Magnetic (B)-Fields

- Always form closed loops
- Can't isolate the poles
- $\vec{\mathrm{B}}$-fields are only created by moving charges
- Only moving charges interact with a $\vec{\mathrm{B}}$ field
- Creation of $\vec{\mathrm{B}}$ or interaction with B, have to deal with all 3-dimensions

B-Fields

Direction: RHR, if q is (-) flip 180°

$\vec{\mathrm{B}}$ units: 1 N/Am = 1 tesla = 1 T

1 gauss = 1 G = 10^{-4} T

Magnetic Force

- Centripetal
- $\vec{F}_m \perp \vec{v}$
- $\vec{F}_m \perp \vec{\mathrm{B}}$

Lorenz Force

$\vec{F}_m = q\left(\vec{v} \times \vec{B}\right)$

Velocity Selector

if $|F_{\text{electric}}| = |F_{\text{magnetic}}|$:

$v = \dfrac{E}{\mathrm{B}}$

Magnetic Flux

$\Phi_{\mathrm{B}} = \int \vec{\mathrm{B}} \cdot d\vec{A}$