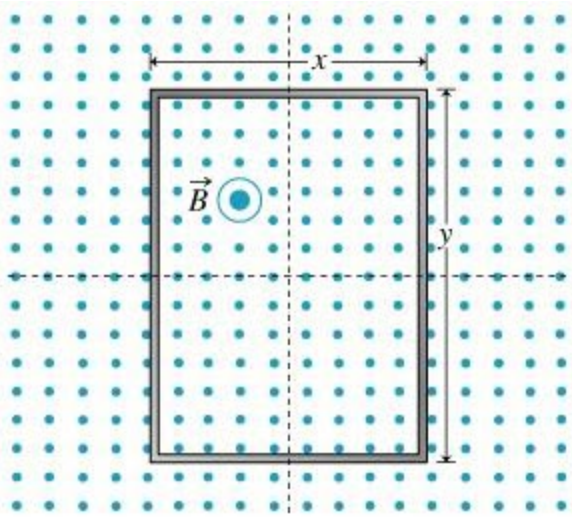
Physics 12 Section 21-2
Faraday's Law of Induction; Lenz's Law

1. Faraday determined that the amount of EMF induced in a loop depended on



2. The product of the

3. The amount of induced EMF can be found using Faraday's law of induction.

Faraday's Law of Induction

$$\mathcal{E} = -N\frac{\Delta\Phi_B}{\Delta t}$$

4. Lenz's Law states that:

Example p626: A square coil of sides 5.0cm contains 100 loops and is positioned perpendicular to a uniform 0.60T magnetic field. It is quickly pulled from the field to a region where B drops abruptly to zero. It takes 0.10s for the whole coil to reach the field free region. Find the change in magnetic flux, the EMF and current induced, how much energy is dissipated in the coil if its resistance is 100Ω, and what was the average force required?

$$\Delta\Phi = \Phi_2 - \Phi_1$$

$$\mathcal{E} = \frac{-N\,\Delta\Phi}{\Delta t}$$

$$I = \frac{\mathcal{E}}{R}$$

$$I = .015A$$

$$E = Pxt$$

$$E = 2.3 \times 10^{-3}\ J$$

$$W = F \times d$$

$$F = \frac{W}{d}$$