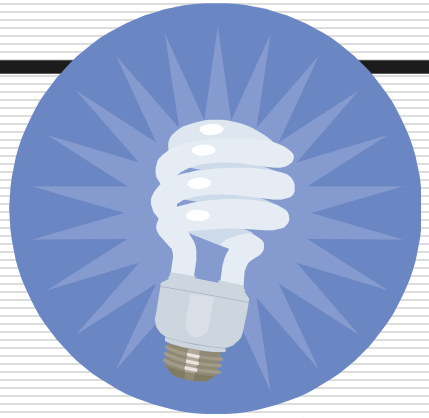
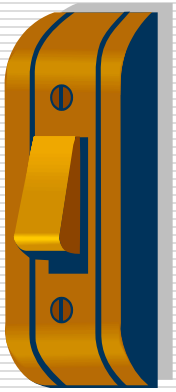
This PPT has important notes on electrical symbols. Please copy all notes into your notebook so that we can use this information later.

Electrical Symbols and Circuits

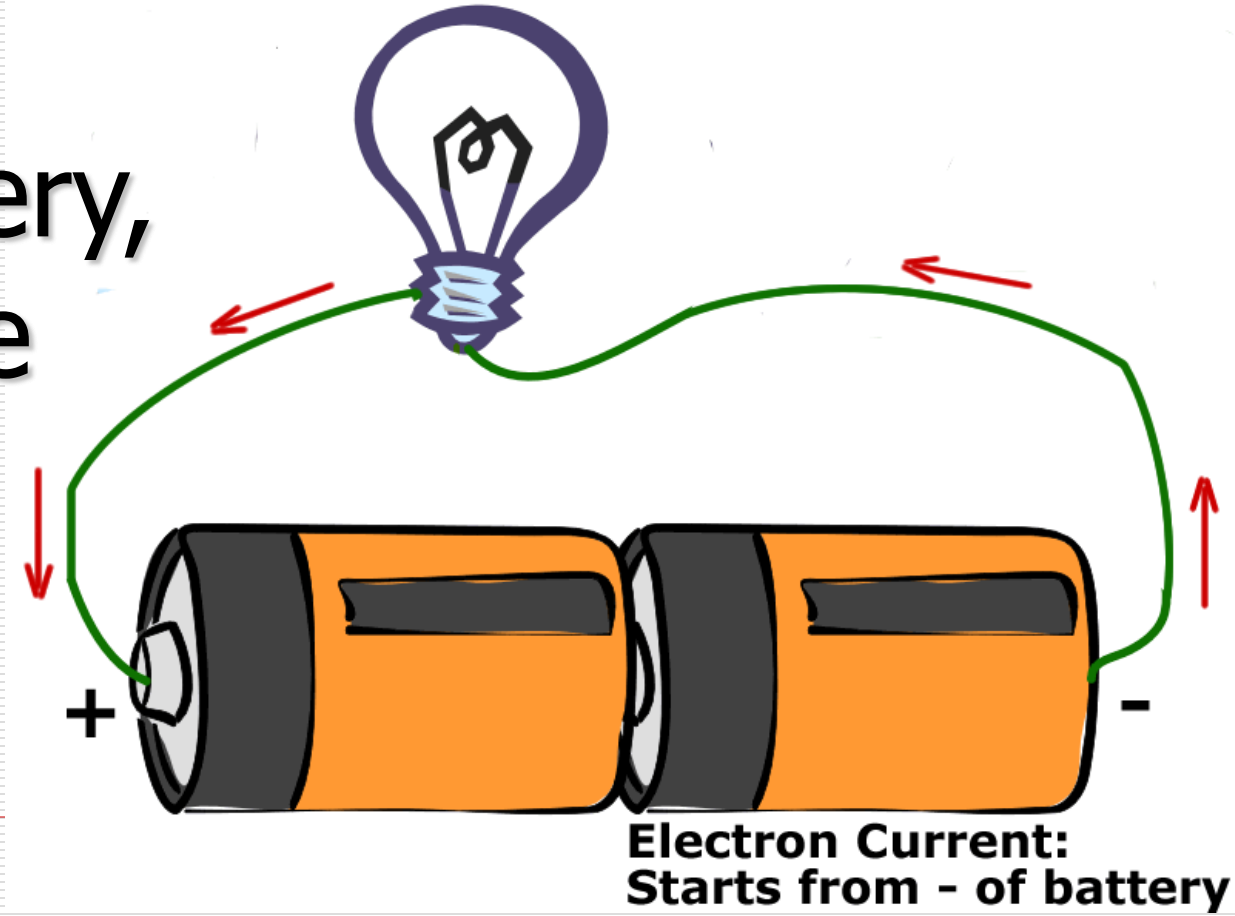




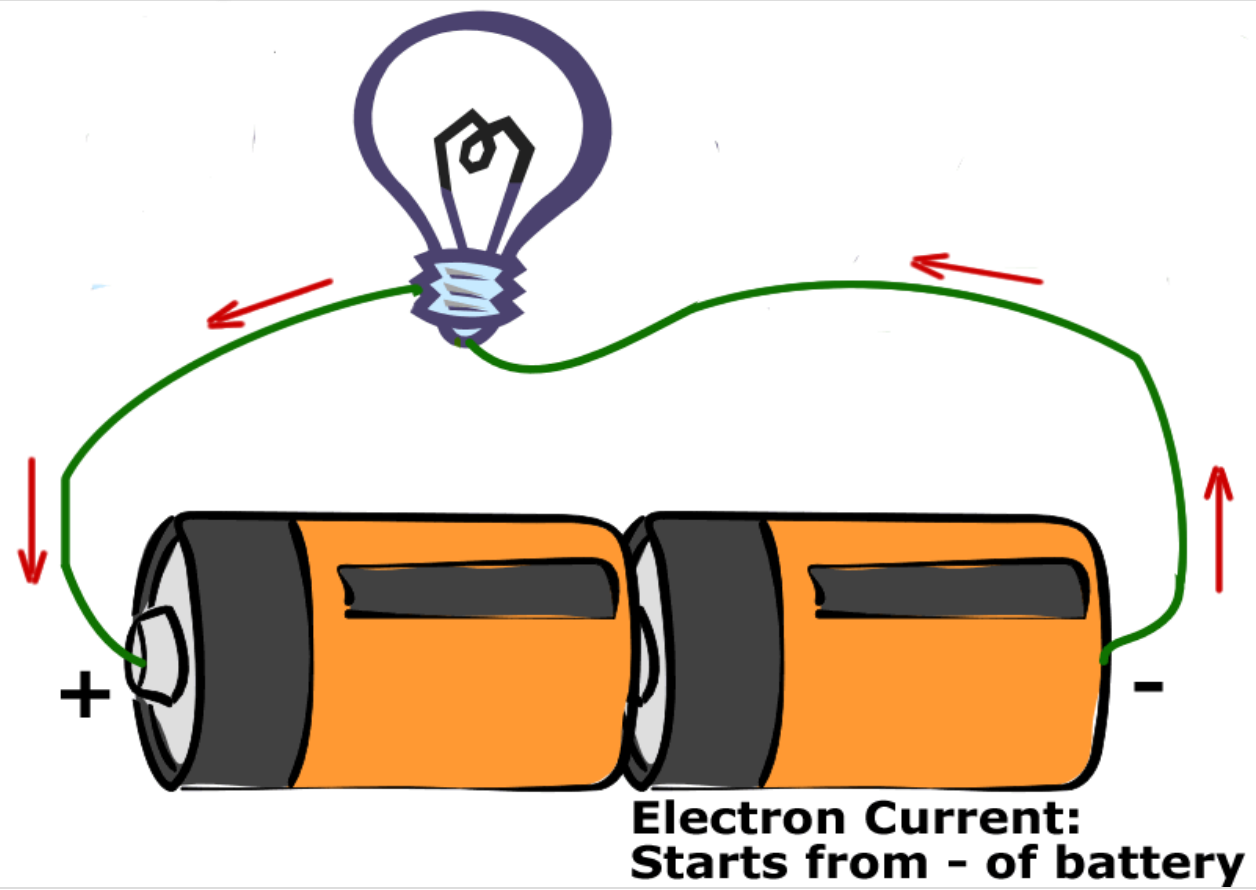
By Laura Zinszer
DHS 2016

Closed Circuits

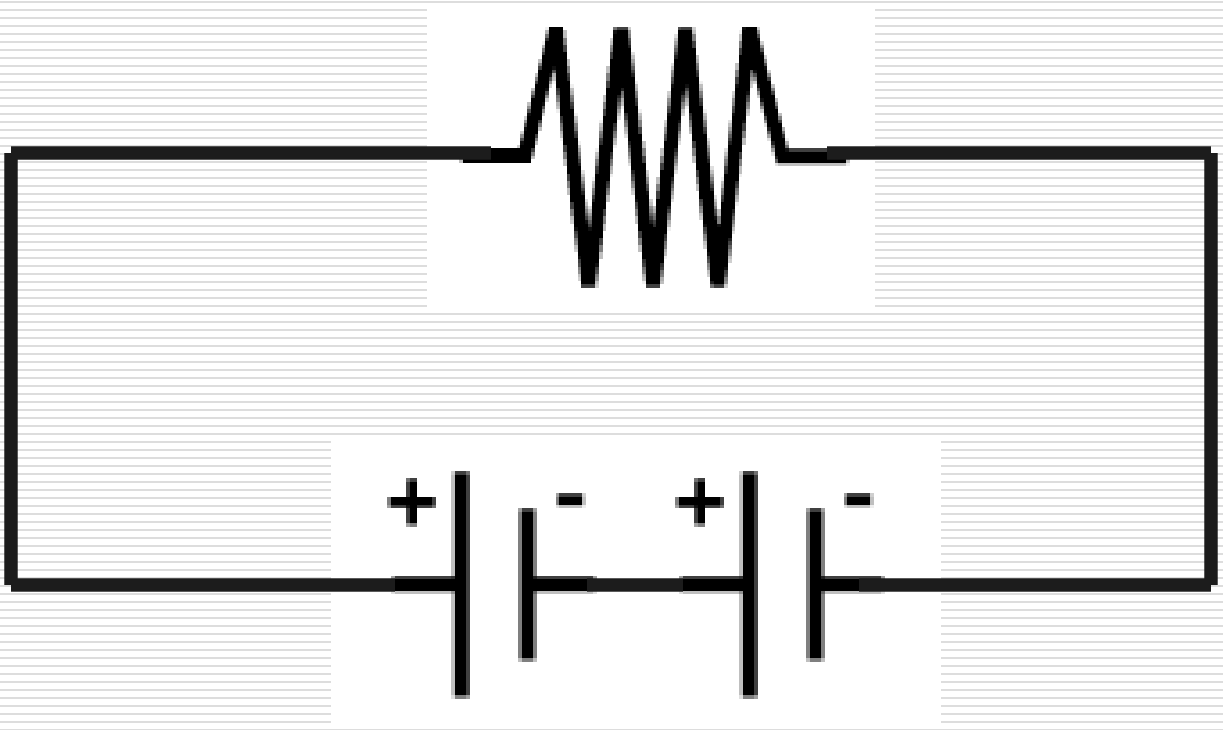
Closed Circuits have a complete & unbroken pathway of electricity from the – of the battery, through the bulb and back to the +.



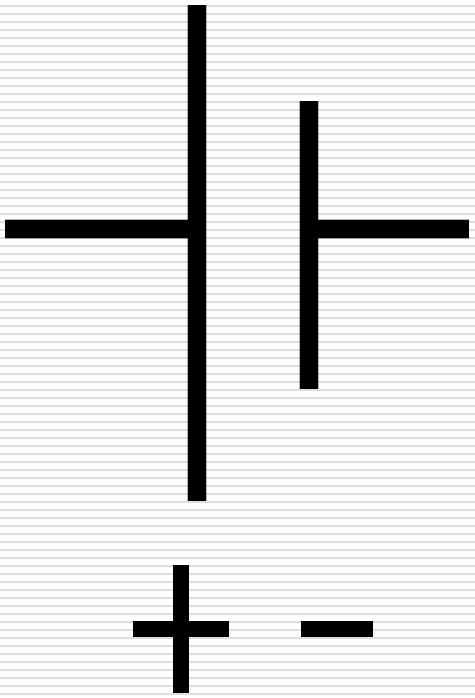
If we drew this circuit, the drawing would take too long and may not be clear to the observer.



So we use symbols to represent each part of the circuits we create.

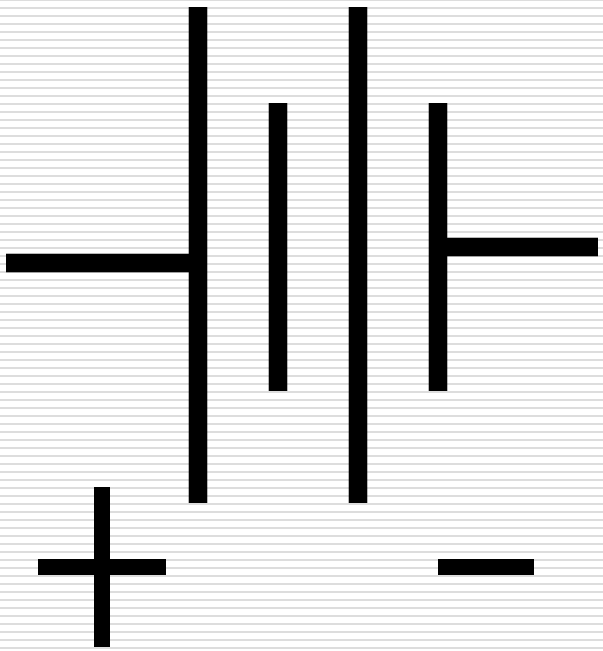


