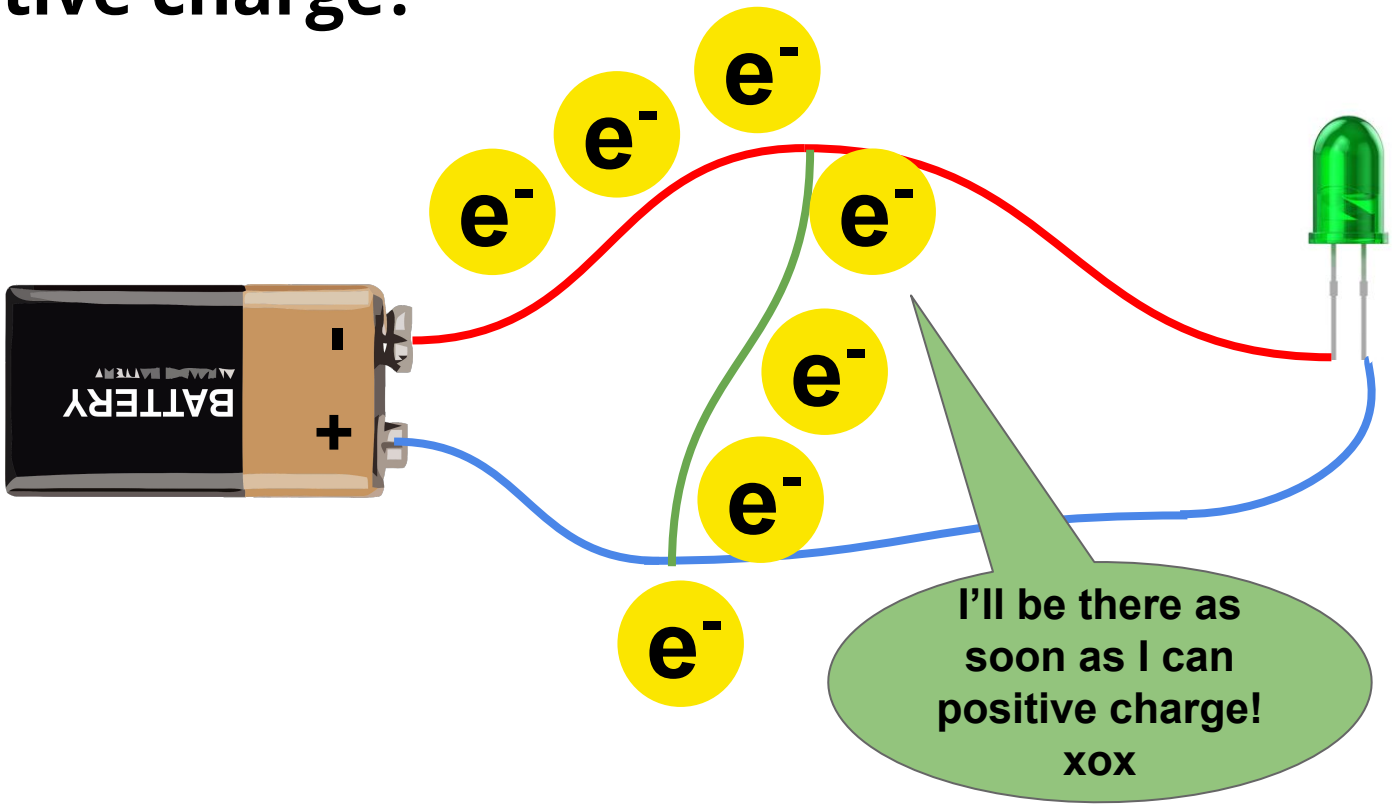

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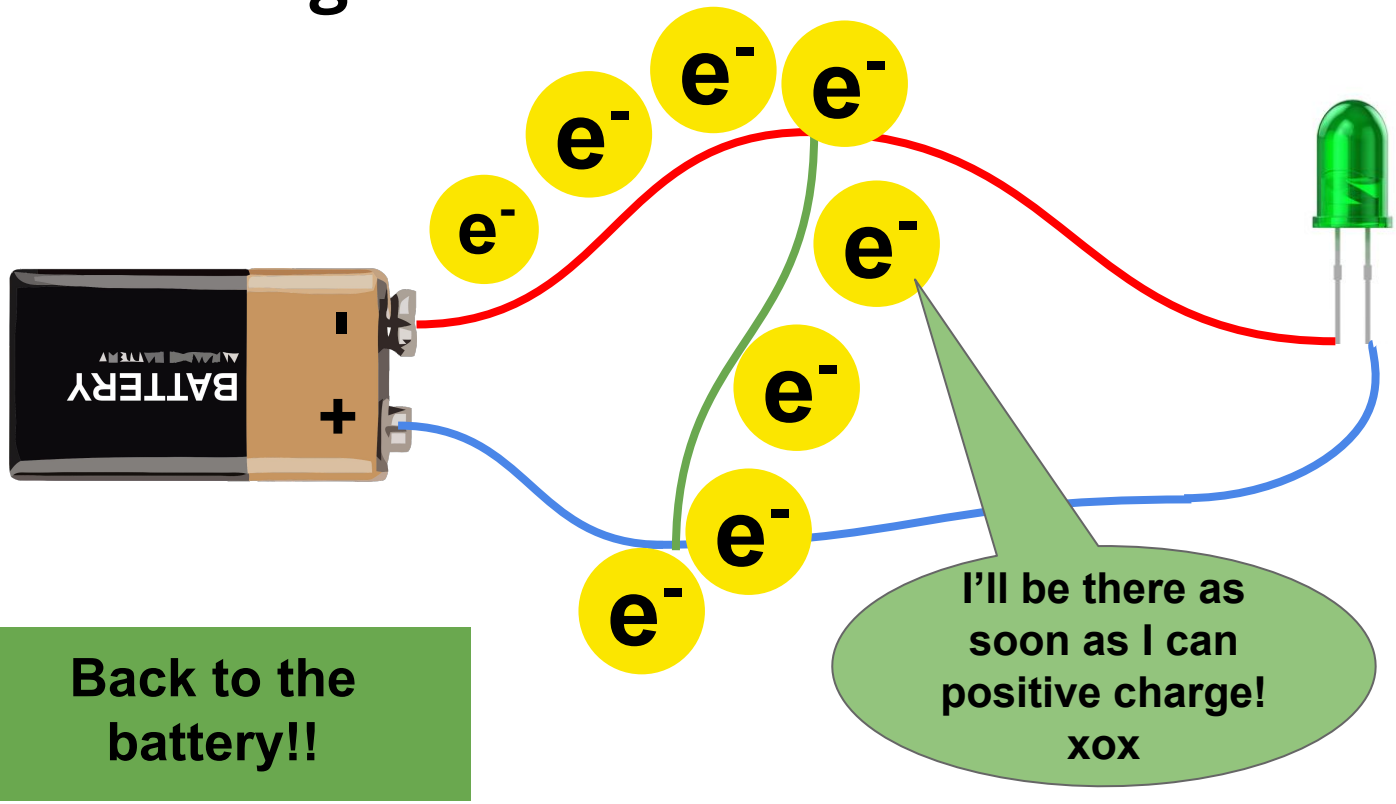

