

D) Direction of the force on a **wire** carrying current in a **magnetic field**

3rd Left Hand Rule - Wire in a magnetic field

- 1) Draw magnetic Flux lines (_____)
- 2) **Left Thumb** - Point in direction of **current**
- 3) Place **four fingers** in the direction of the **magnetic field**
- 4) **Palm** shows direction of the **force** on the conductor

Top View - Wire in a magnetic Field - Figure 1

In which direction will the force on this wire be directed? **Up or Down?**

Figure 2

Figure 2 - In which direction will the force on this wire be directed? **Up or Down?**

Figure 3

Figure 3 - In which direction will the force on this wire be directed? **Up or Down?**

The force on conductor is **maximum** when conductor is placed

_____ to field and **zero** when it moves

_____ to field.

E) Forces between current carrying wires

Opposite Currents Wires _____

Same Current Direction/**Wires attract**

When wires are _____, **no forces** exist between the wires

F) Magnetic Force on moving charges

When a _____ is shot through a _____ it experiences a force.

If you wanted to **maximize** the **force** on the **charge**:

a) How would you shoot a charge through a magnetic field?

Fast or Slow??

b) What kind of charge would you use? **Big or Small??**

c) What kind of magnetic field would you use? **Big or Small??**

1. $F_{\text{magnetic}} = Bq v$ **B** - flux density of magnetic field (strength)

q - charge (C)

v - velocity (m/s)

The magnetic force is _____ when the charge

Moving _____ to field

The _____ is _____ when the charge moving

_____ to field

2. Finding the **direction** of the **magnetic force** on a **free charge** moving through a magnetic field

Use **3rd Left hand Rule**

- **thumb** - direction of moving _____
- **4 fingers** - direction of magnetic Field
- **palm** - direction of force on charge

Figure 1: When this charge reaches the magnetic field, where will it be pushed?

Answer: Into or Out of the page?

- **Draw in flux lines**
- **thumb** - direction of moving _____
- **4 fingers** - direction of magnetic Field
- **palm** - direction of force on charge