Battery



- The long line represents the + terminal and the short line represents the – terminal.

Battery

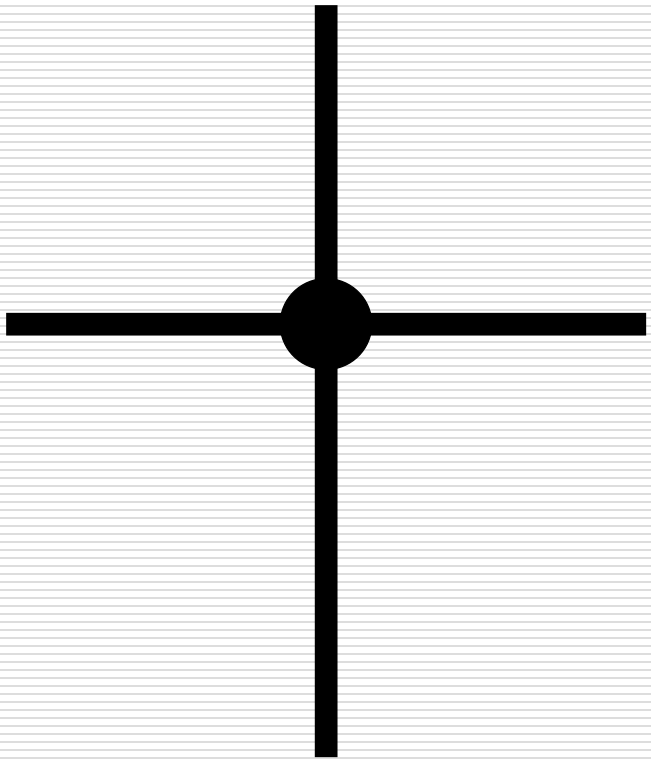


- Sometimes we might see a battery with multiple cells.

Wire

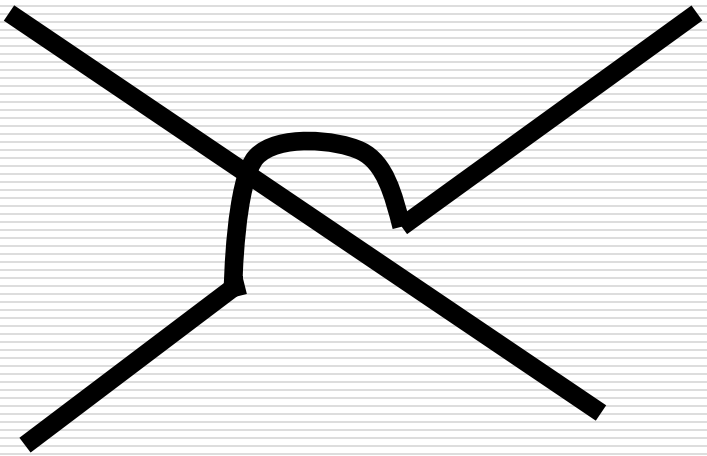
- A wire is represented by a single straight line.

Wires connected



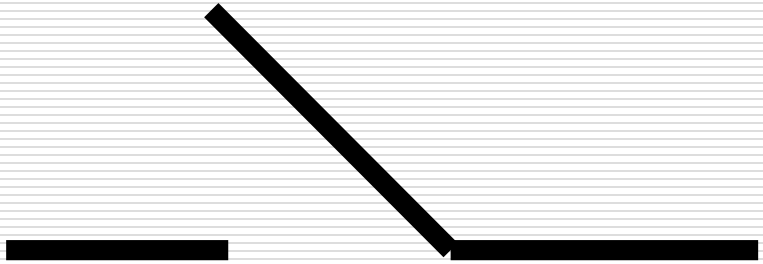
- A dot represents the connecting point for these 4 wires.

Wire Crossing



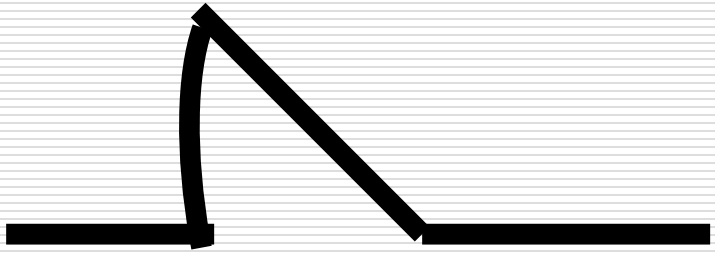
- If two wires cross, one wire will be drawn that curves over the other.

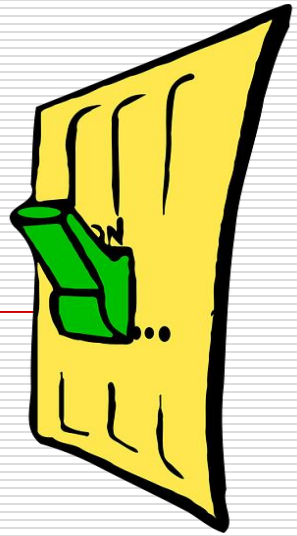
Switch



- An open switch when the circuit is **off**.

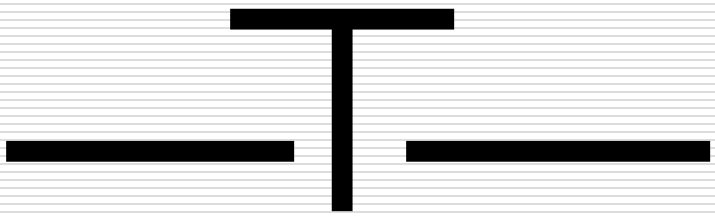
Switch





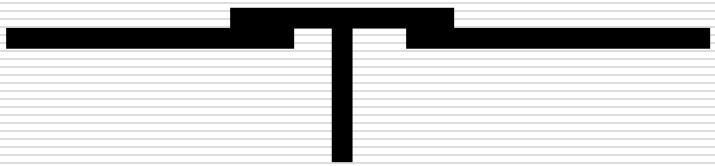
- A closed switch when the circuit is **on**.