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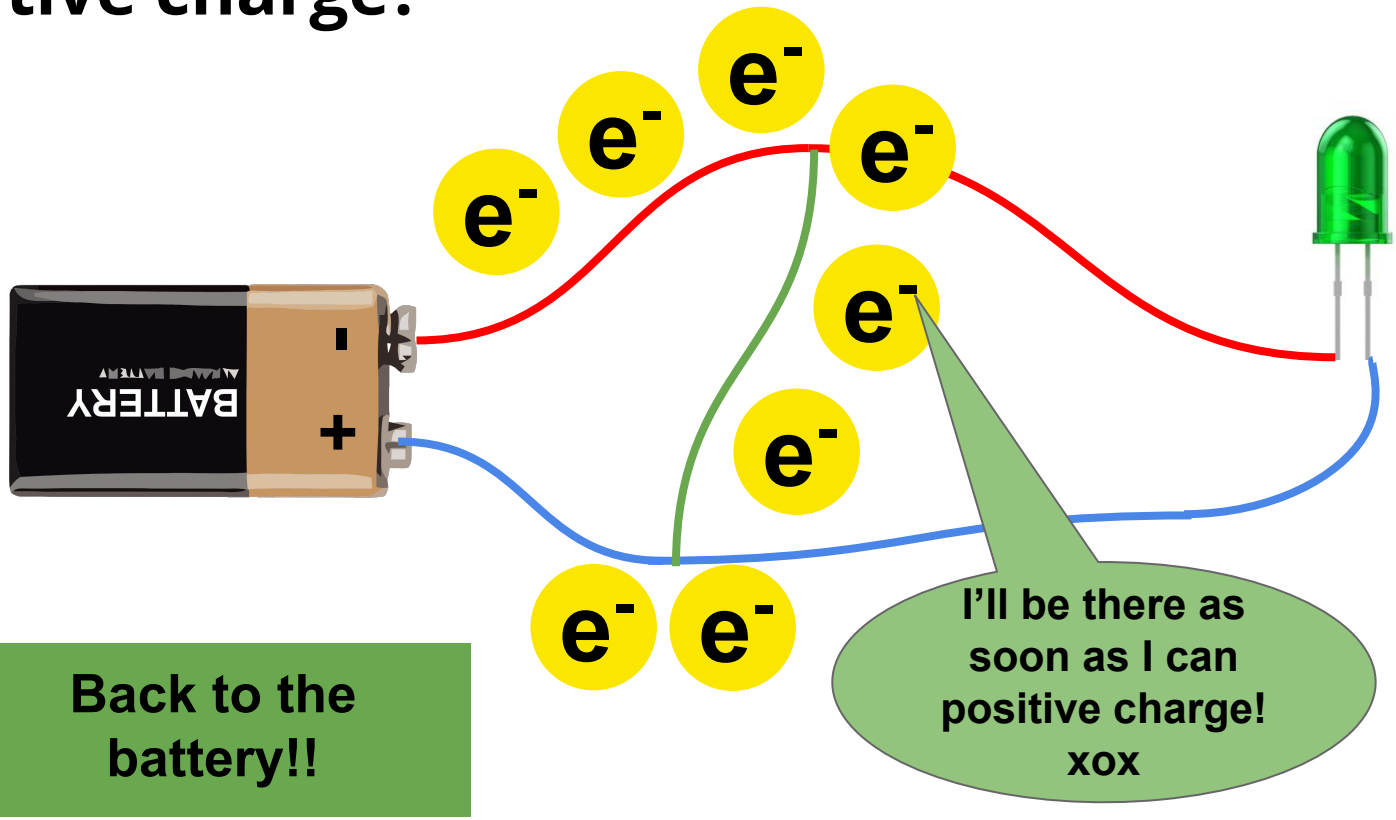

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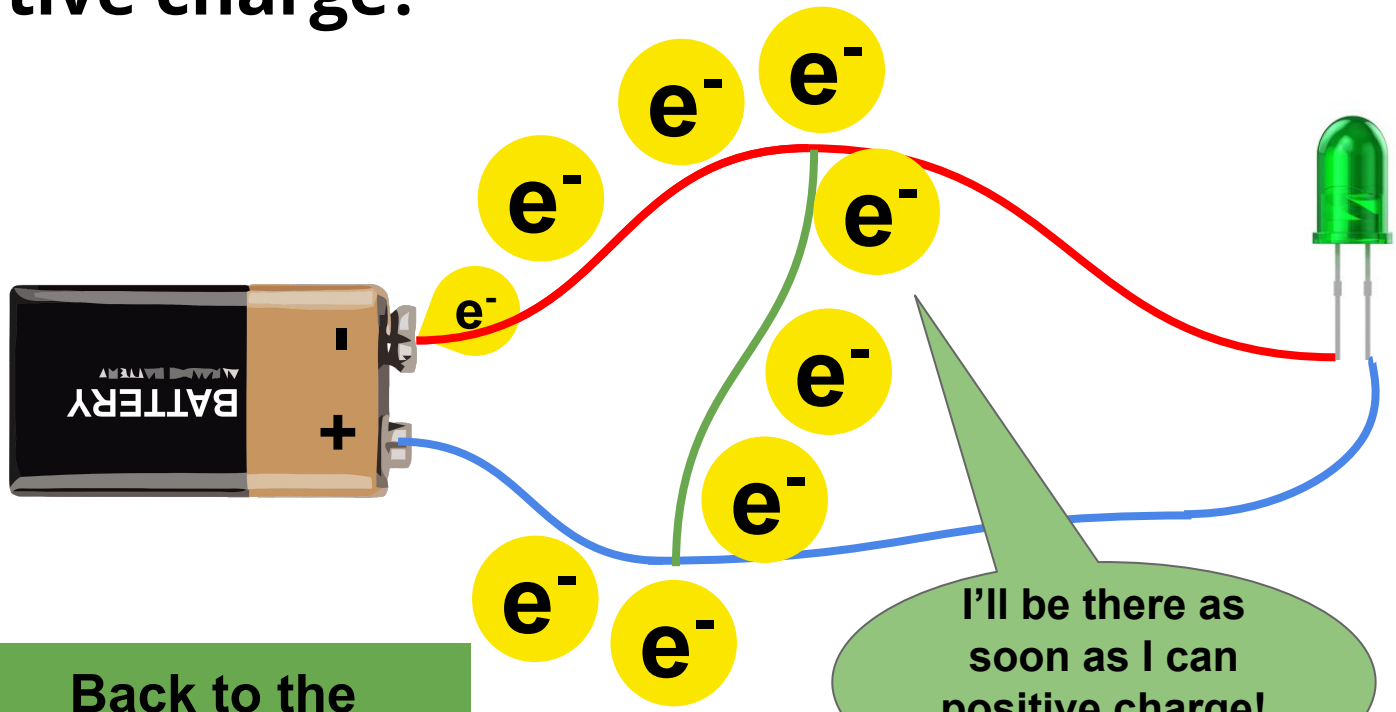

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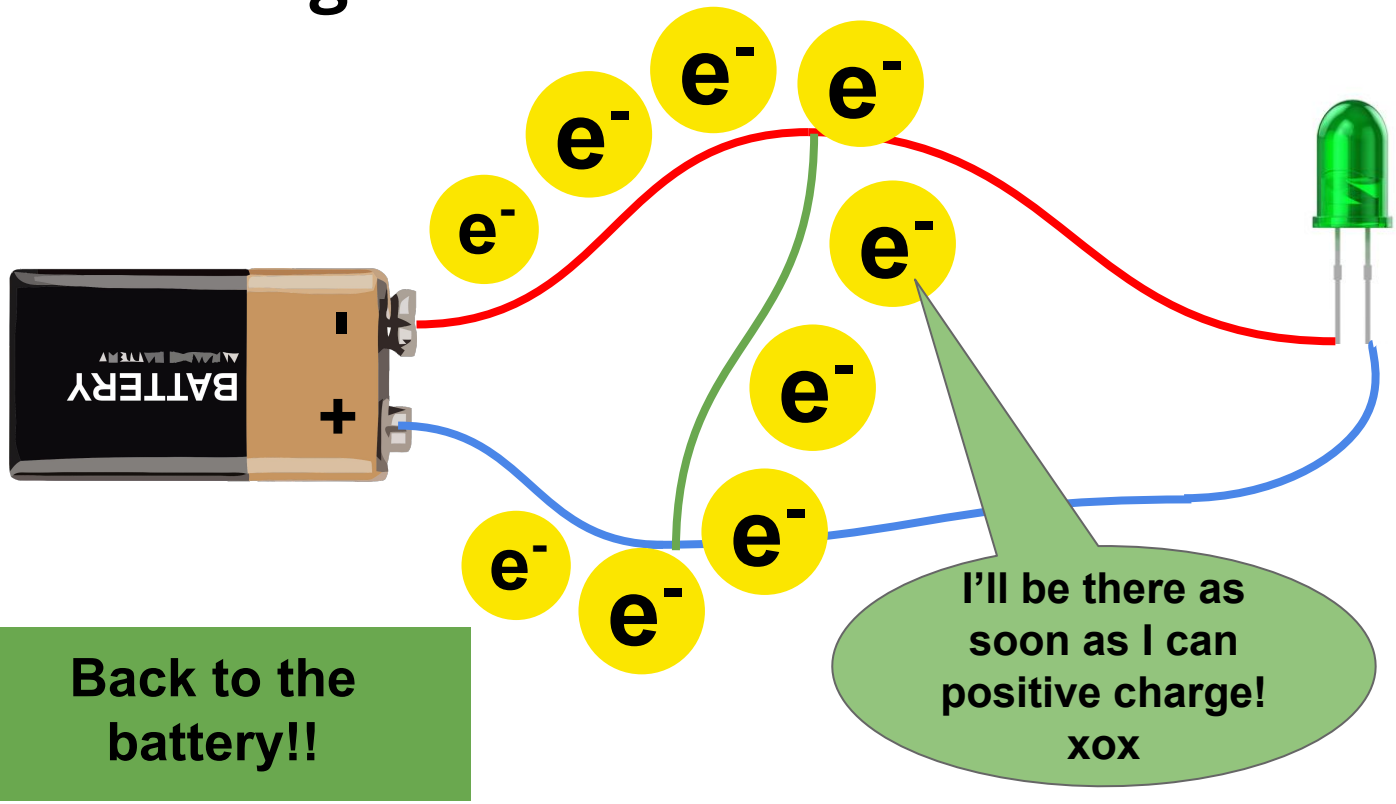

