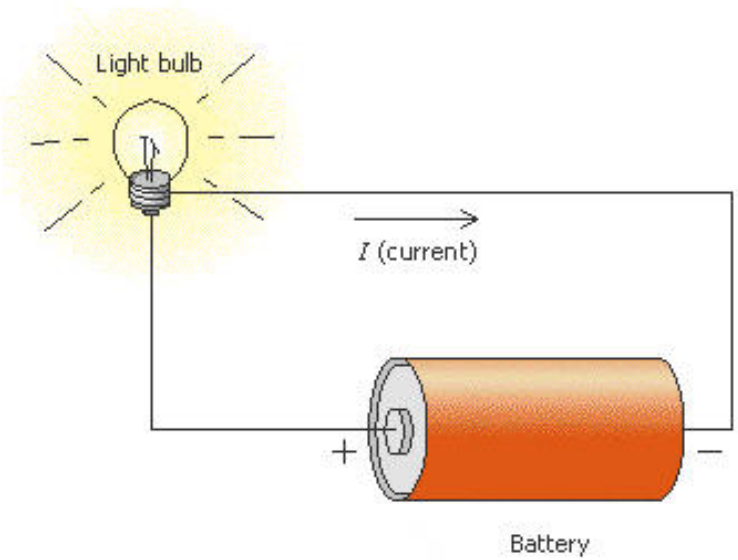
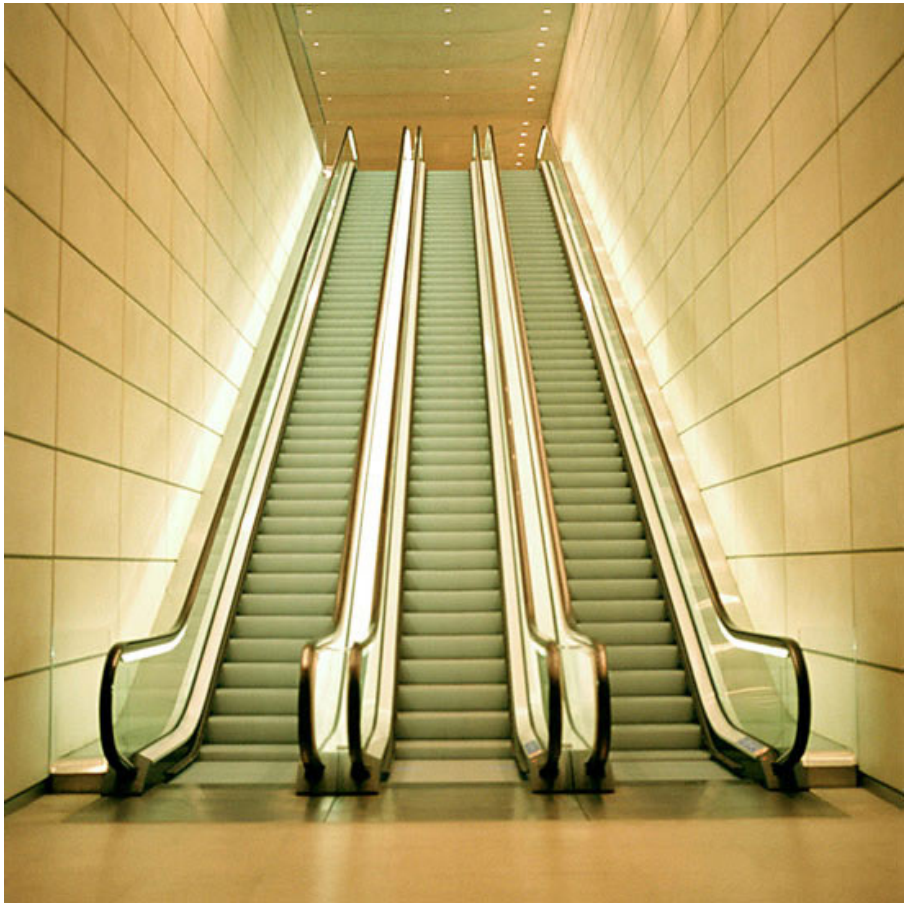


