

# The Basics of Electricity

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# Conductors

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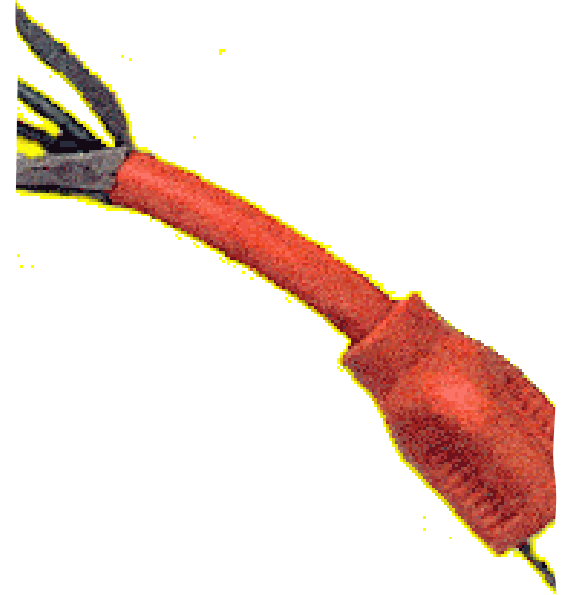
- Something that allows electricity to flow
- Examples;
  - metals
  - Water
  - air



# Insulators

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- Something that does NOT let electricity flow
- Examples
  - Glass
  - Plastic
  - Rubber
  - Porcelain





# Load

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- Something that uses electricity



# Load

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When you can't see it, use a tester!!

- Something that uses electricity



Motion



Sound



Heat



Light

# Power Source

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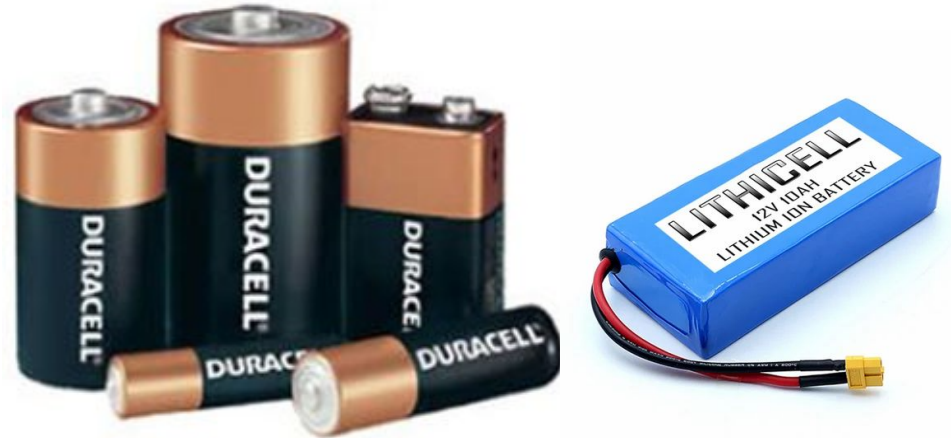


- Something that supplies electricity
- Examples;
  - Battery
  - Generator
  - solar panel



