What is engineering?

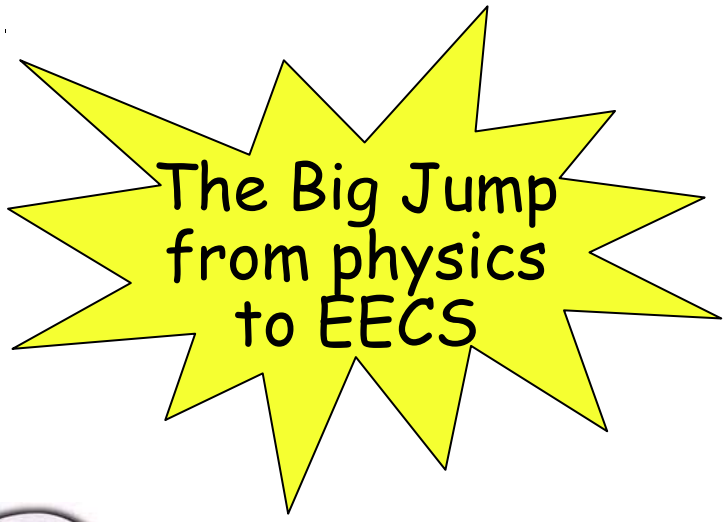
Purposeful use of science

What is 6.002 about?

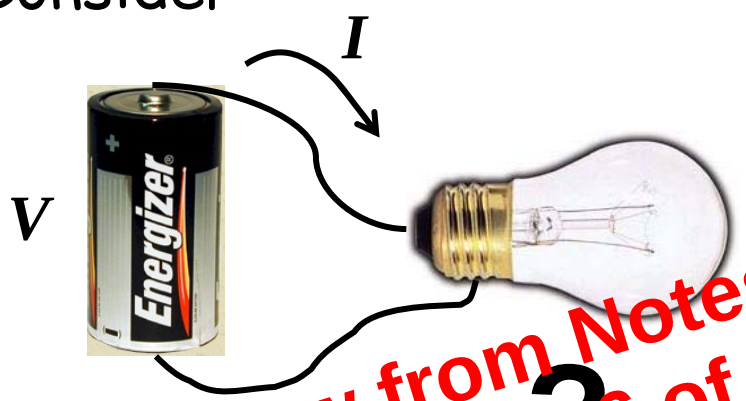
Gainful employment of Maxwell's equations

From electrons to digital gates and op-amps

Lumped Circuit Abstraction



Consider



Suppose we wish to answer this question:

What is the current through the bulb?

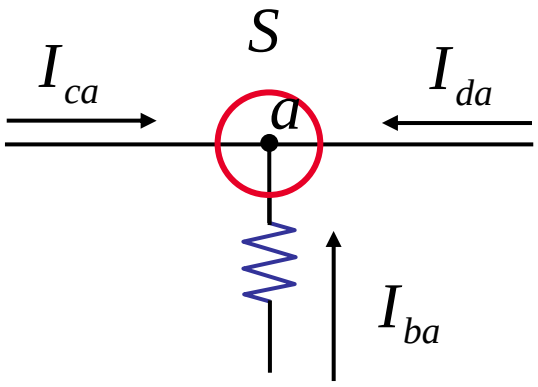
V Must also be defined.

So let's assume this too

V_{AB} defined when $\frac{\partial \phi_B}{\partial t} = 0$

So $V_{AB} = \int_{AB} \vec{E} \cdot d\vec{l}$ outside elements

What can we say about currents?



$$\oint_S J \cdot dS = -\frac{\partial q}{\partial t}$$

$$\Rightarrow I_{ca} + I_{da} + I_{ba} = 0$$

Kirchhoff's Current Law (KCL):

The sum of the currents into a node is 0.

simply conservation of charge