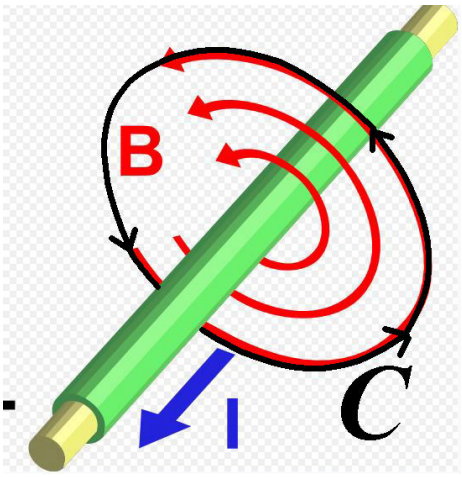
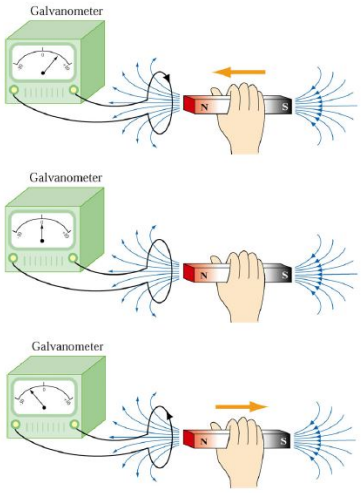
Ampere's Law

$$\oint_C \vec{\mathbf{B}} \bullet d\vec{\mathbf{r}} = \mu_0 I$$

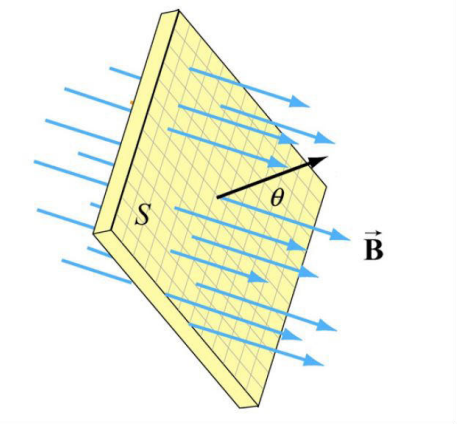


Electromagnetic Induction



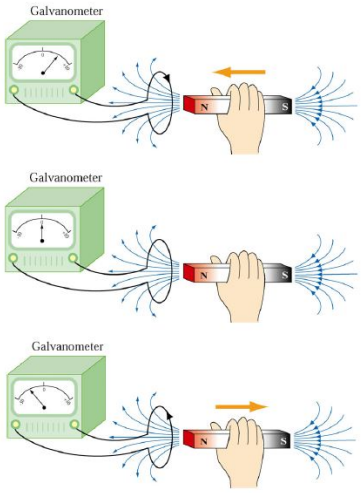
Magnetic Flux through surface S

$$\Phi_S = \int\int_S \vec{\mathbf{B}} \bullet \vec{\mathbf{n}}\, dS$$



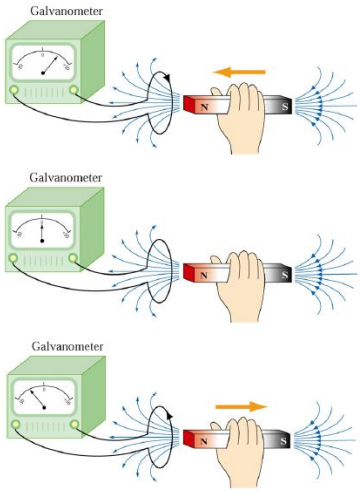
Faraday's Law

$$-\frac{d\Phi}{dt} = \oint_C \vec{\mathbf{E}} \bullet d\vec{\mathbf{r}}$$



Faraday's Law

$$-\frac{d}{dt}\iint_S \vec{\mathbf{B}} \bullet \vec{\mathbf{n}}\, dS = \oint_C \vec{\mathbf{E}} \bullet d\vec{\mathbf{r}}$$



Faraday's Law

$$-\iint_S \frac{\partial \vec{\mathbf{B}}}{\partial t} \bullet \vec{\mathbf{n}}\, dS = \oint_C \vec{\mathbf{E}} \bullet d\vec{\mathbf{r}}$$