TERMINOLOGY

Electrons are the basic unit of electricity.

Electrons are very fast.

Electrons do NOT like to be slowed down, so they seek the path of LEAST resistance.

Electrons flow down hill.

Conductors

Materials that allow electrons to flow easily are referred to as conductors.

Insulators

Materials that limit or prevent electron flow are referred to as insulators.

Electrical Circuits

Are closed loops OR circles of CONDUCTORS

Electrons (unit of electricity) FLOW through circuits according to some basic rules.

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known collectively as:

OHM'S* Law

*OHM was a guy who lived in the 1800s

OHM'S Law describes the relationship between three electrical properties.

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Voltage

Current

Resistance

Find a nice intro here.

X

OHM'S Law says:

$$V = I \times R$$

Read as :: V equals I times R

or :: Volts equals Current times Resistance

Voltage

The difference in electrical potential (energy) between two points in a circuit.

Measured in Volts (v)

THINK: Amount of **force** of **electrons**.

Current

A measure of the **quantity of flow** of electrons

- Unit is Amps or Amperes (A)
- Often measured in milliAmps (mA) or thousandths of amps

THINK: current (flow) of a river.

Resistance

- Measured in Ohms (Ω)

A measure of the restriction (opposition) to the flow of electrons in a circuit. (Note :: all conductors have a resistance, weird - its just small).

THINK: Tap or damn blocking flow of a river.

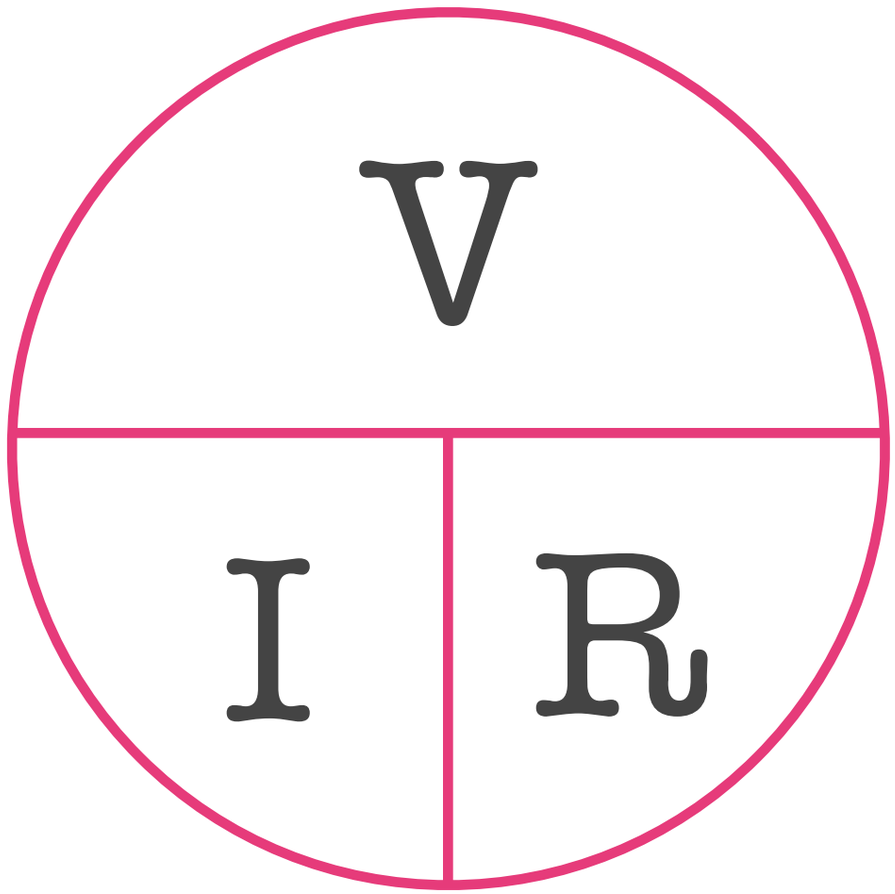
Electrical Components have VOLTAGE and CURRENT limits.

If we fail to respect these limits we can **hurt** our components.

This can involve smoke and heat.

X

OHM'S Law



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Just like an

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ESCHER

ESCHER's

Waterfall (1961) is an excellent way to visualize what happens inside a circuit.

Image is cropped — source.

Continuous loop.

V = height of fall
I = amount of water
R = barriers on path

It also captures the impossibility of what we are doing.

Image is cropped — source.