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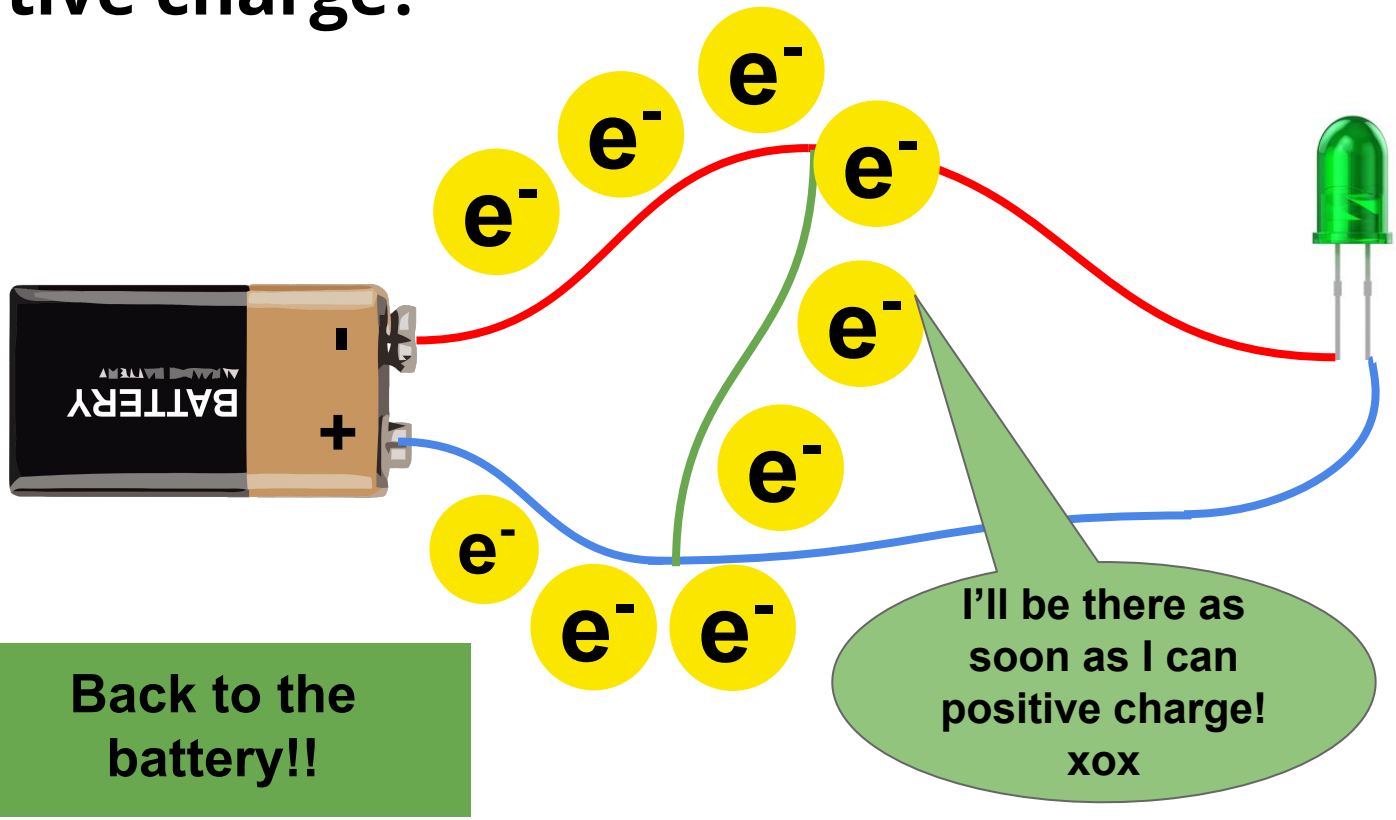

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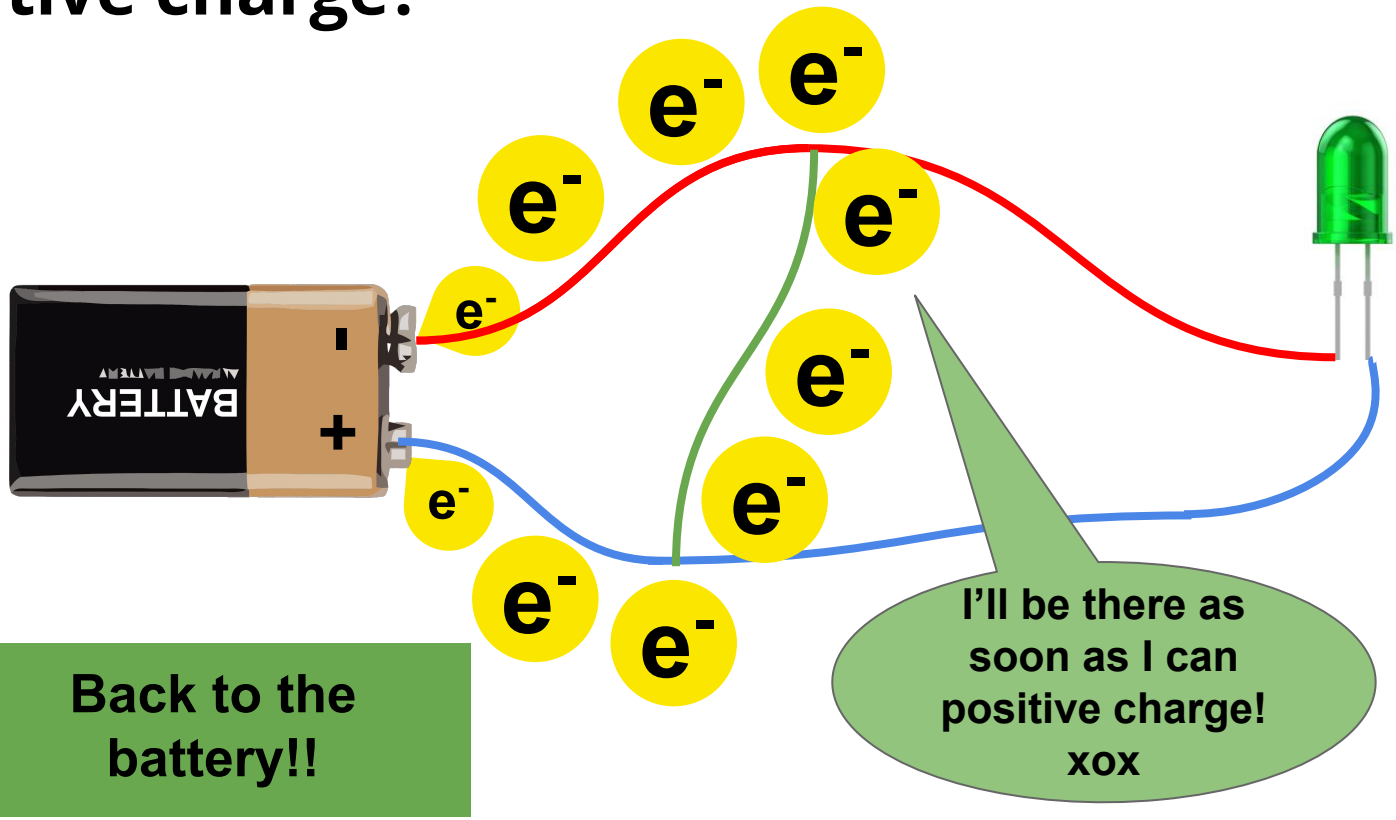