Push Button Switch

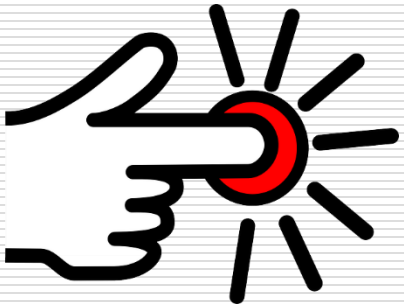


- An open switch when the circuit is **off**.

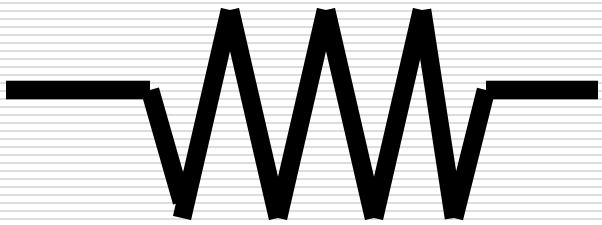
Push Button Switch



- A closed switch when the circuit is **on**.

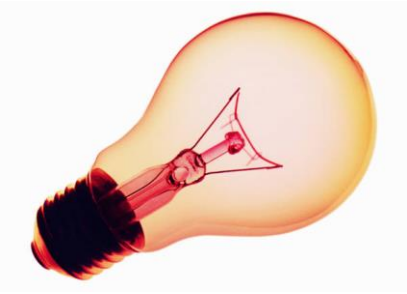


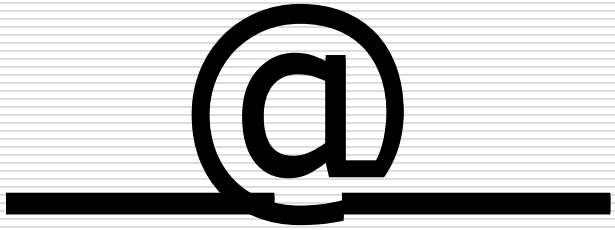
Resistors



- Resistors are signified by this symbol.

Lamps

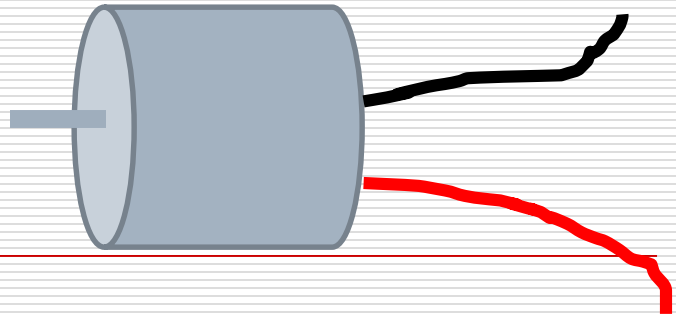


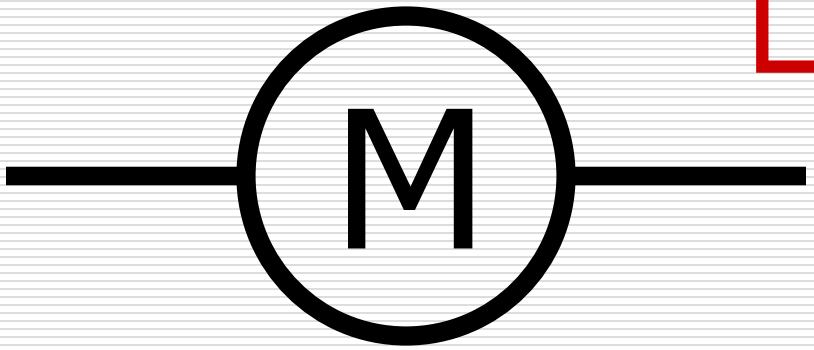


or

- Lamps use an ampersand in a circle with two connectors or the resistor symbol.

Motors

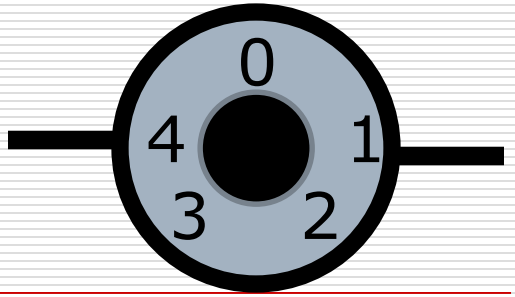


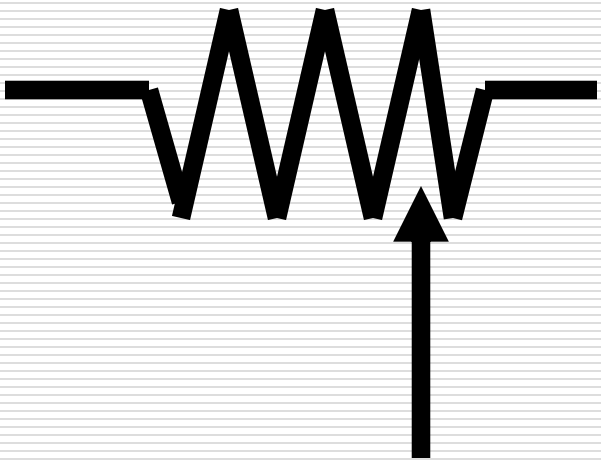


or

- Motors show the M in a circle with two leads or the resistor symbol.

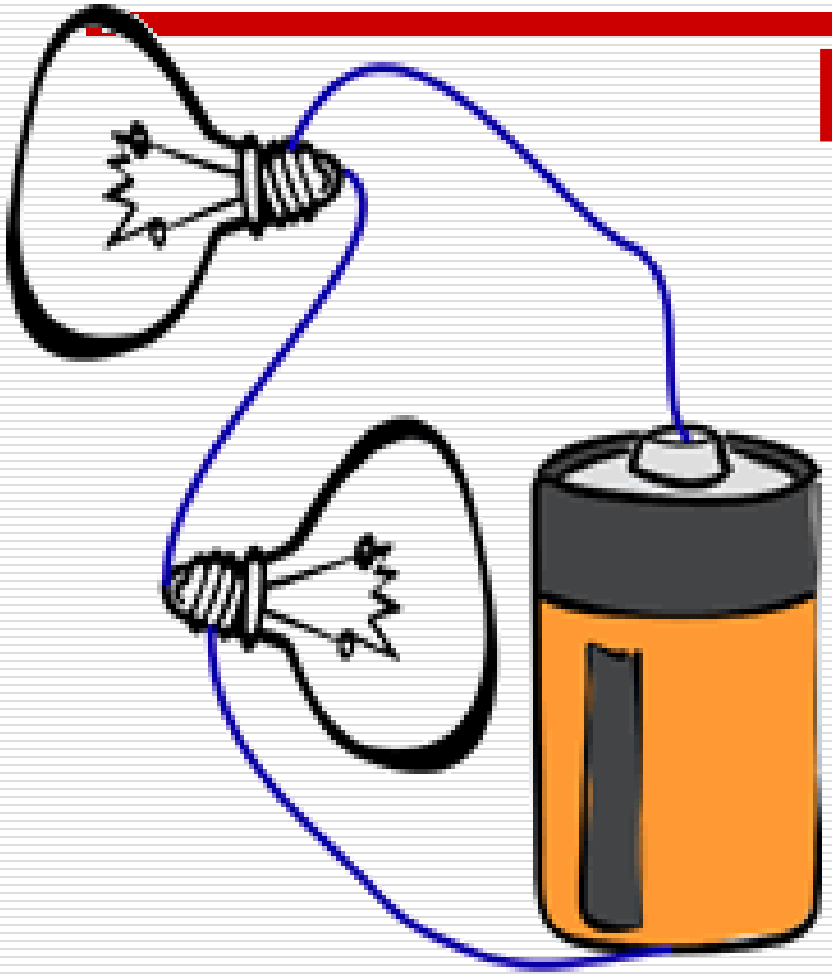
Potentiometer





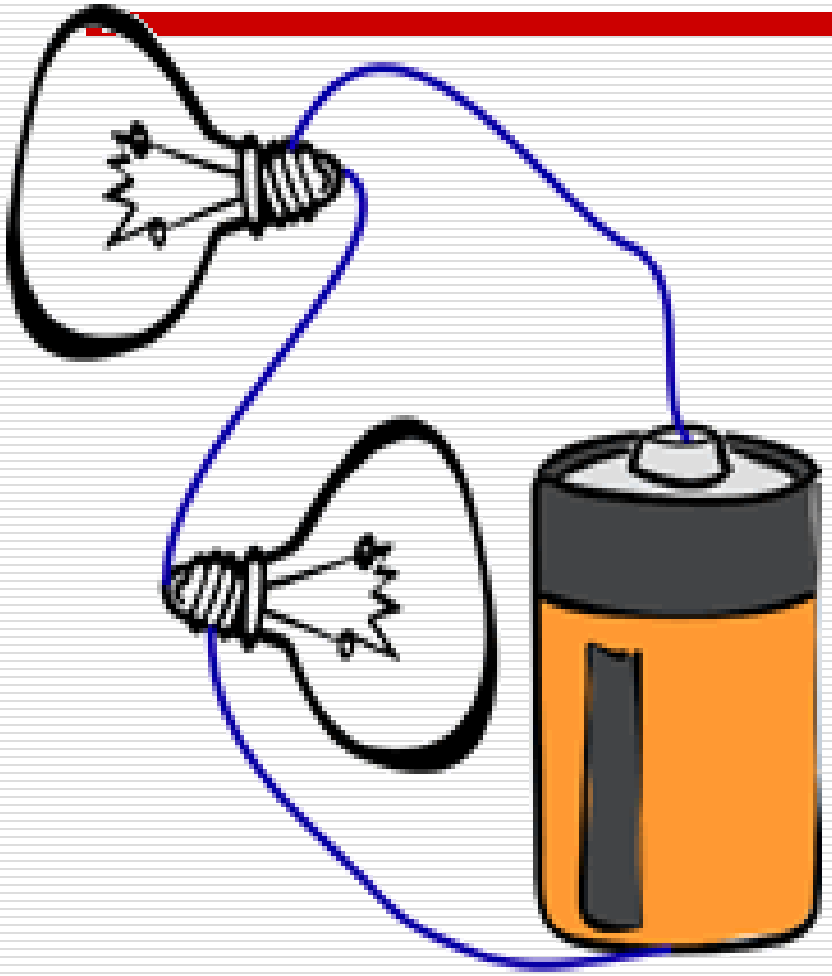
- An arrow is placed below the resistor symbol represents the change in resistance on the dial for a potentiometer.