# Batteries

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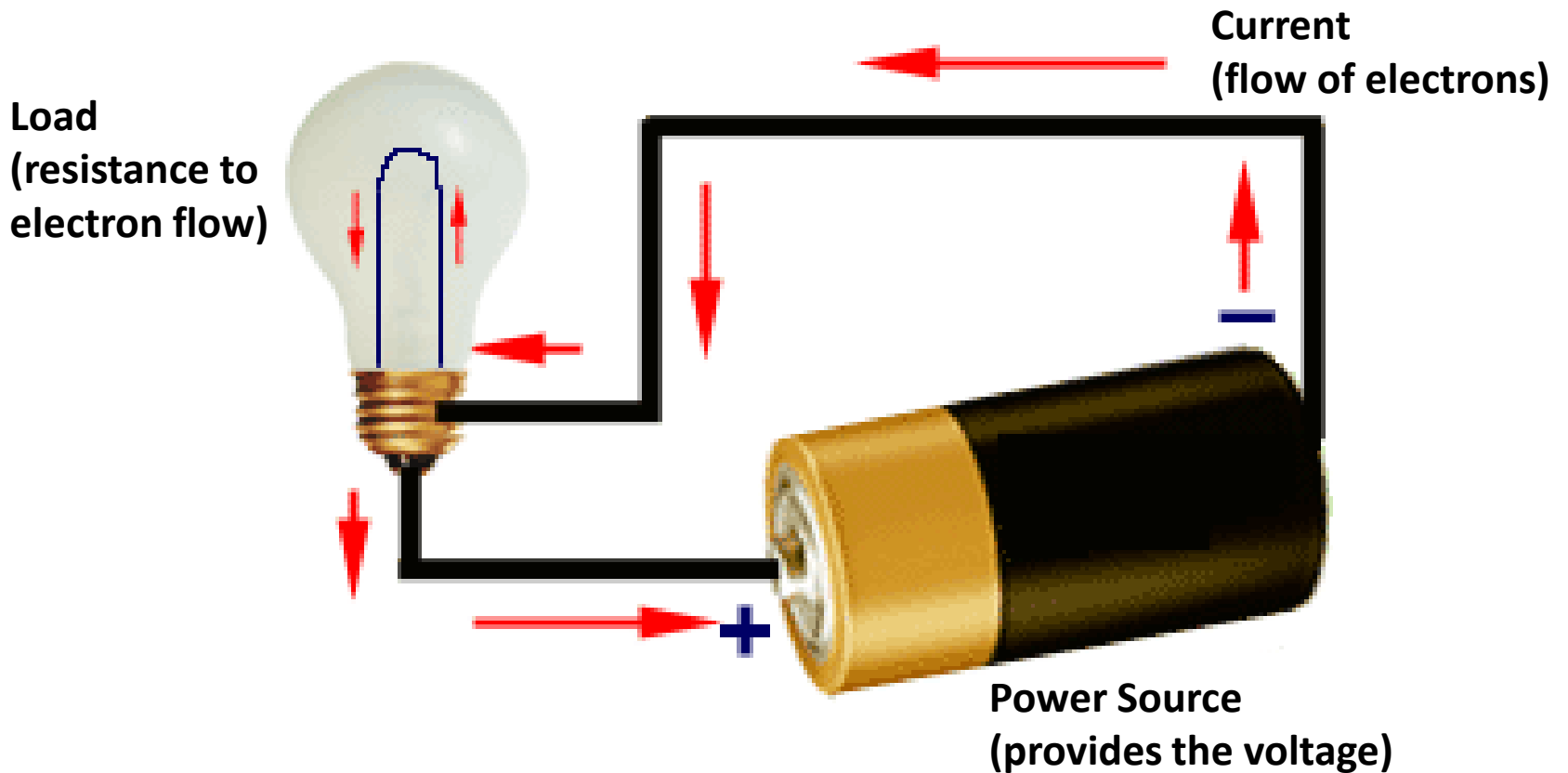


- Portable power source that has a positive and negative.
- The negative has extra electrons that want to move to the positive side.
- What voltage are AA, AAA, C, D batteries?