Electrical Circuits

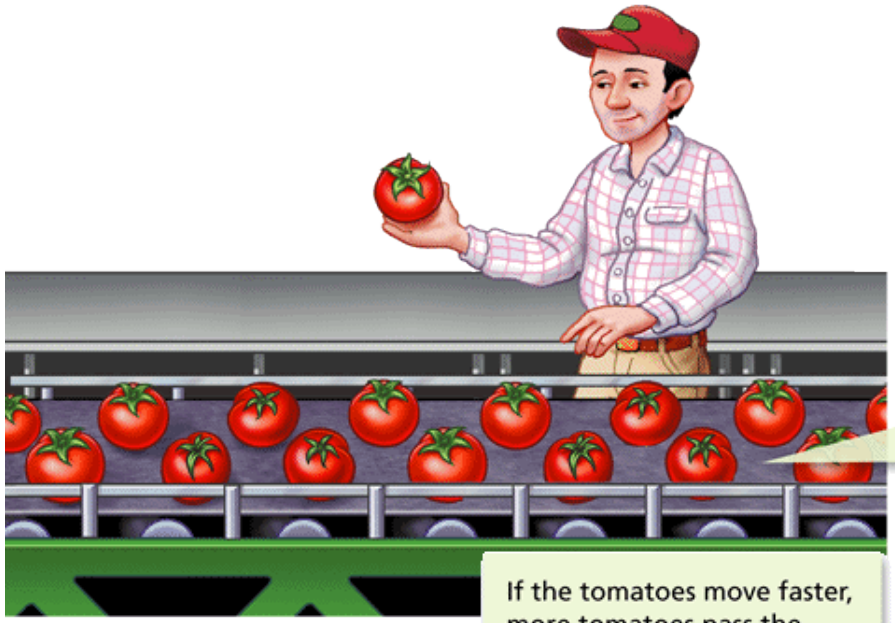
Let the electrons flow!

What is an electrical current?

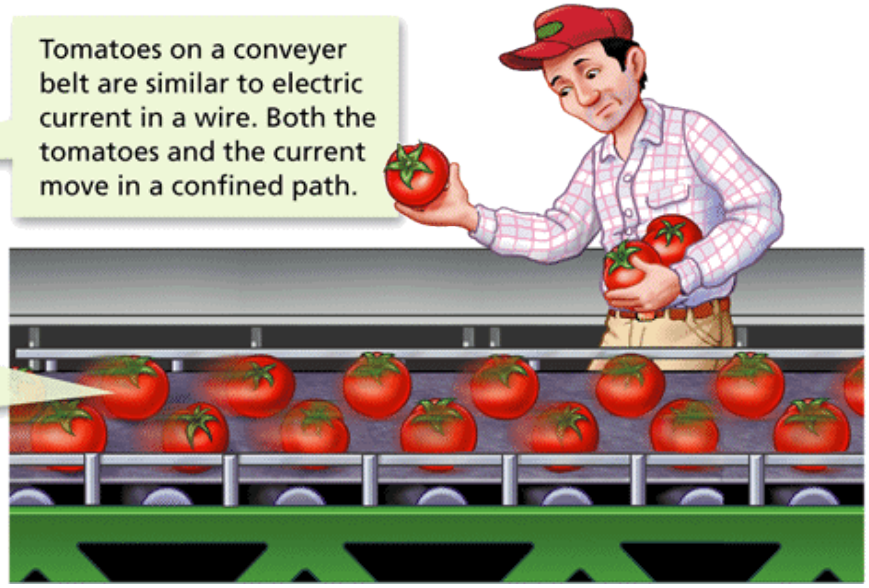


When you ride on an escalator you are in need of getting from one point to another, in a quick and easy way. The electric current in a wire operates on the same principal.