SERIES CIRCUIT



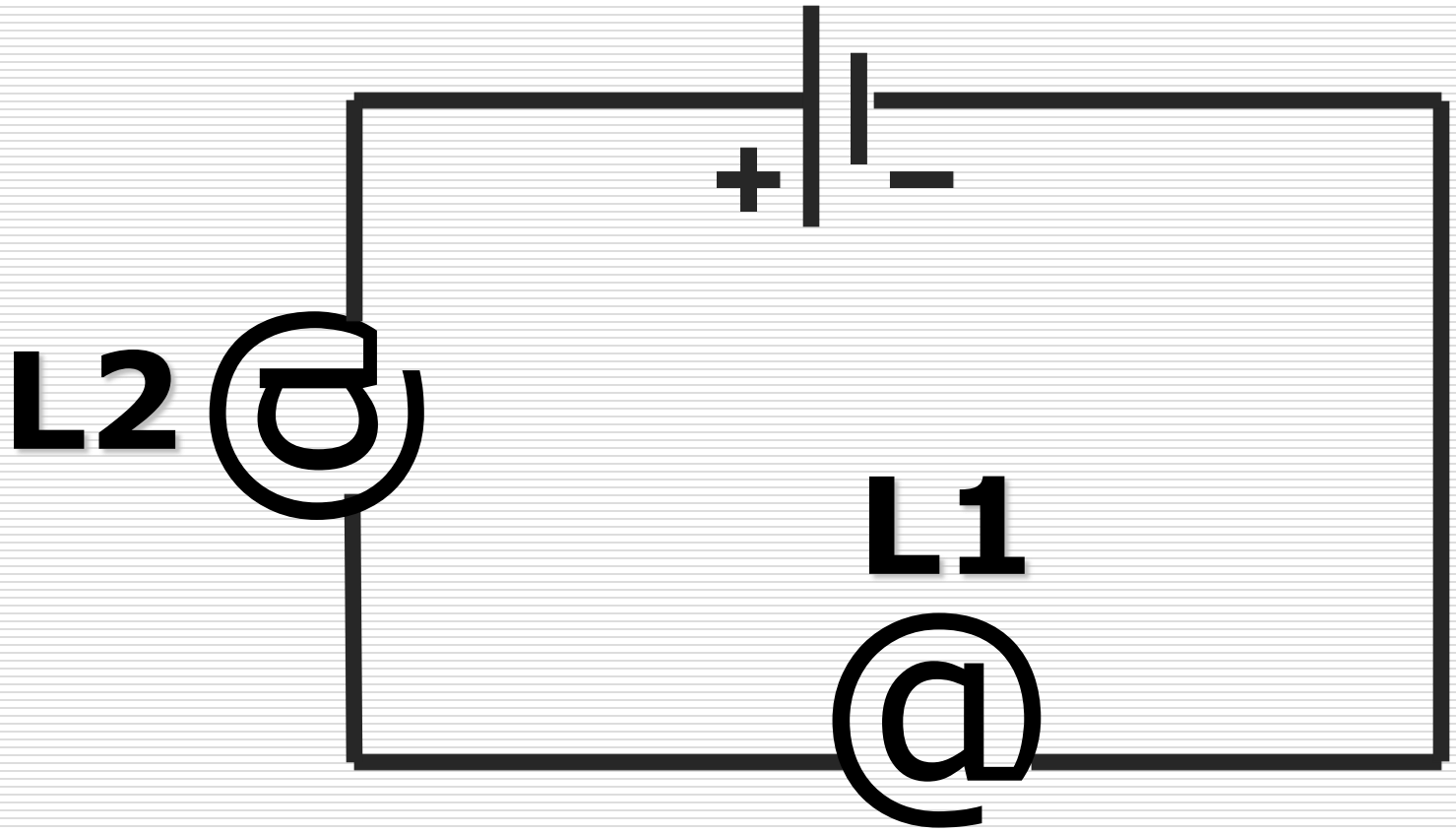
- This series circuit includes 2 bulbs, 3 wires and 1 D cell battery.

SERIES CIRCUIT



- Draw what this circuit would look like using resistor symbols…

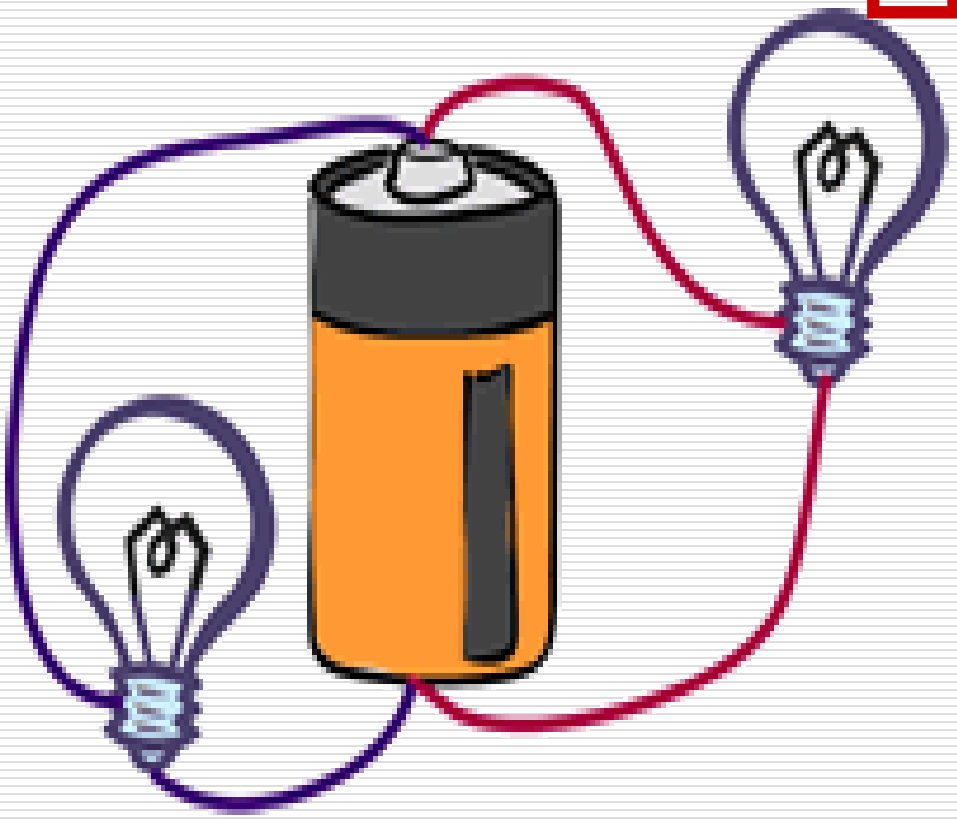
SERIES CIRCUIT



SERIES CIRCUIT

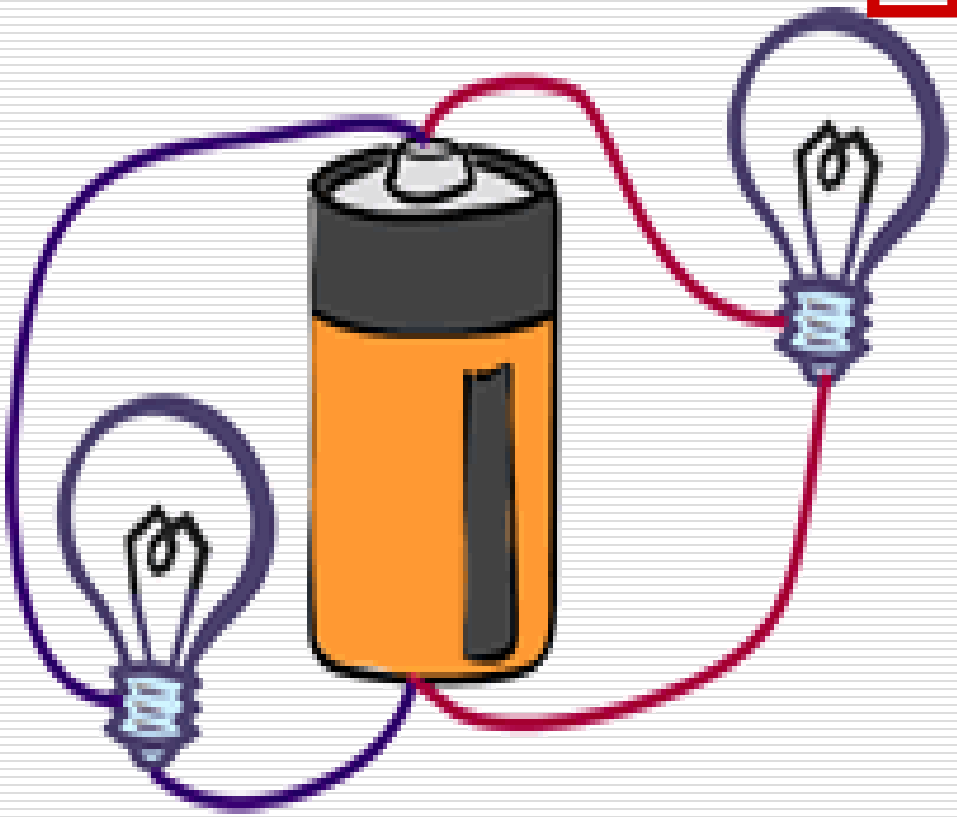
- Single path of electricity
- When 1 light goes out, all go out
- Add more resistors, all lights get dimmer

