

Magnetic (B)-Fields

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

B-Fields

Direction: RHR, if q is (-) flip 180°

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

$1 \text{ gauss} = 1 \text{ G} = 10^{-4} \text{ T}$

Magnetic Force

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

Lorenz Force

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

Velocity Selector

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

$$v = \frac{E}{B}$$

Magnetic Flux

$$\Phi_B = \int \vec{B} \cdot d\vec{A}$$