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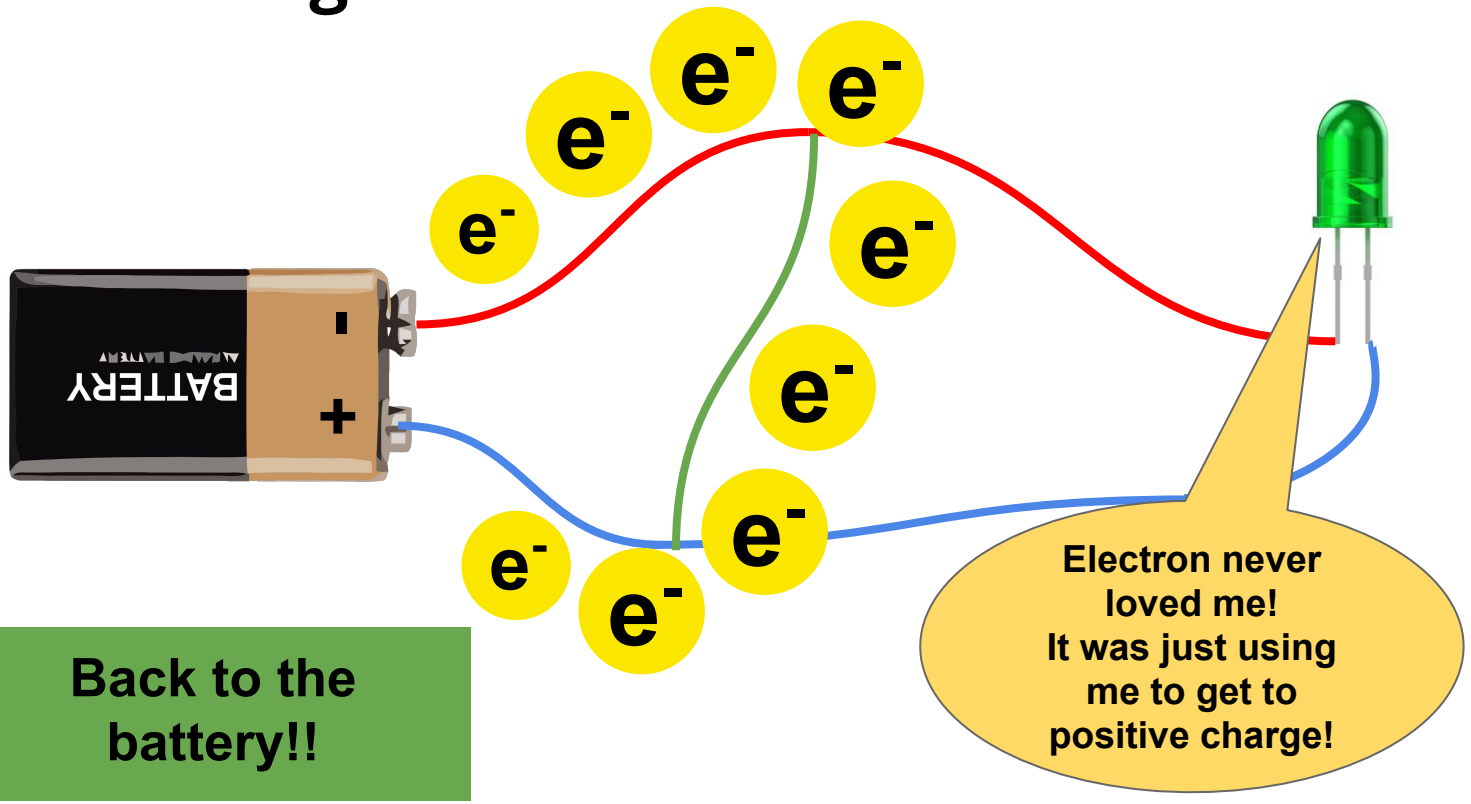

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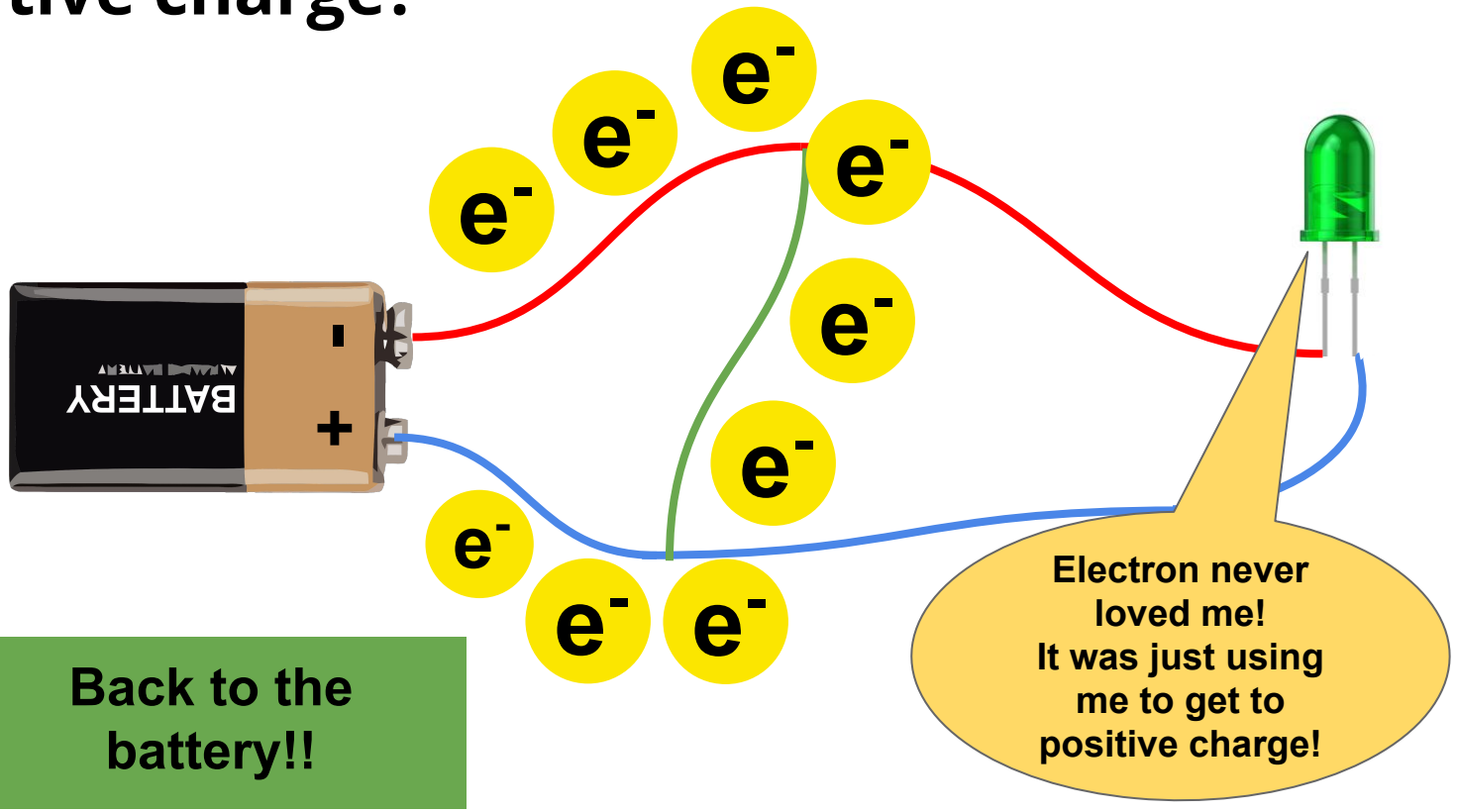

