

<http://www.physics.nyu.edu/courses/V85.0020/node16.html>

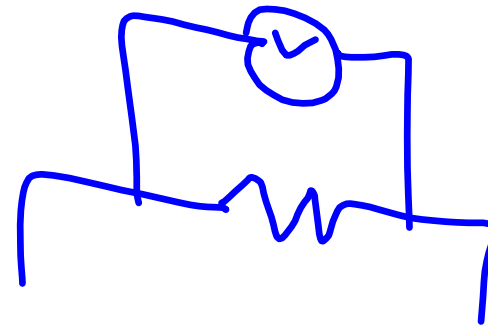
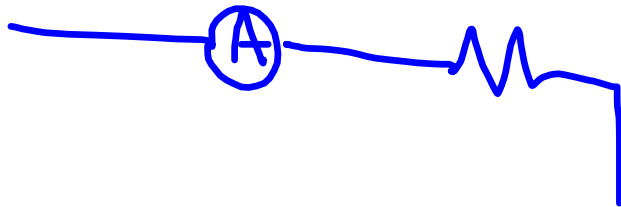
Electricity and Magnetism quick review and overview

What are Kirchoff's two rules?

Junction Rule:  $I_{in} = I_{out}$

Loop Rule:  $V - IR = 0$

So how do you attach an ammeter? a voltmeter?



## Can I do a discovery lab of these?

Need appropriate inductor and capacitor and resistor such that the time constant is noticeable.

$$\tau = RC$$

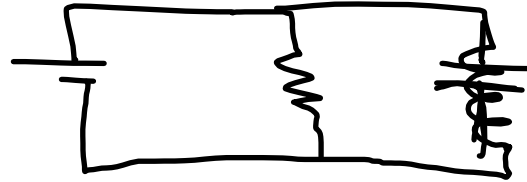
$$\tau = RL$$

What is an **RC** circuit?

an **RL** circuit?

(Draw diagrams)

Can I do a discovery lab of these?



$$Q = VC$$

What are the units on all of these physical quantities?

Voltage, emf, electric potential

$$V = J/C$$

Resistance

$$\Omega = V/A$$

Current

$$A = C/s$$

Inductance

$$\text{Henry} = \frac{kg \cdot m^2}{s^2 A^2} = \frac{J}{A^2}$$

Capacitance

$$F = C^2/J = C/V$$

Power

$$W = J/s$$

How does the current and voltage behave over time in these circuits?

Immediately after the switch is closed the capacitor acts like a short circuit; long time, open circuit. It is building up enough charge to flow easily across.

After a long time an inductor is like a short circuit; short time, open circuit because of back emf.