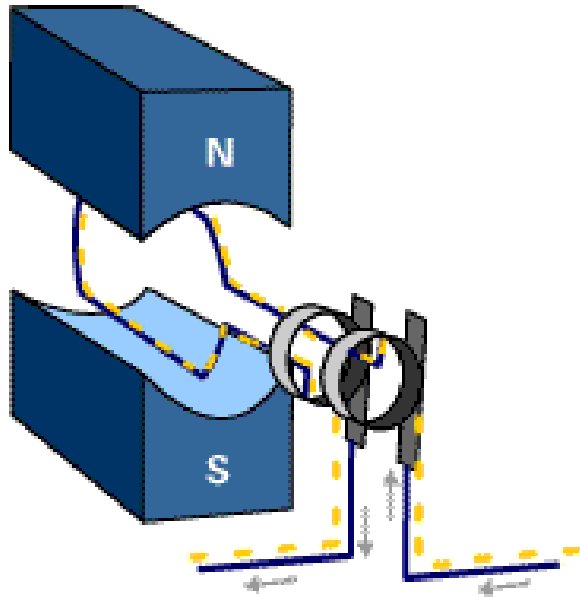


# Direct Circuit (DC)

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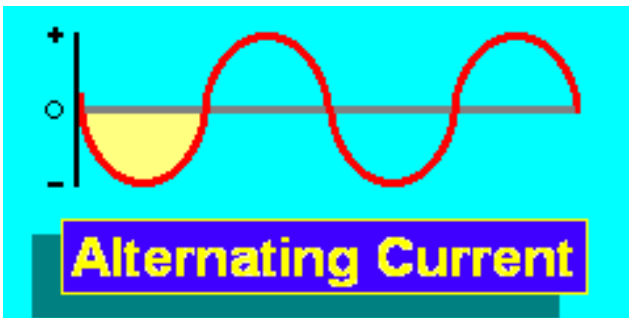


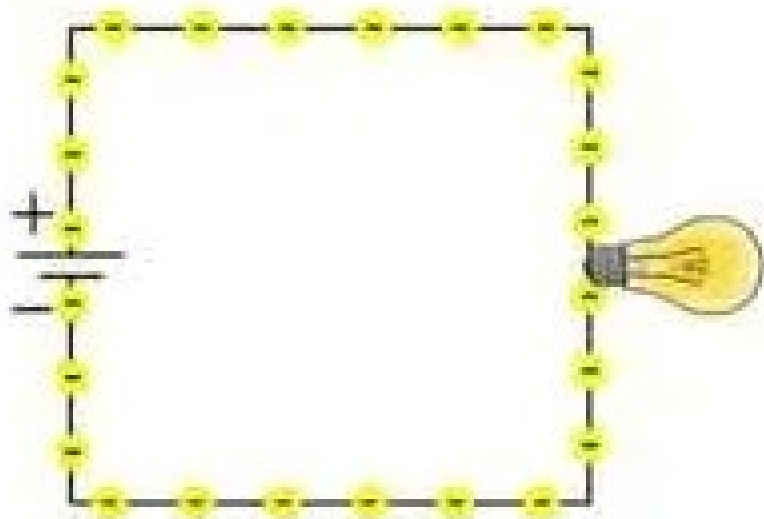


# Alternating Current

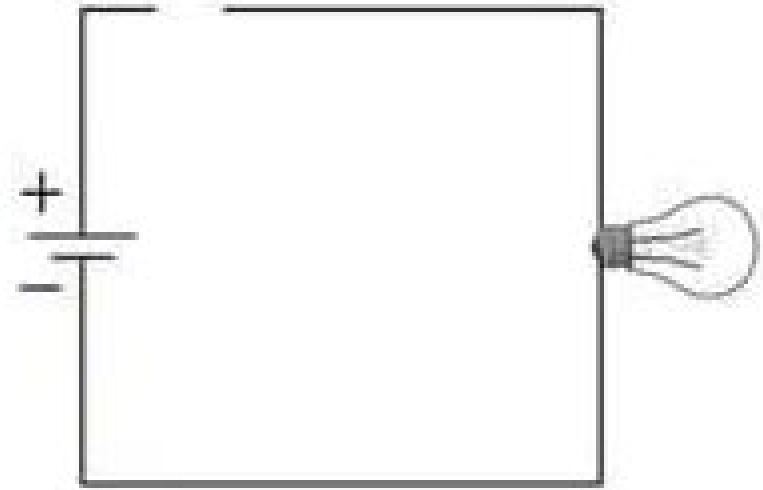
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- Alternating Current is a readily available power source around the world being created by hydro systems, wind turbines, coal fired generation plants and Nuclear Reactors.
- In BC, the hydro electric system (Dams) provides most of our power.
- The AC produced by the generators in our hydro electric system is approx. 120VAC @ 60Hz.
- This voltage is TOO HIGH and is AC not DC, therefore it will not work for electronic system.