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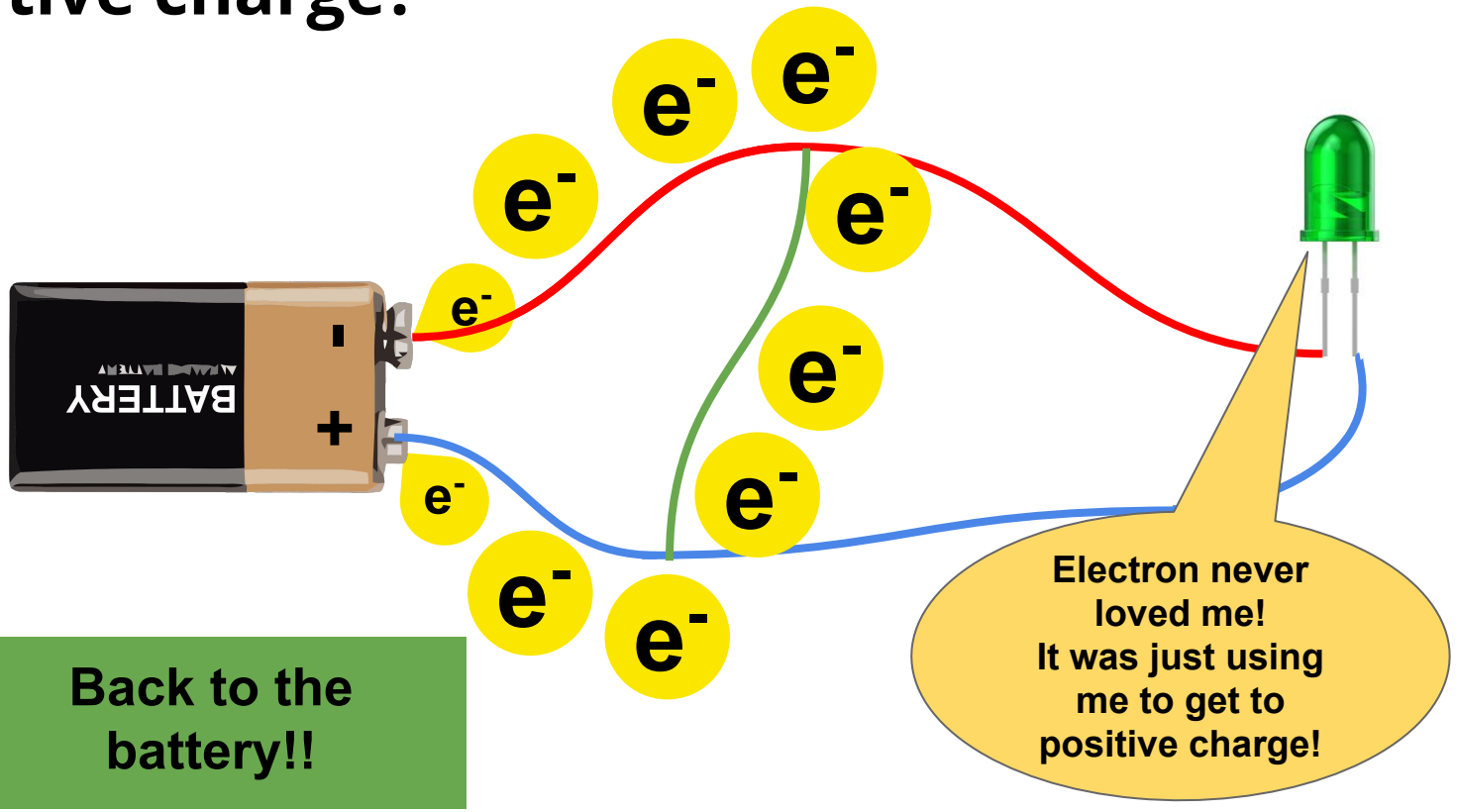
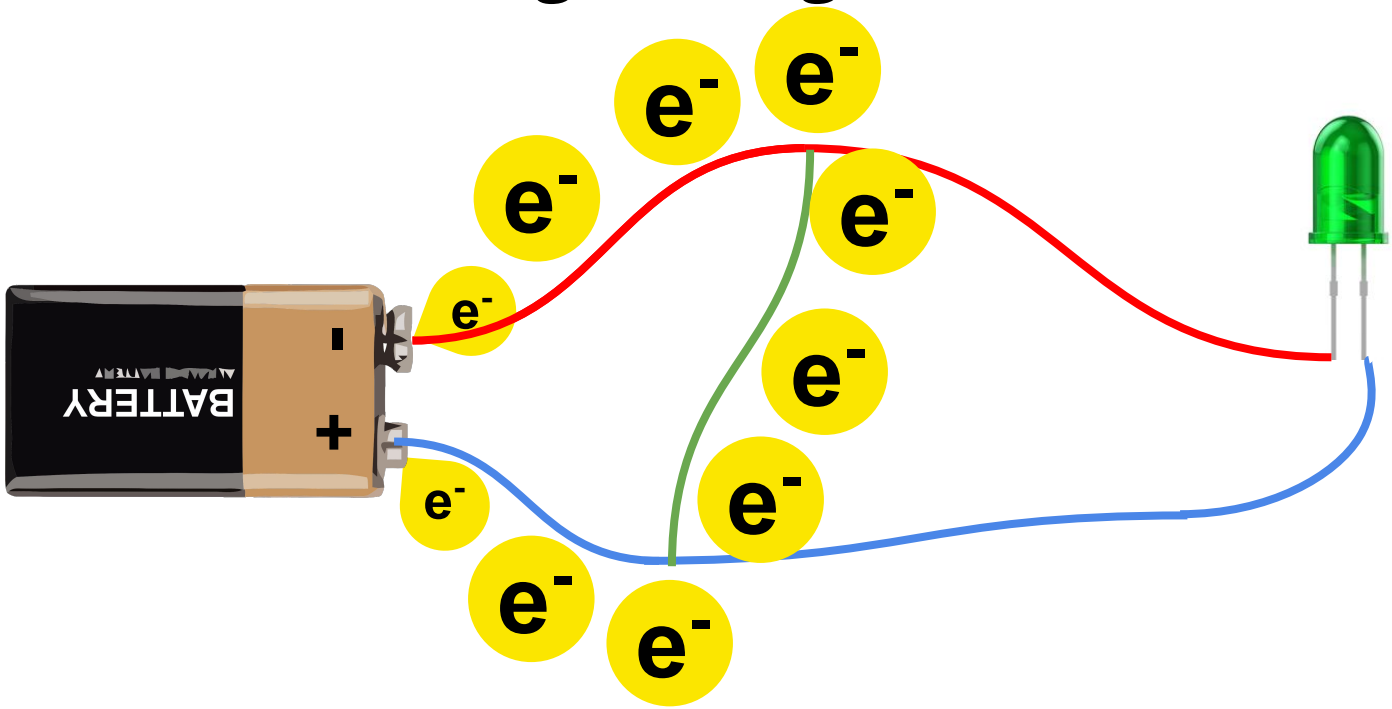


What is a circuit?

The short-cut path is <u>shorter</u> and doesn't have the <u>effort</u> of turning on a light, so it's <u>easier</u>!



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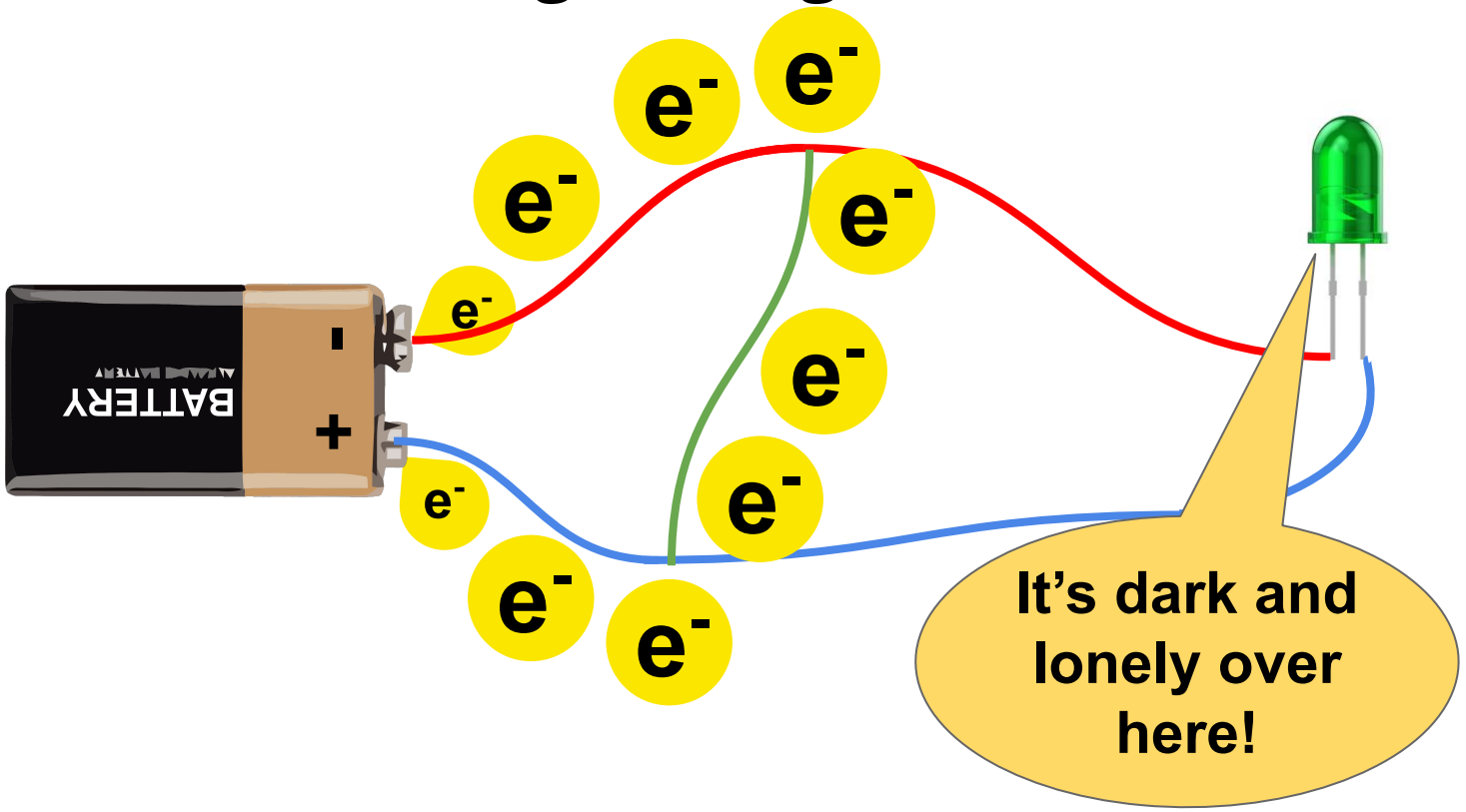


