Source: [[KBhPHYS201IntroToElectrostaticsLN]]

1 | Resistance and Current

Resistance roughly measures how much pressure against current — electron flow there is in a conductor.

Current

Use the variable I, a unit $\frac{C}{s}$, $Amps$, to measure current. This also equals $\frac{\Delta V}{Resistance}$. Big resistance, little current. Current is measured in a unit $\frac{C}{s}$, which intuitively makes sense — Current/second is kind of like metres/second — it measures, roughly, the "speed" at which electrons flow.

> Definition 1 · **Current** I A value measured in unit $\frac{C}{s}$, a.k.a. $Amps$ that measures electron flow

Resistance

So, let's figure out resistance.

<<<<<<< HEAD We know that... $V = \frac{J}{C}$, per [[KBhPHYS201Voltage]], and we also know that resistance would equal a unit $\frac{Vs}{c}$ given that $I = \frac{C}{s} = \frac{\Delta V}{Resistance}$. Plugging in the definition of voltage, we get that resistance is measured in $\frac{Js}{C^2}$. We call this unit Ohms, or Ω.

> Definition 2 · **Resistance** Ω A value measured in $\frac{Js}{C^2}$ that measures the resistance to current

Calculating resistance

- So, let's think. With a wire of length L and with a wire of area A, if we increase L, the resistance in the wire would increase; if we increase area A, the resistance in the the wire would decrease.
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2 | $Resistance = \frac{L}{A} * ResistivityOfMaterial$ with units $\frac{m}{m^2}(\Omega \times m)$.

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  - Resistance = Ω = $\frac{\Delta V}{I}$ = $\frac{Js}{C^2}$

- I = $\frac{C}{s}$ = Amps
- Calculating resistance
  - So, let's think. With a wire of length L and with a wire of area A, if we increase L, the resistance in the wire would increase; if we increase area A, the resistance in the the wire would decrease.
  - $Resistance = \frac{L}{A} * ResistivityOfMaterial$ with units $\frac{m}{m^2} * (\Omega * m)$. >>>>>>> 61814fe663e7897cbc45406e965ad7a2

and, indeed, resistivity of materials are measured in $\Omega \times m$, which also makes sense intuitively.