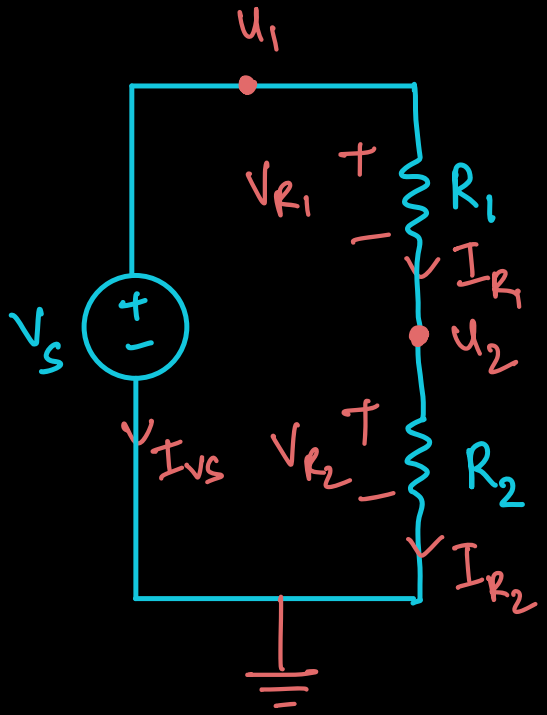
EECS 16A
Power and Voltage/Current Measurement

Previously on 16A……

NVA –

1. Identify nodes
2. Choose a ground
3. Label all elements (currents + voltages) & node potentials
4. KCL
5. Ohm's law
6. Current / Voltage sources
7. Set up $A\vec{x} = \vec{b}$ and solve

Previously on 16A..... {Voltage Divider}



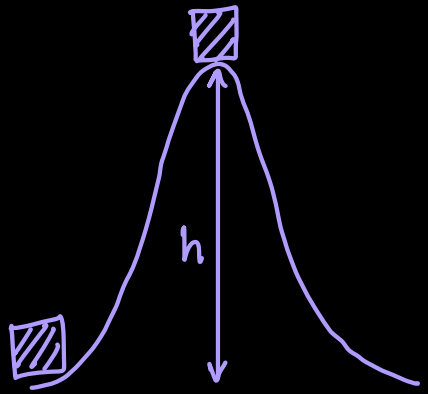
$$\longrightarrow u_2 = \frac{R_2}{R_1 + R_2} V_s$$

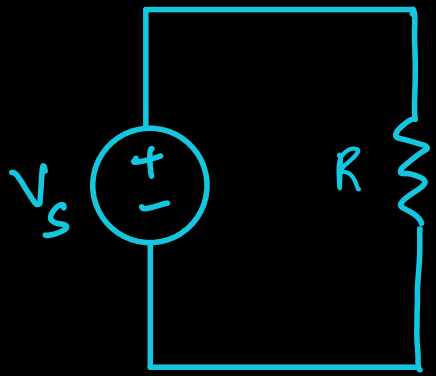
$$u_2 = \frac{1}{\frac{R_1}{R_2} + 1} V_s \quad \left\{ \frac{R_1}{R_2} = \alpha \right.$$

$$u_2 = \frac{1}{\alpha + 1} V_s$$

Energy and Power

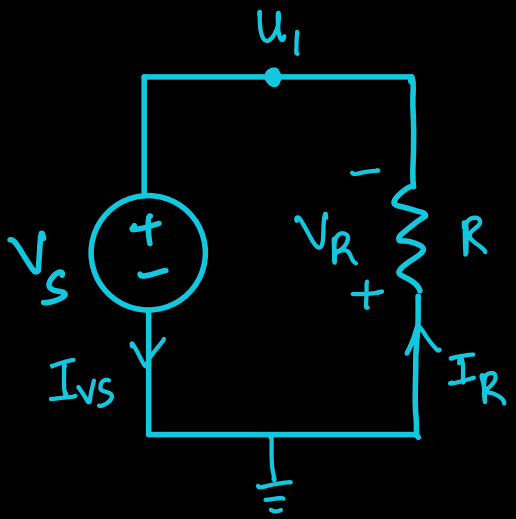
Current - Rate of flow of charge



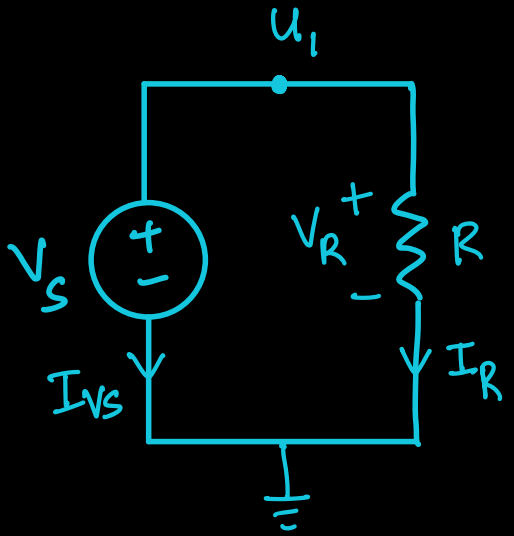


How to think about Energy and Power in circuits?