Current is measured as the **rate**, or amount, of charge that passes a specific point through a wire in a unit of time.

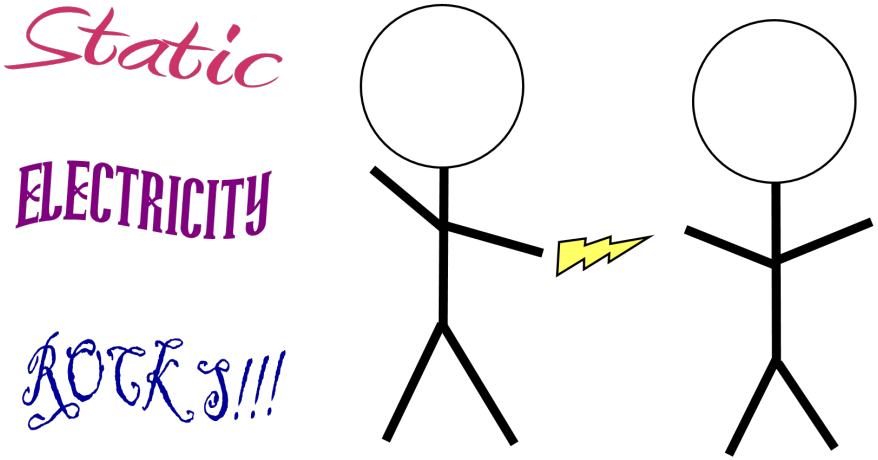


Tomatoes on a conveyer belt are similar to electric current in a wire. Both the tomatoes and the current move in a confined path.