Let’s make circuits!

Today we’re going to make circuits!

Out of:

Batteries!

LEDs!

Play dough!

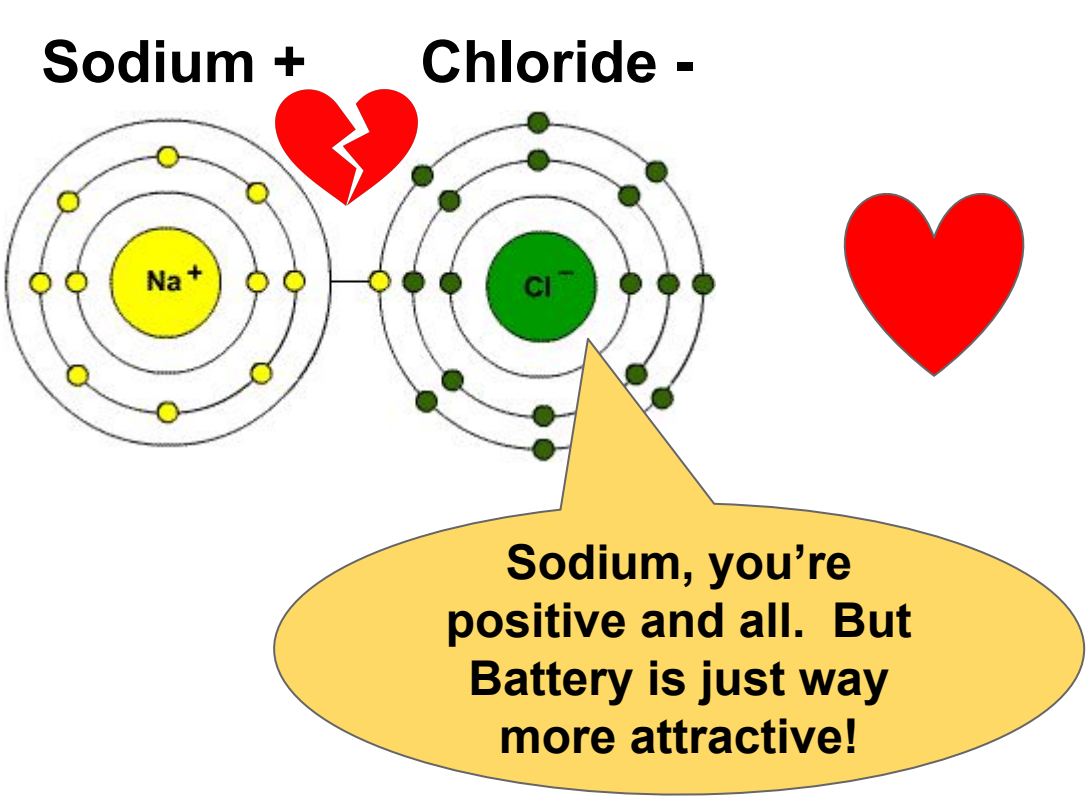
Let’s make circuits!

No wires! Just playdough!

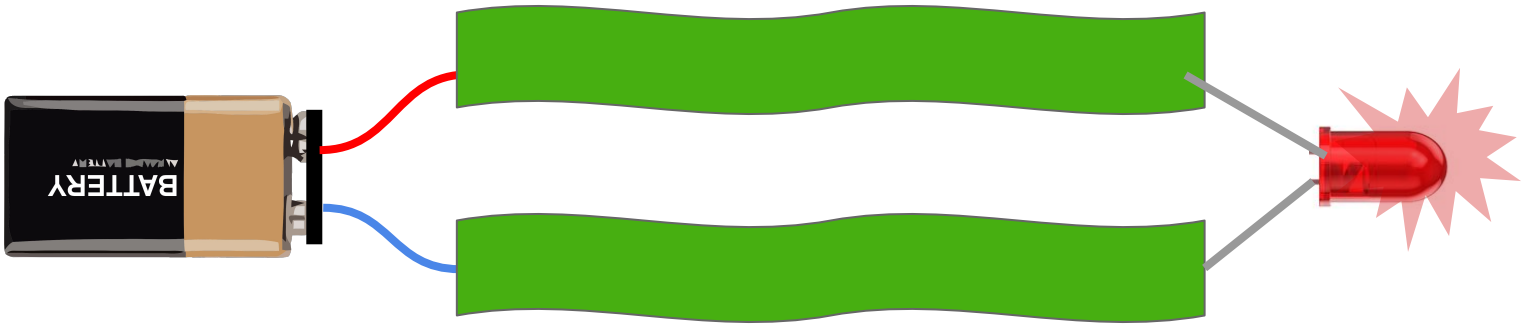
We can use play dough as wires, because it conducts electricity!

Let's make circuits!

Play dough is conductive because it's full of salt (NaCl)!



Basic Circuit



What are we making?

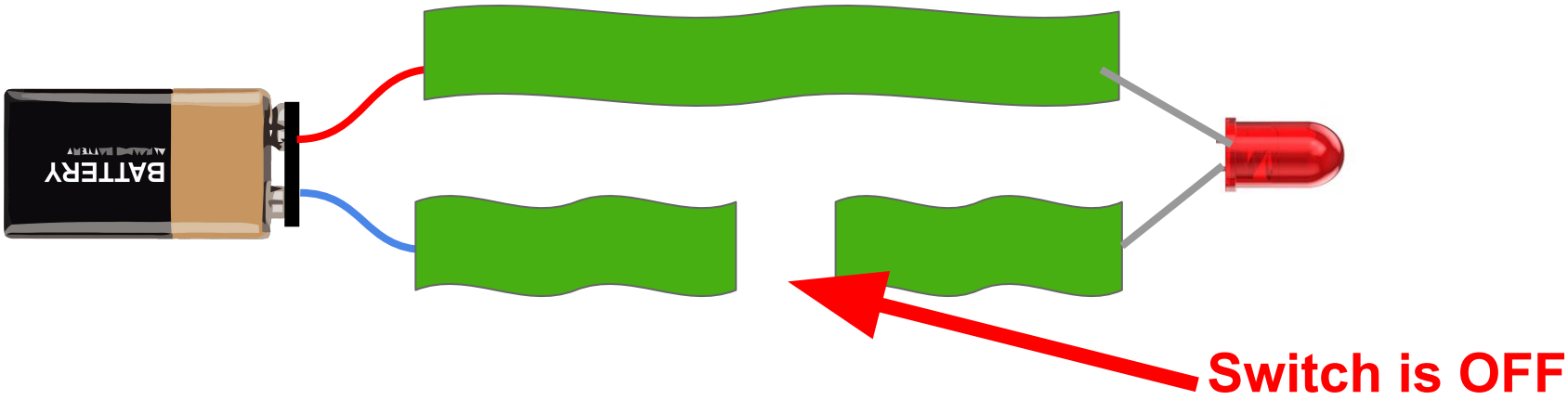
In the future computers will make all our decisions for us!

Then we can be as lazy as possible!

That's the dream!

What are we making?

We need to start teaching the computers how to make decisions for us based on information we tell it.