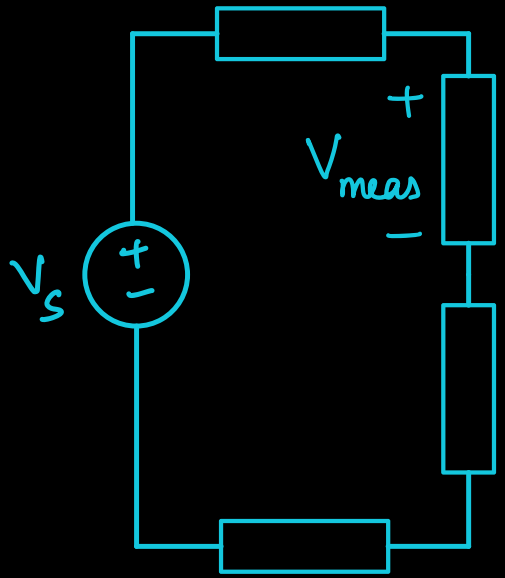
Power in Circuits Example



Power in Circuits Example

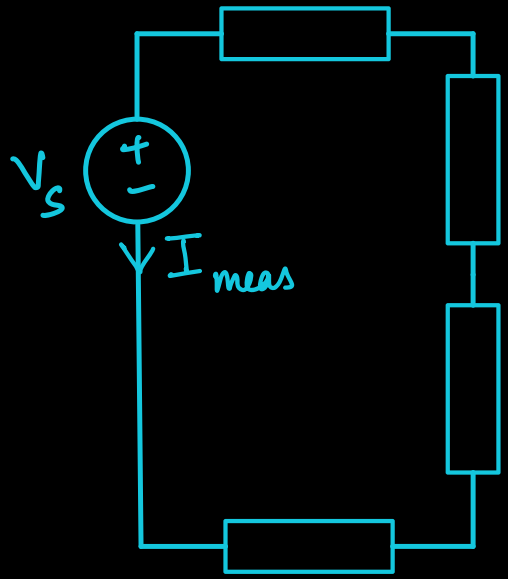


How to measure voltage? with a Voltmeter



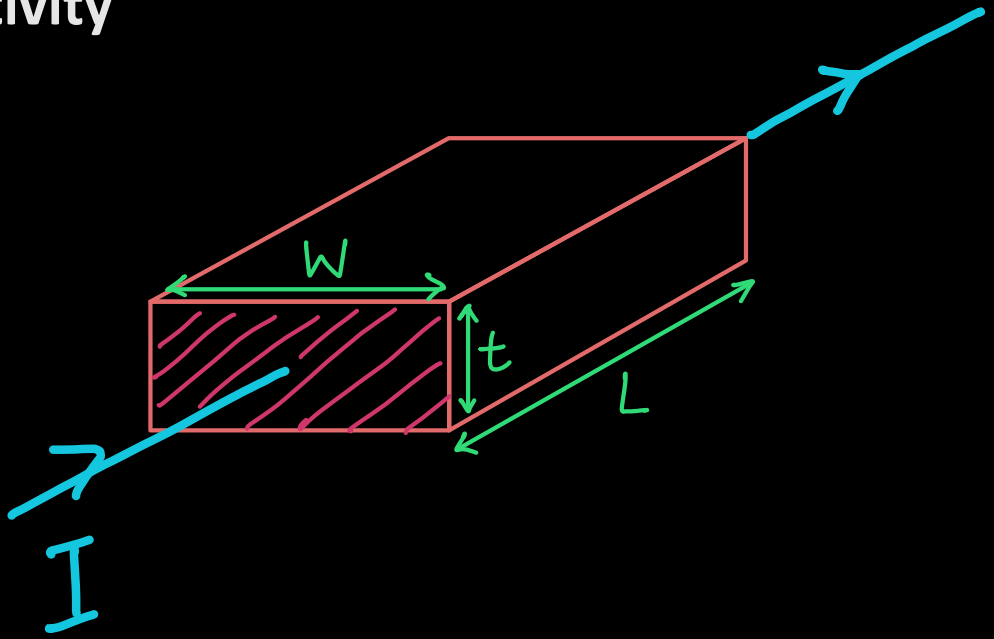
Ideal

How to measure current? with an Ammeter



Ideal

Resistivity



Analogy

Resistivity (Example)

$l = 5\,cm \quad A = 5\,cm^2$

$\rho_{Cu} = 1.72 \times 10^{-8}\,\Omega m$

$\rho_{wood} = 10^{14}\,\Omega m$

Resistive Touchscreen Design

1D Resistive Touchscreen (Approach)

1D Resistive Touchscreen (Basic Model)