closed circuit



open circuit

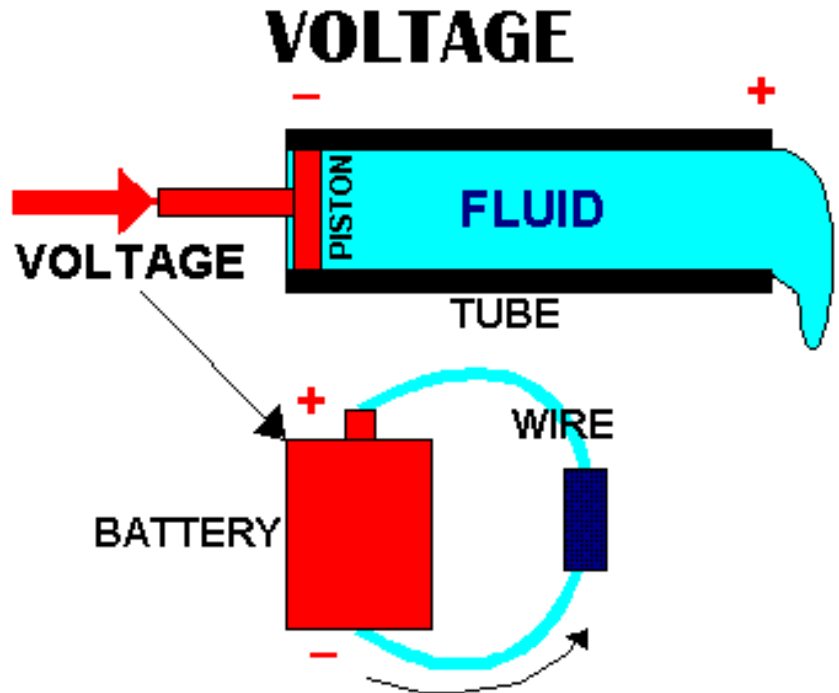
# Circuits



# Voltage

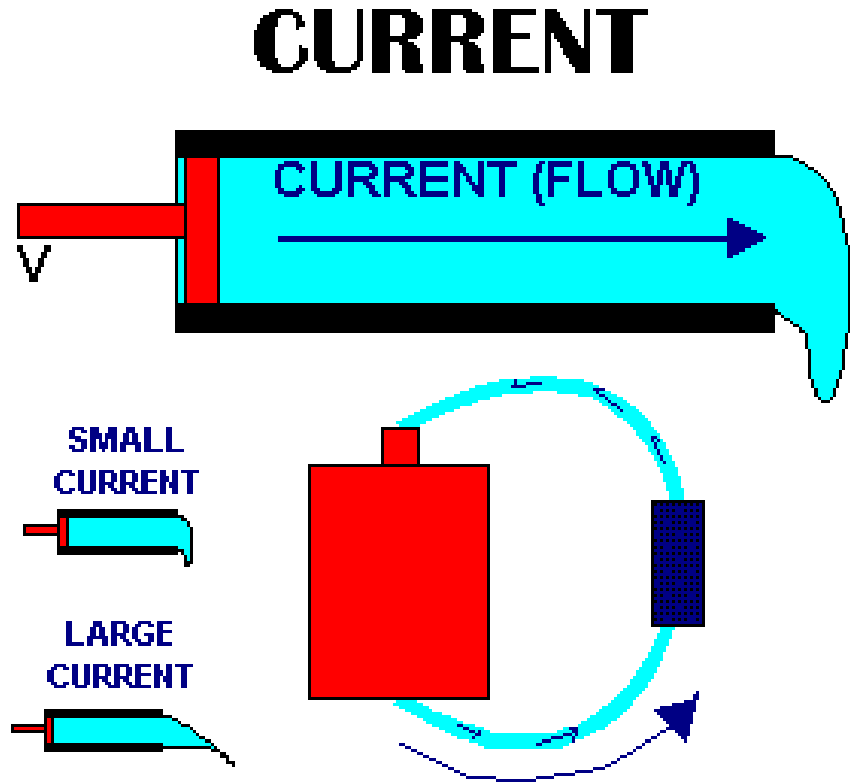
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- The force or pressure needed to move electrons in a circuit. The unit of measure is the volt
- Expressed as “V or E”



