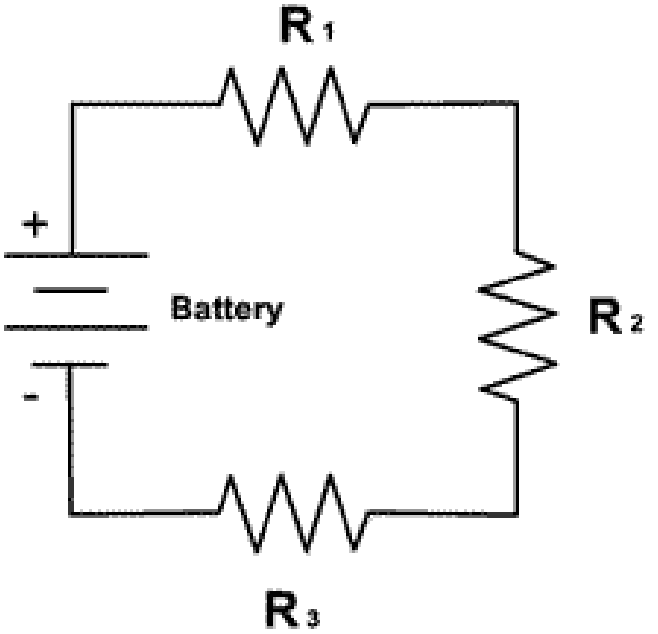
Curiosity, Connections, and Creating Value

Exercise #1

Charlie Coleman

What types of electrical and non-electrical systems may be modeled using resistors and dependent sources?

- Traffic is one such system that can be modeled using resistors and dependent sources



Charge

- In this analogy, the cars on the road are the charge in the circuit.
- The movement of the cars is similar to current, or charge moving through the circuit.

Resistors

- Resistance can be compared to the lanes on the road.
- A road with few lanes restricts the flow of traffic, and is comparable to a higher resistance.
- A road with many lanes allows traffic to flow freely, and is therefore similar to very low resistances.

Voltage Sources

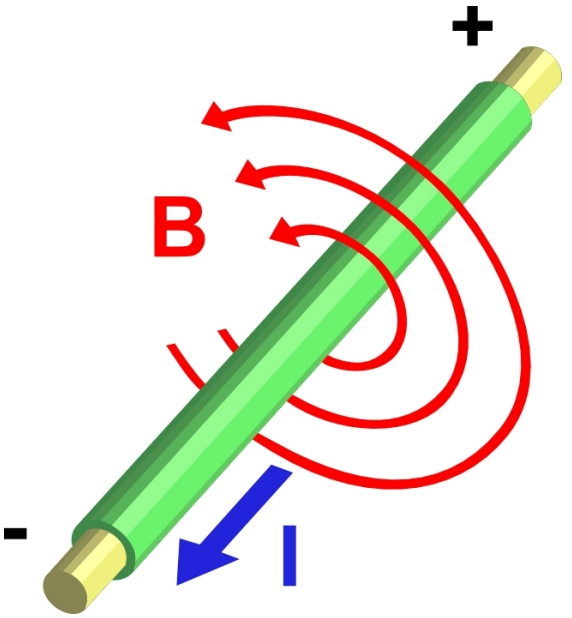
- Parking lots and highway off ramps are simliar to voltage sources when looking at the road network
- These things supply more cars that need to move throughout the network, similar to voltage sources adding charge into the circuit.

Why this helps

- This view of circuits and traffics helps to better understand how the circuit elements actually perform
- It also helps to see a simpler concept of traffic flow, which can be useful in designing road structures

Why this doesn't help

- This analogy falls apart when considering the human errors in the roadways, causing traffic where there is no real reason.
- It also falls apart when more advanced concepts such as magnetic fields are introduced.



Sources

- "Resistance and Ohm Law." Petervaldivia. N.p., n.d. Web. 14 Nov. 2016.
- "Electricity Analogy - FrugalPhysics." Electricity Analogy - FrugalPhysics. N.p., n.d. Web. 14 Nov. 2016.