PARALLEL CIRCUIT



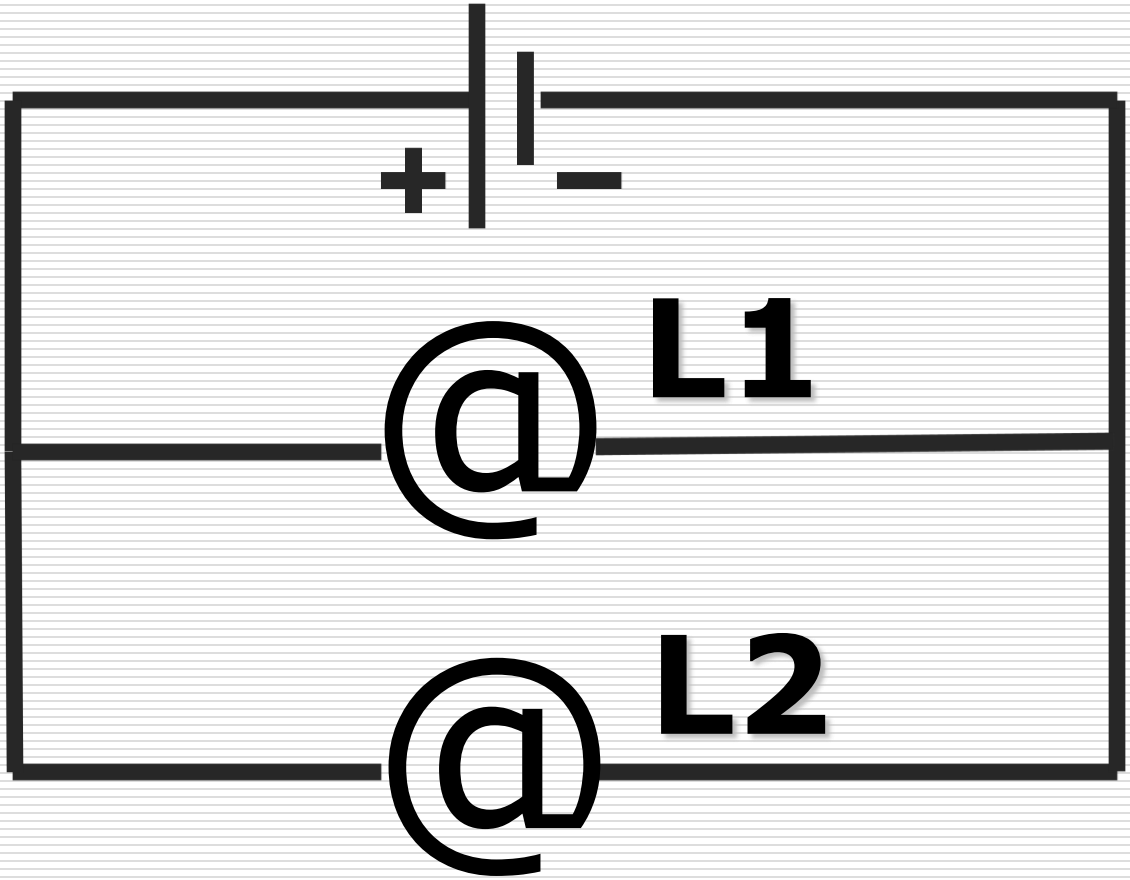
- This parallel circuit has 2 bulbs, 4 wires and a battery.