We can use our basic circuit for decision making by cutting the play dough and adding a switch!

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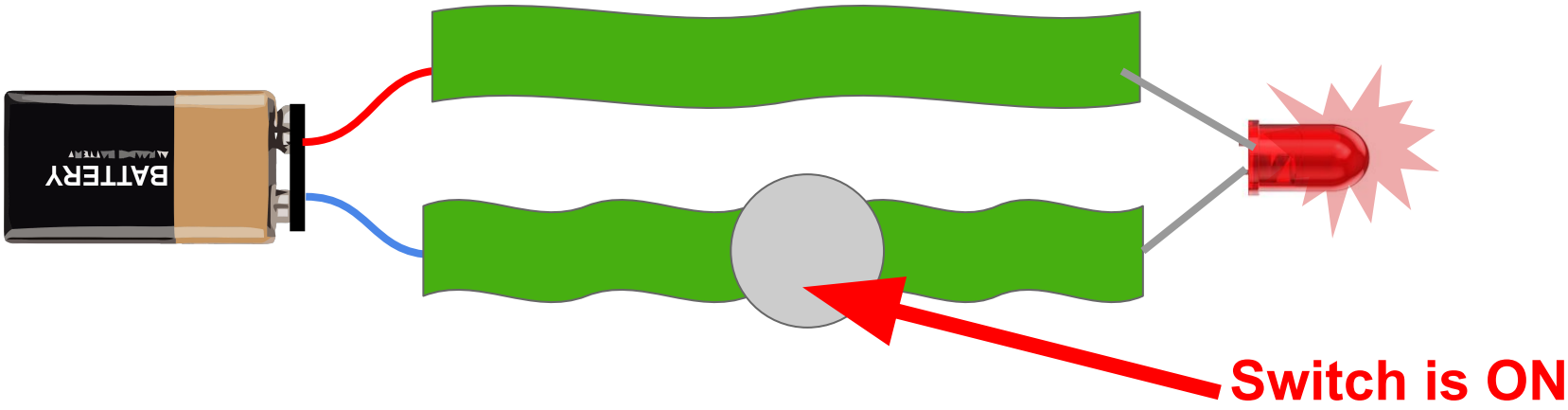
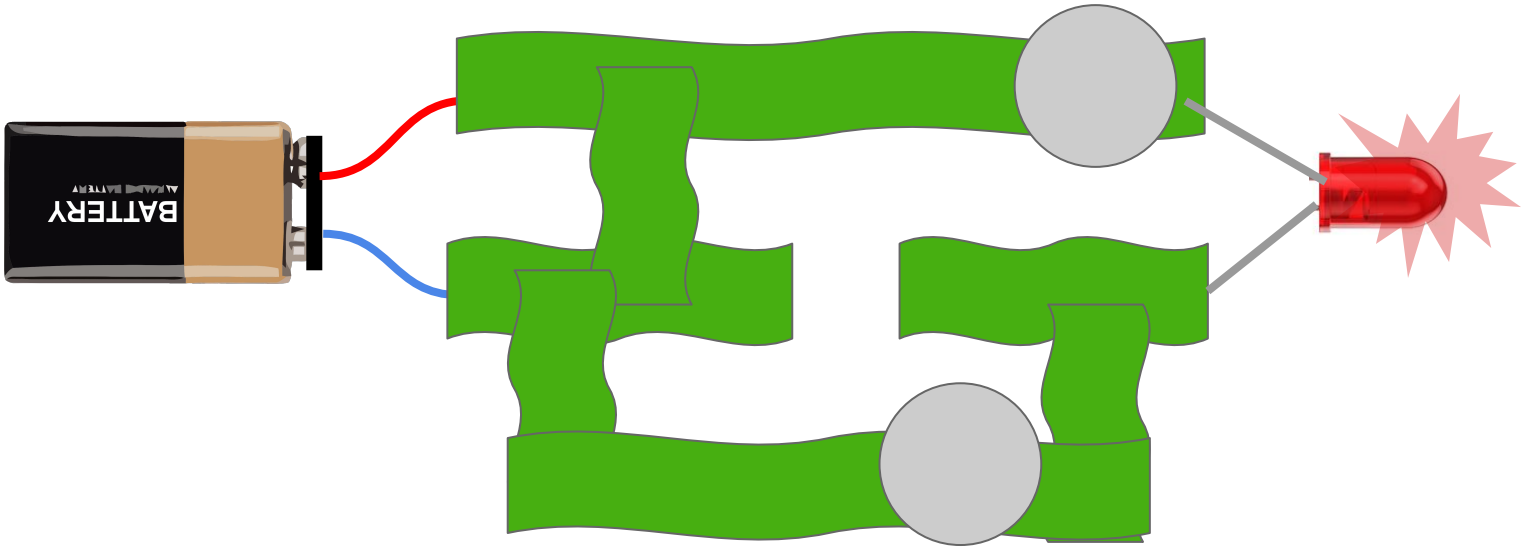


We can use our basic circuit for decision making by cutting the play dough and adding a switch!

What are we making?

We'll give you a bunch of scenarios to make a decision making machine for!

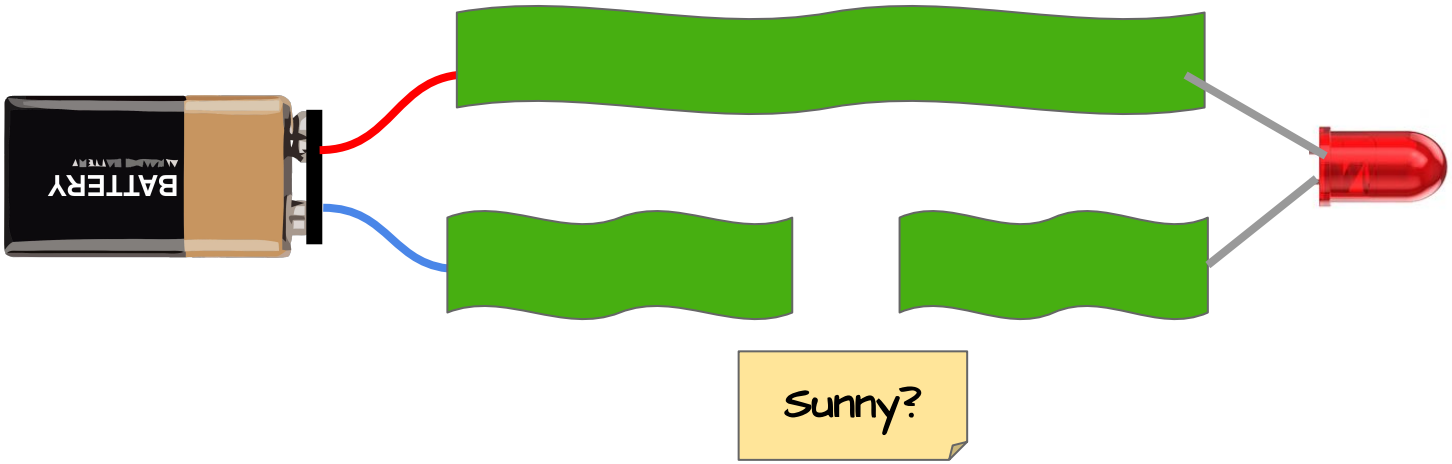


Add to, cut and deform you basic circuit to make the decision machines!

Example

Maddy likes to play netball. But only if it's not raining. Make a circuit that decides if Maddy plays netball, **the light should turn on** to tell mady to play netball.

If it's sunny Maddy has one token to put down on the circuit. Label the switch "Sunny?"