# Current

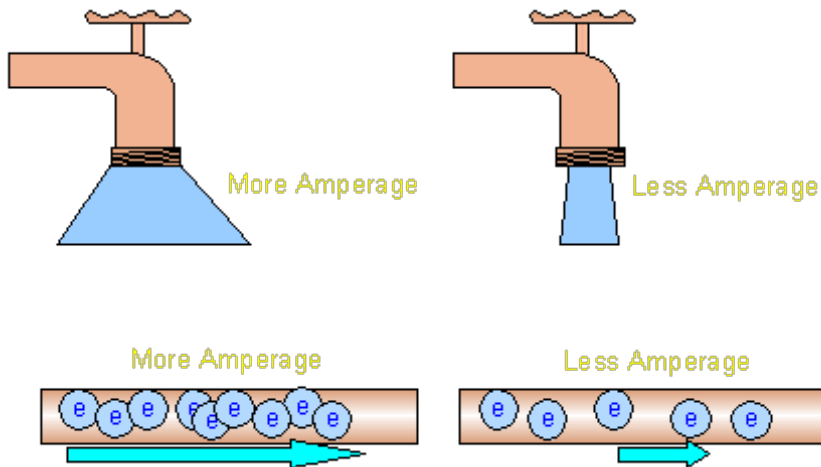
- The name given to the flow of electrons in a circuit. The unit of measure is the Ampere.
- In electronic circuits, electrons flow from negative to positive.
- Expressed as “I”





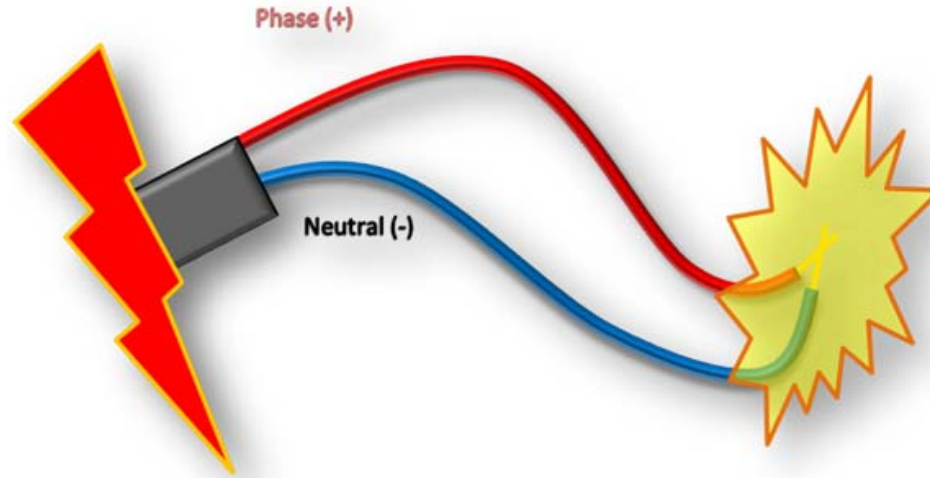
# Resistance

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Restriction of the flow of electrons (current) in a circuit. The unit of measure is the Ohm. The **less** resistance (open up faucet), the **greater** the current flow, the **more** resistance (close the faucet), the **less** the current flow