PARALLEL CIRCUIT



- Draw what this circuit would look like using resistor symbols…

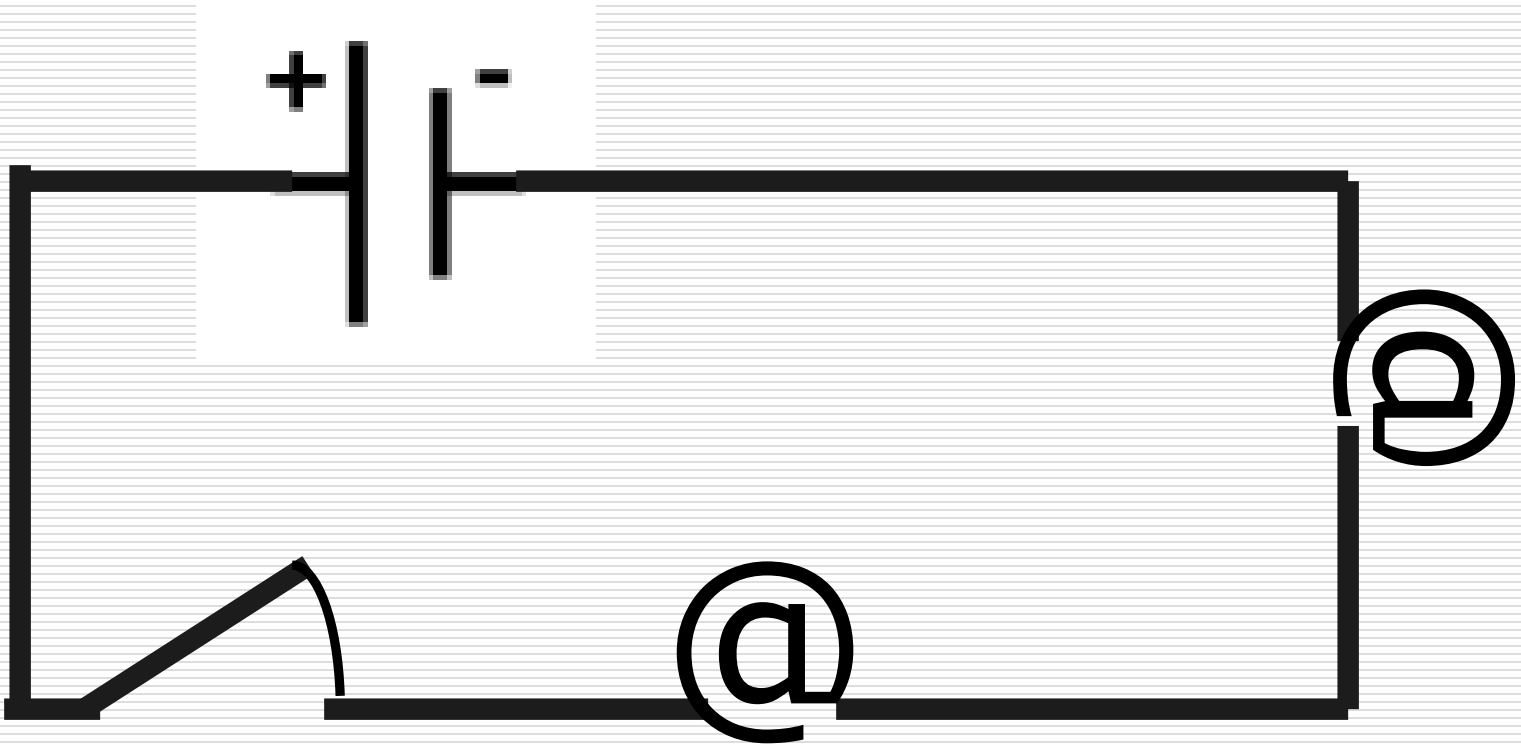
PARALLEL CIRCUIT



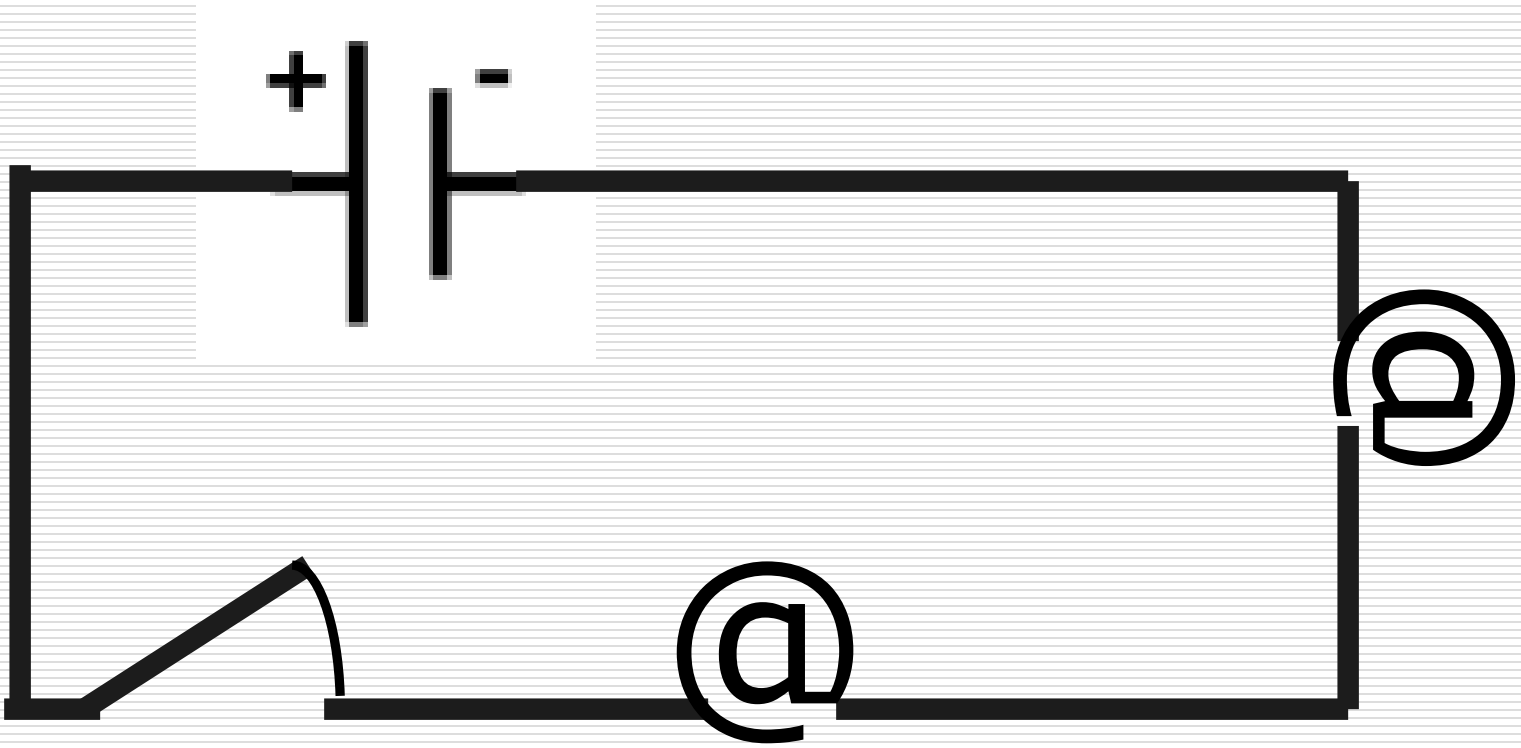
PARALLEL CIRCUIT

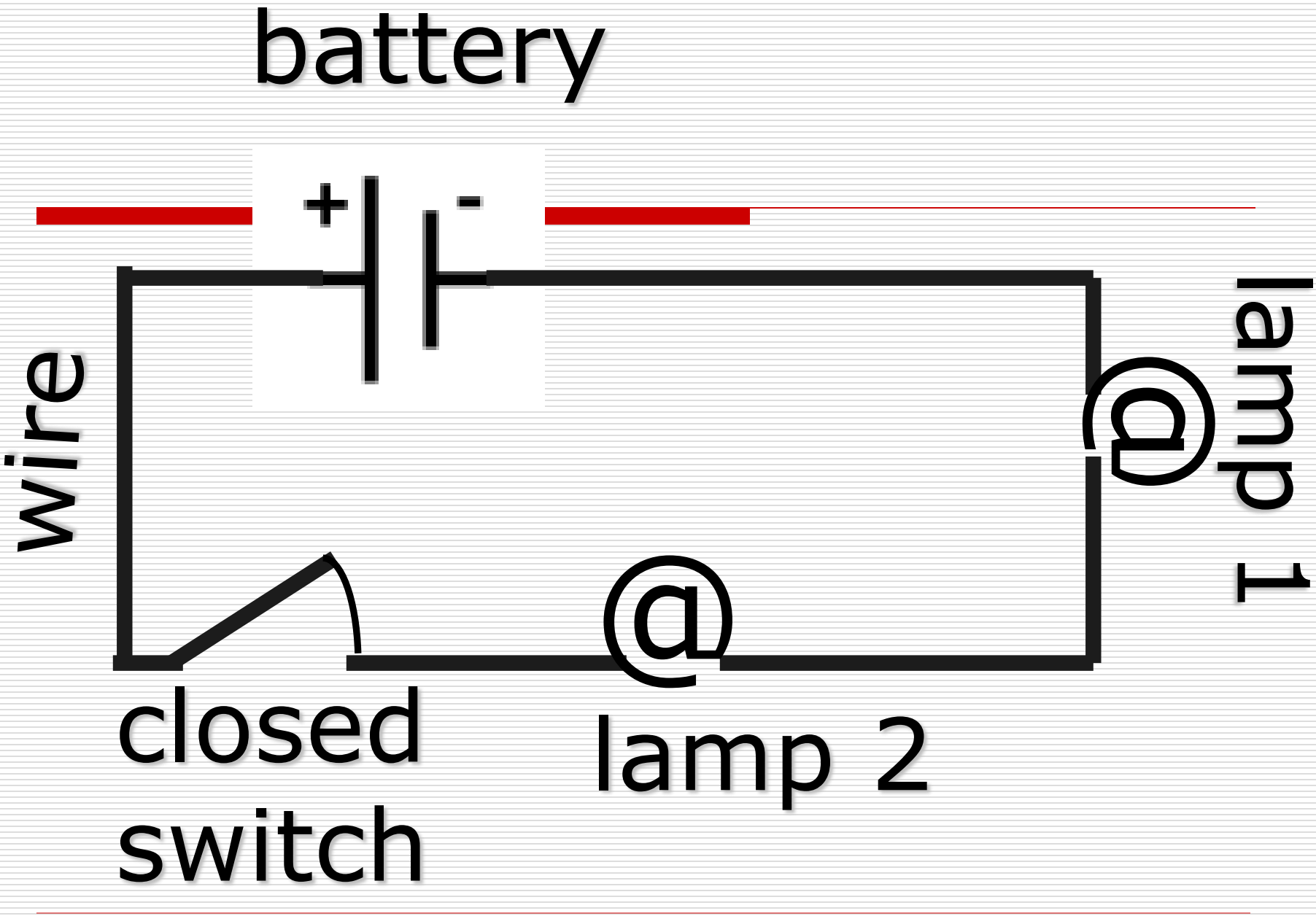
- Many paths of electricity
- When 1 light goes out, the rest stay on
- Add more resistors, brightness decreases only imperceptively.

Draw this circuit in your NB

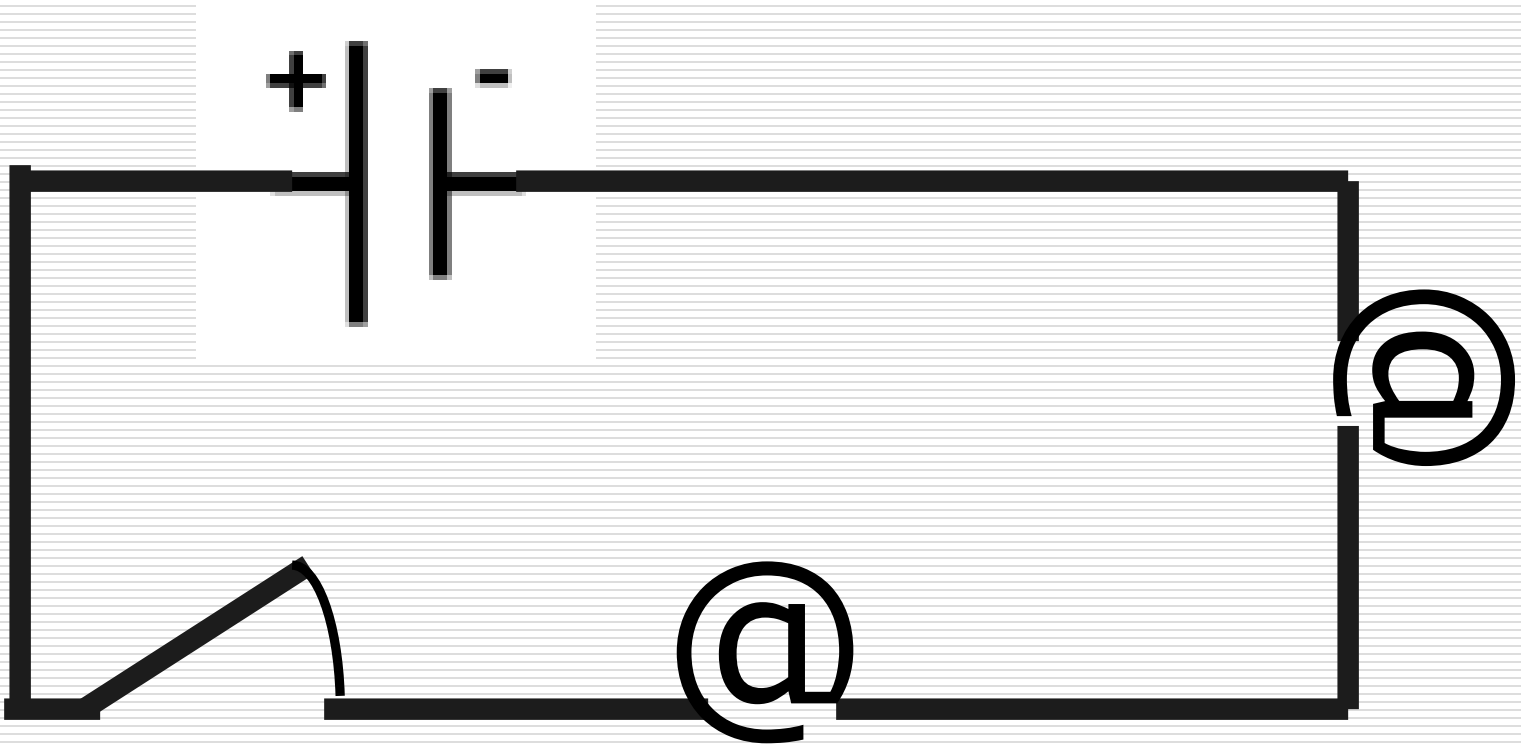


What are the parts of this circuit?