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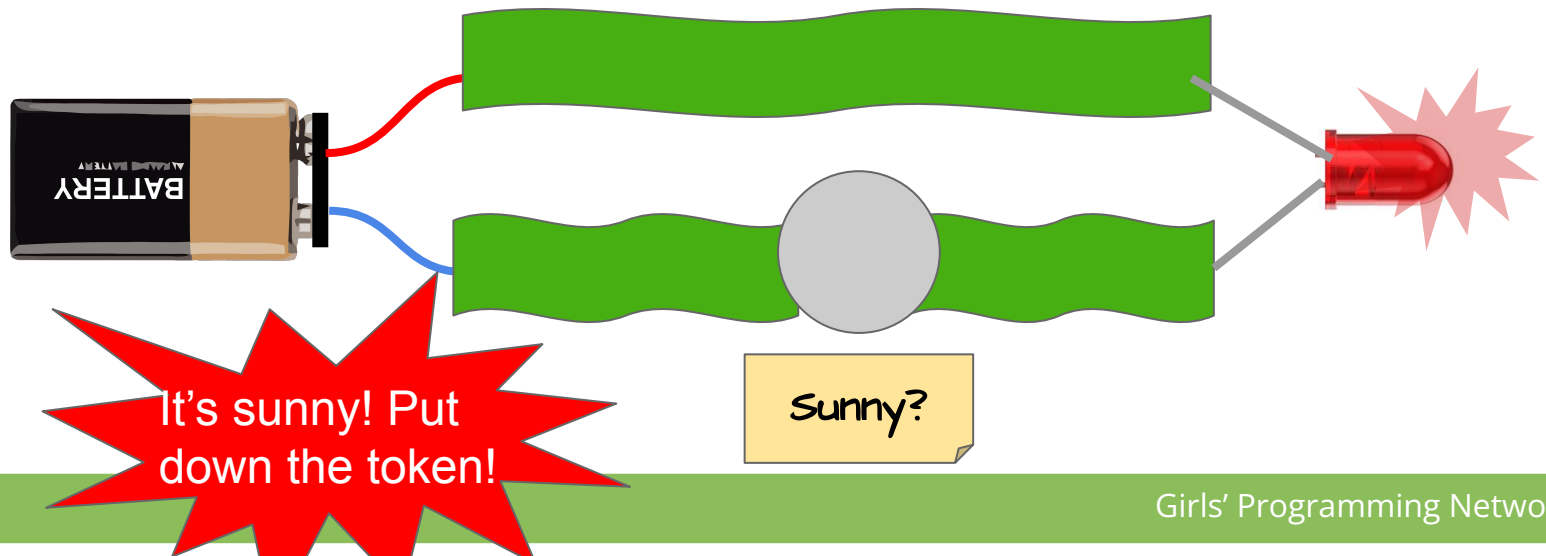

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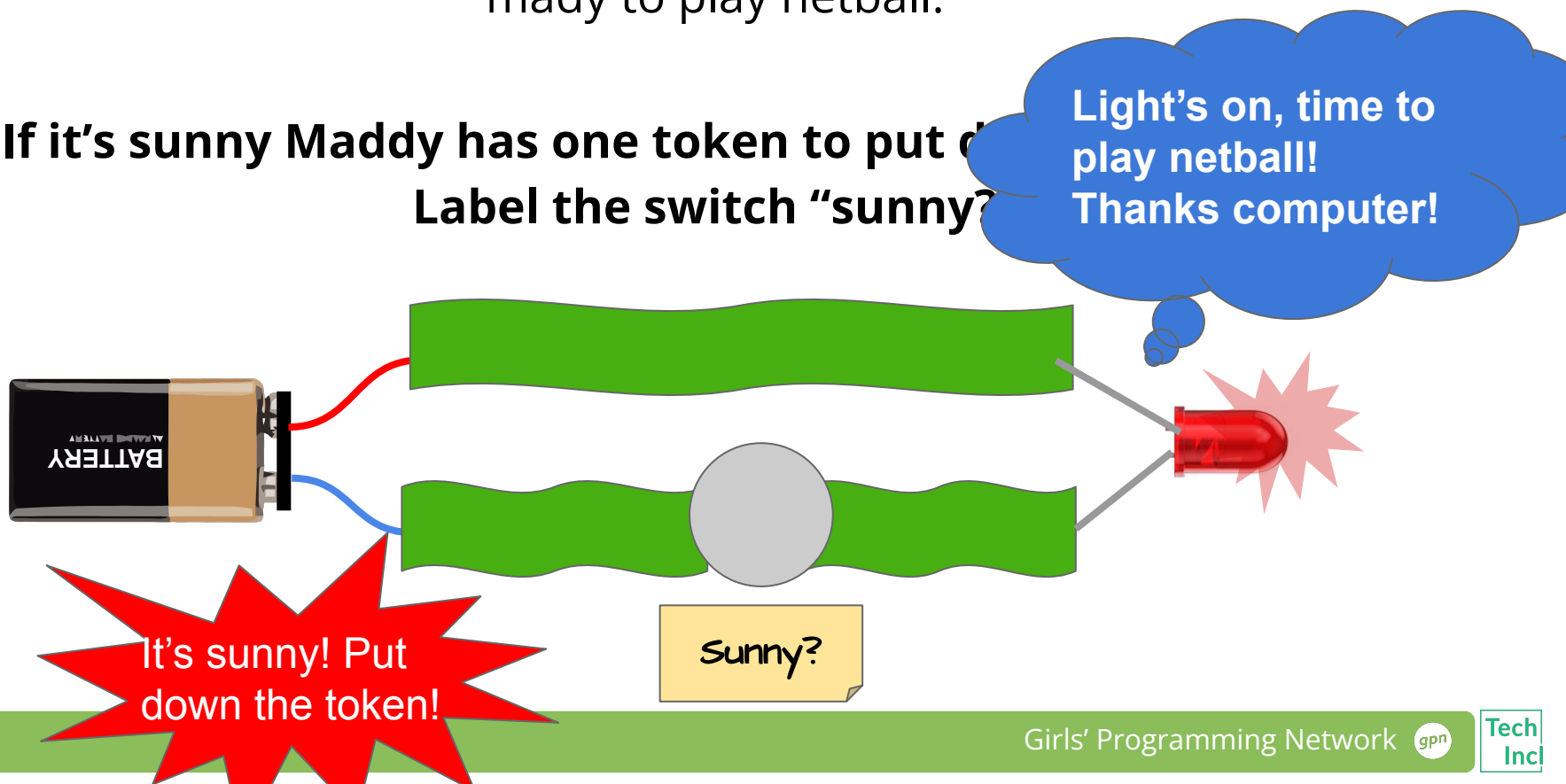


Logic gates!

The decision machines we're making are called logic gates.

You might have heard of some before like NOT, AND and OR, we use them in programming a lot!

You might have heard of some others like:

NAND

XOR

NOR

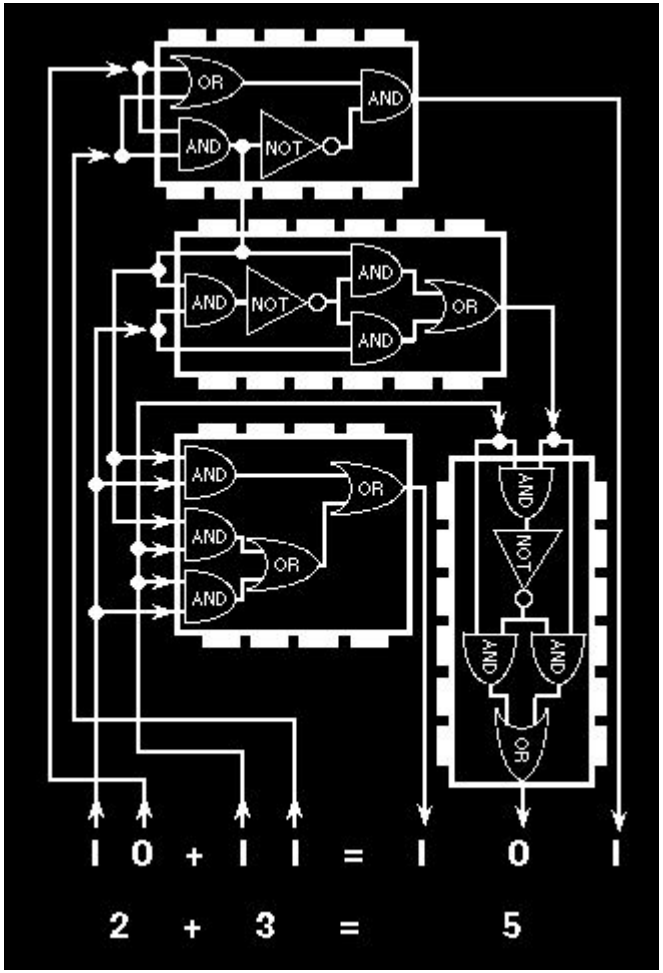
XNOR

Logic gates!

Programming is made up of lots of decision like this!

Your computer is made up of millions of logic gates.

Logic gates are the building blocks of the computer's ability to add numbers up!



Let’s make the world a lazier place!

With less decision to make, there’s more time to have fun!

Tips!

- Don’t make your playdough wires too thick
- Don’t make your wires too long
- Squish your switches into the play dough if they’re not working
- LEDs **don’t work backwards**, try it the other way around.

Safety

No metal to metal connections!

Metal -> to playdough

Metal -> Metal