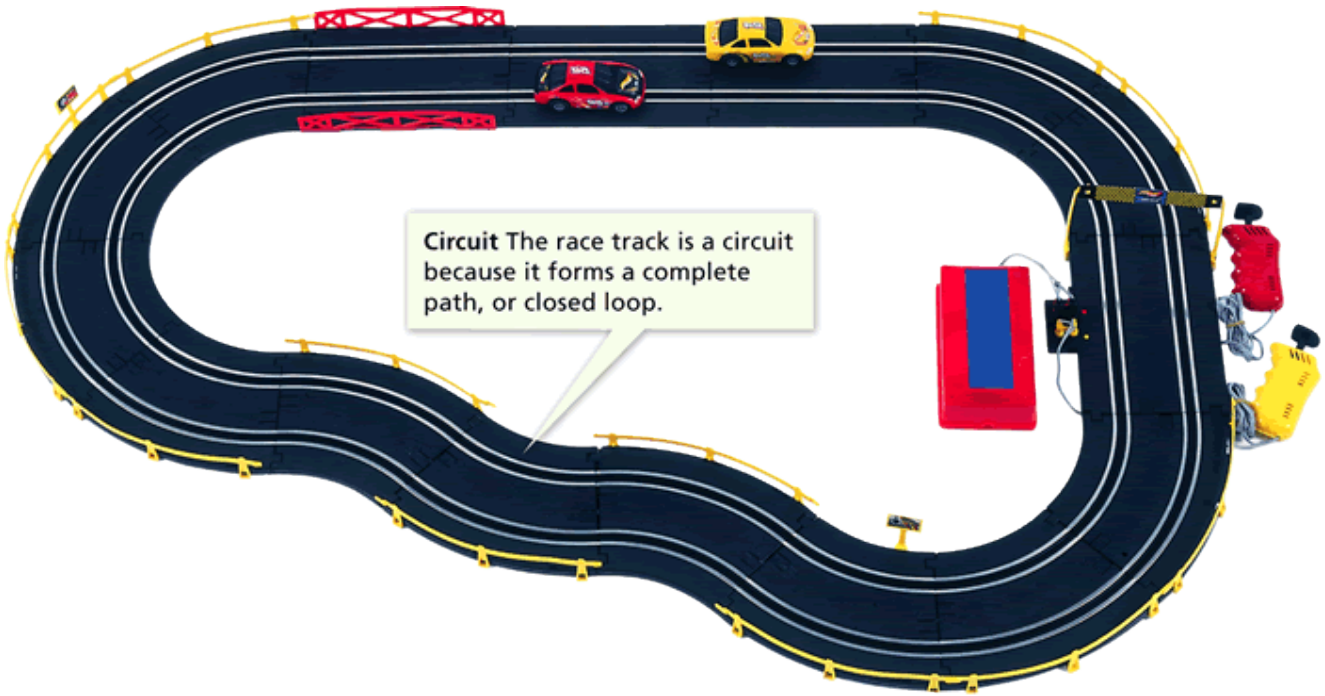


If the tomatoes move faster, more tomatoes pass the worker every second. Similarly, if current is increased in a wire, more charges pass by a point on the wire every second.

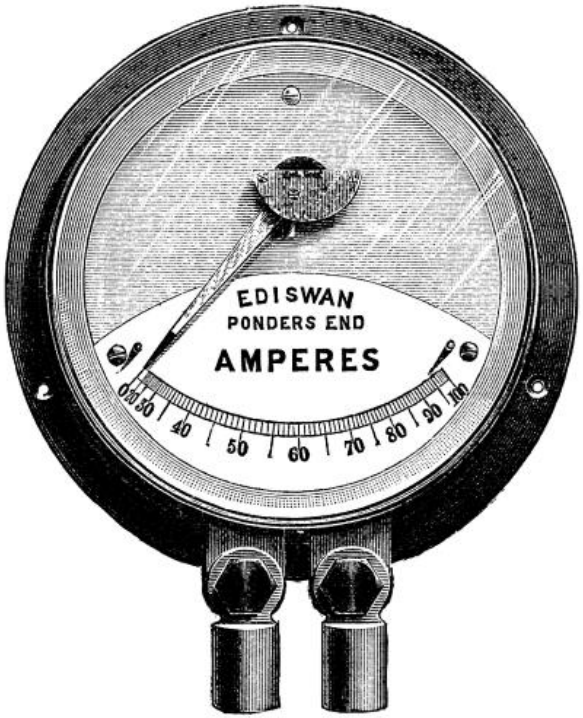
In a previous lab, you learned that the build up of electric charges on an object is called **static electricity**. Static electricity does not flow in a continuous path and that's how it differs from electric current.



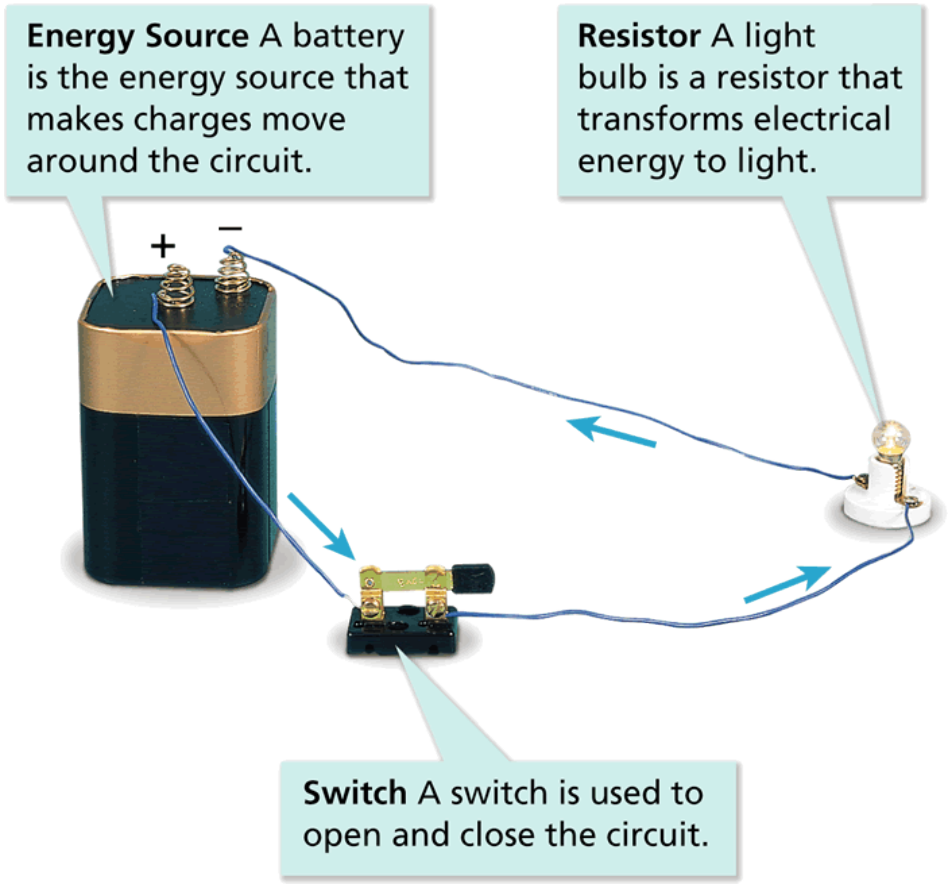
An **electric circuit** is a complete, unbroken, path through which electric charges can flow.