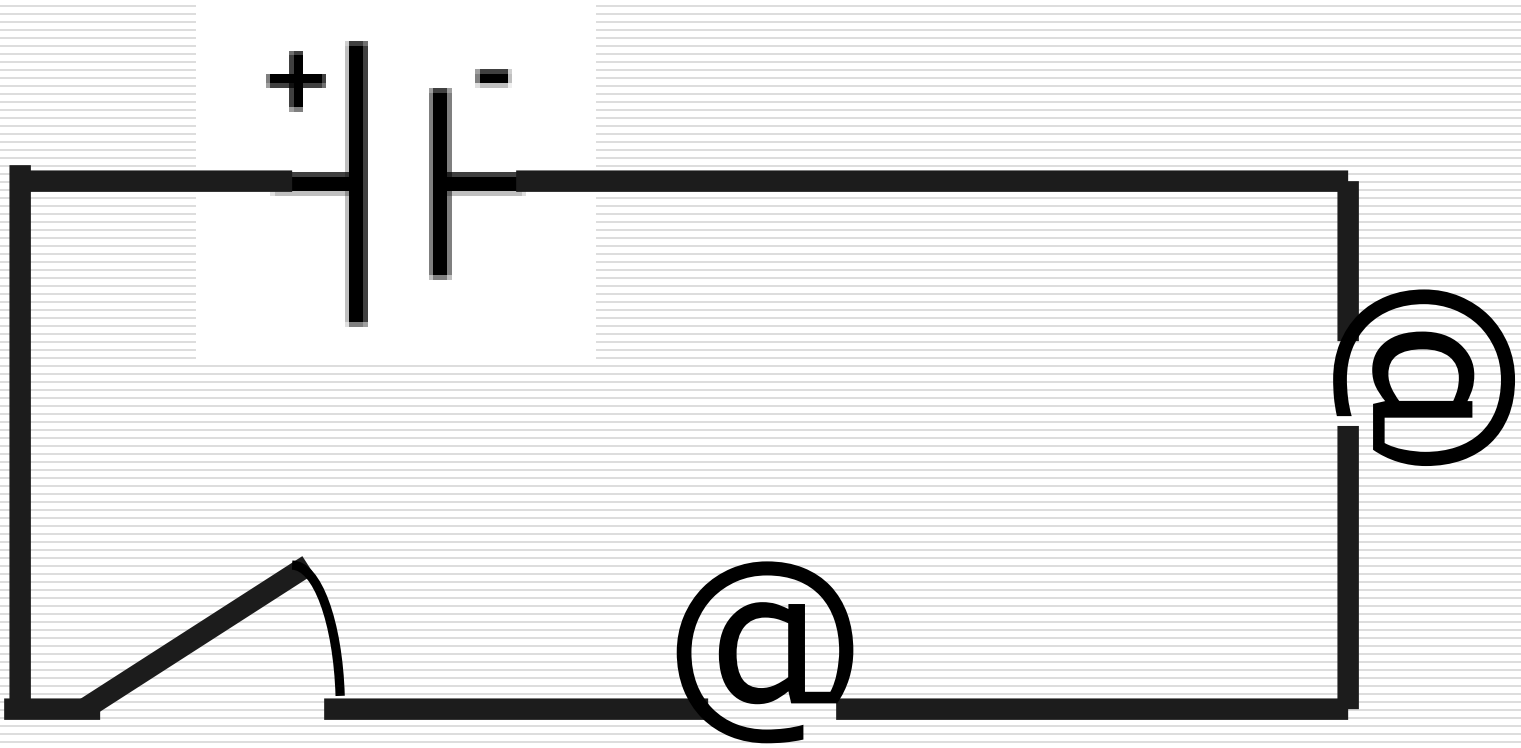



battery
+
-
wire
lamp 1
lamp 2
closed
switch

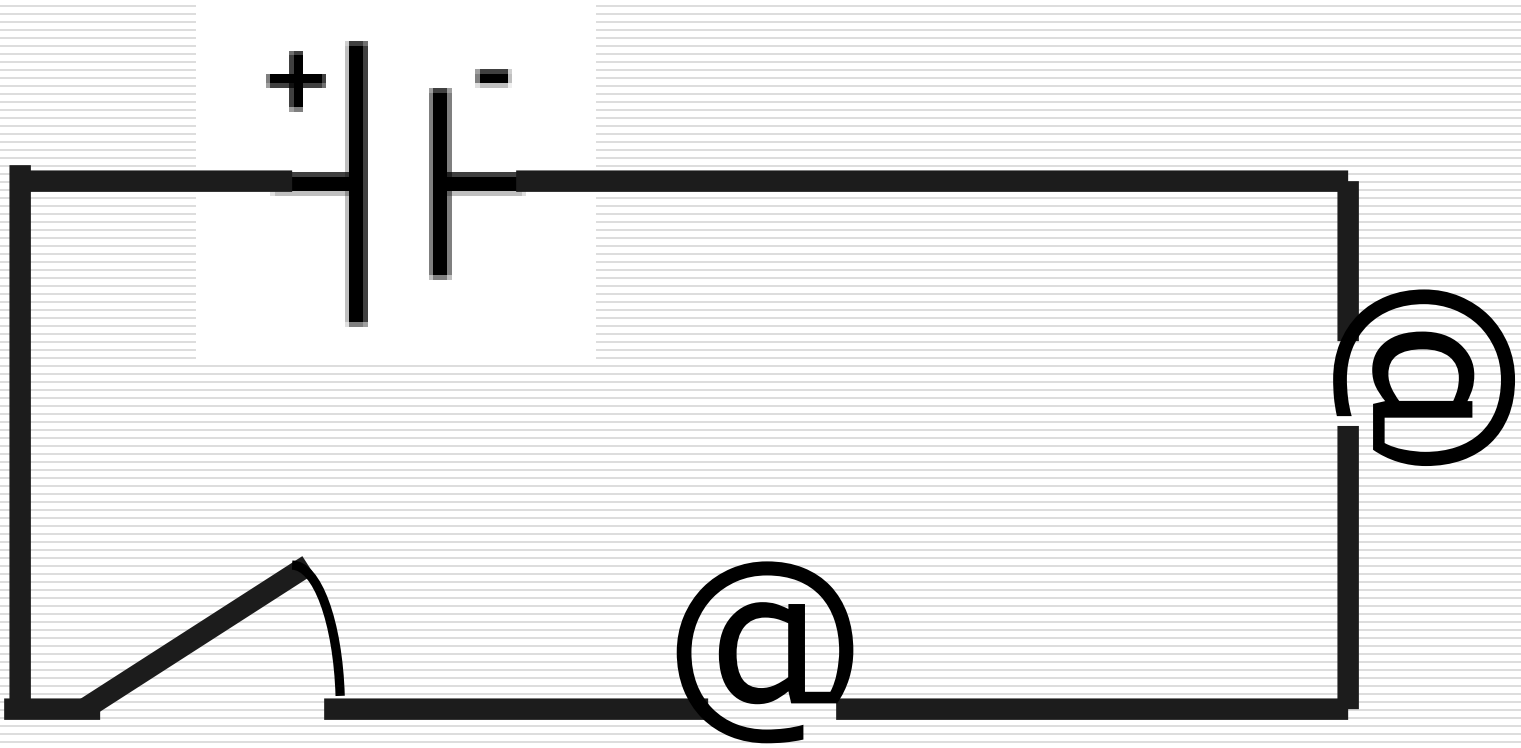
Is this circuit Series or Parallel?