# SHORT CIRCUIT



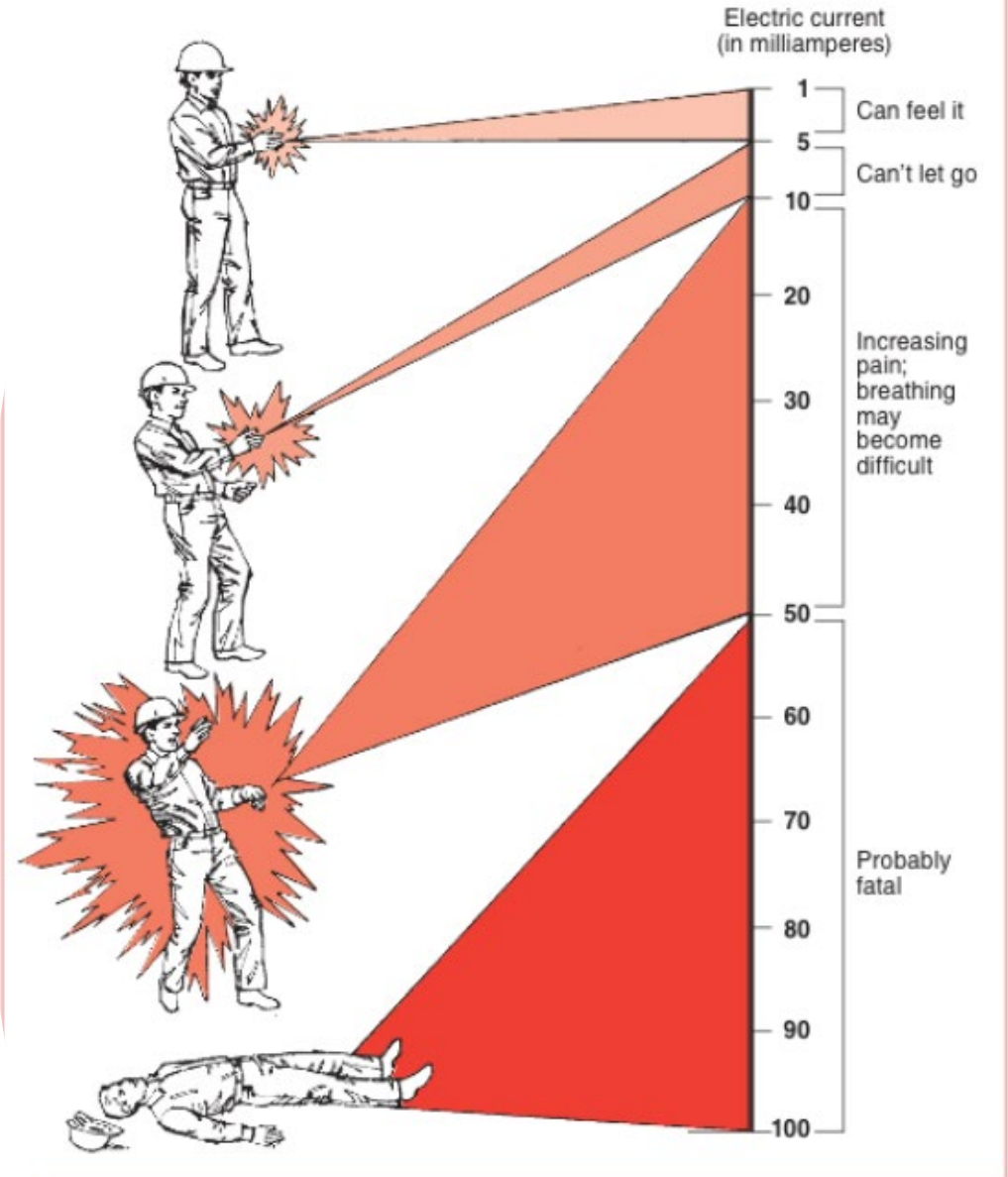
## Short Circuit

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a path of low resistance allowing a high current to flow

# Electricity can Kill

- The body has a natural resistance that is highest at the skin
- The dryer the skin, the higher resistance
- You NEED to respect it!



A 100-watt light bulb uses 1000 mA (milliamperes) of current. It takes only 5 mA to trip a ground fault circuit interrupter (GFCI). A small amount of current running through the body for a few seconds can give the effects shown in the table.

# Electrical Components and Their Characteristics

## Disclaimer

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- All electrical/electronic components require voltage and current to make them work. When working with electrical/electronic components it is **VERY IMPORTANT** to understand that these components will only work properly when the correct voltage and current are supplied to them.
- All electrical/electronic components are **RATED** for a specific range of voltage and current. Exceeding these ratings results in decreased life expectancy or failure of the component.





The END

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