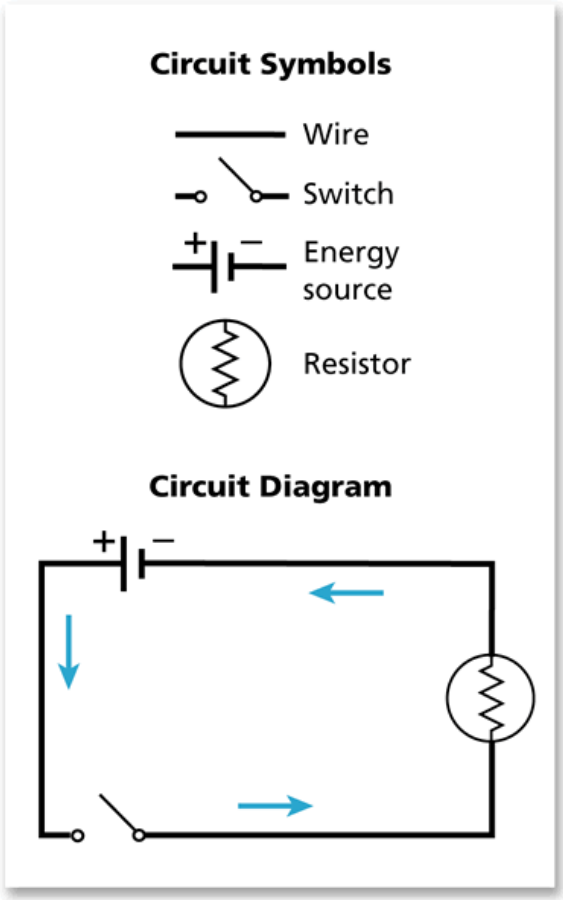


The unit of measure is called the **ampere**, or ***amp***, and is symbolized as ***A***. Therefore, the number of amps is the amount of charge flowing passed a given point per second.



Parts of a circuit





Resistance is the measure, in **Ohms**, of how difficult it is for a charge to flow through a material. The greater the resistance the less current.

Resistance: . There are four factors which determine a material's resistance:

1. **What the material is made from**. Insulators have high resistance while conductors have low resistance.
2. **The length of the material**. Long wires have more resistance than short wires. (Example- water flowing out of a long pipe versus a short pipe)
3. **Diameter (gauge) of the material**. Thin wires have more resistance than thick wires. (Example-small diameter pipe has less water flowing out of it than large diameter pipe)
4. **Temperature of the material**. Resistance increases as temperature increases.

Think about this!