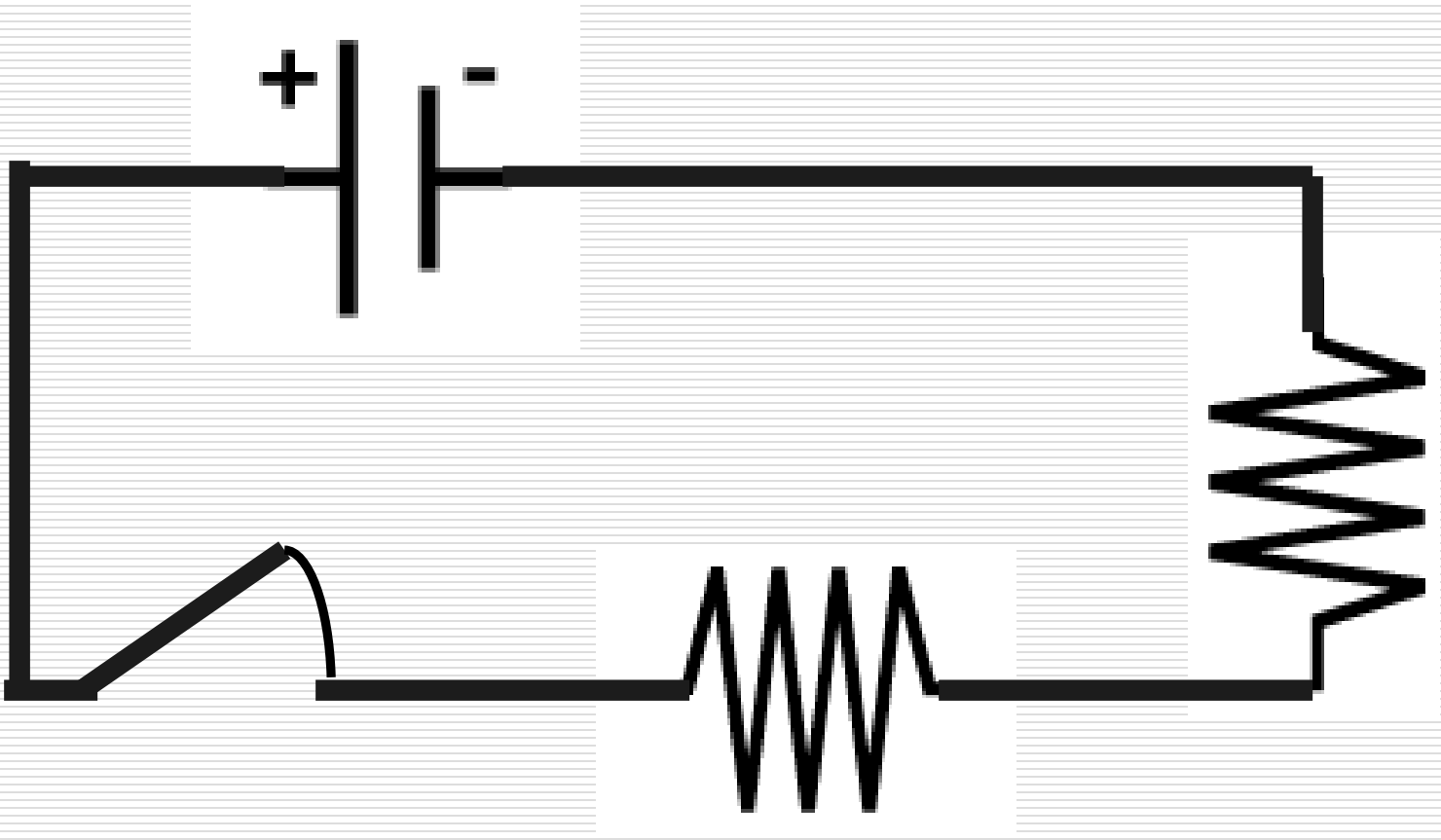


Series…How do you know?



Series…because there is only one path of electricity.





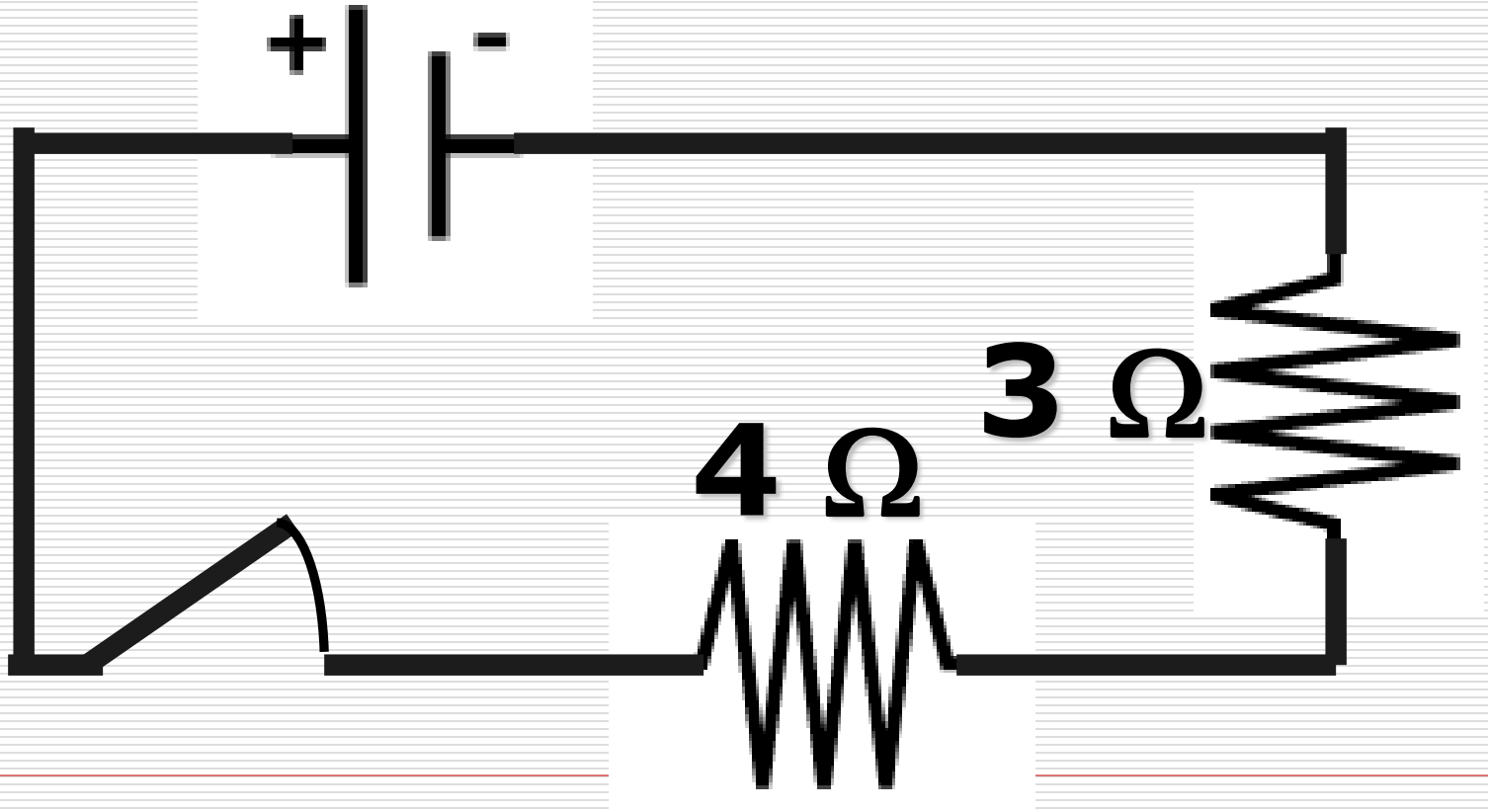
Adding Resistors

In a series circuit, all of the resistance can be added up…

$$R_{total} = R_1 + R_2 + R_3 \ldots$$

Adding Resistors

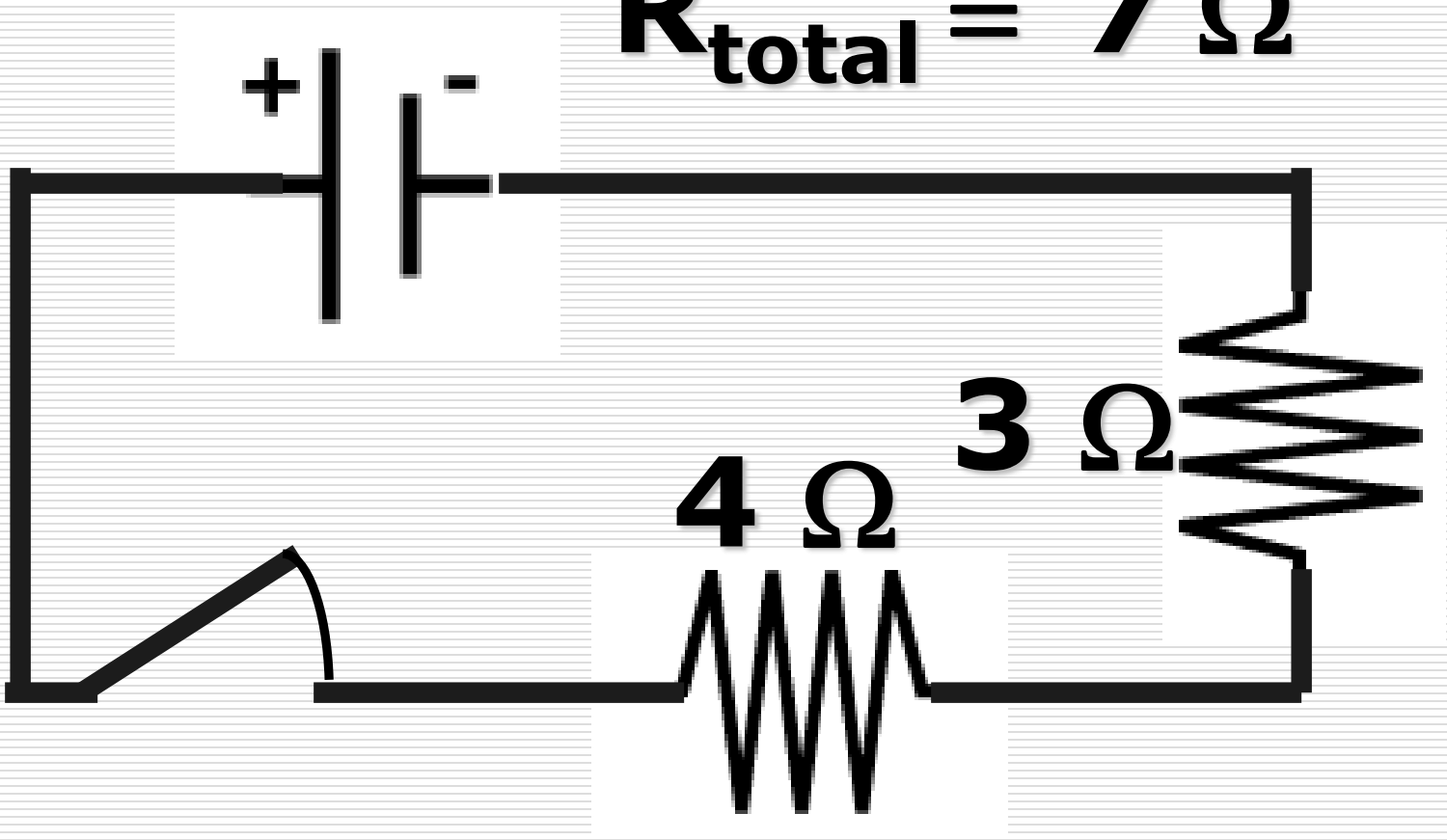
This total resistance is…



$$R_{total} = R_1 + R_2$$

$$R_{total} = 3\,\Omega + 4\,\Omega$$

$$R_{total} = 7\,\Omega$$



Please complete the **Adding Resistance HW** It is due tomorrow.