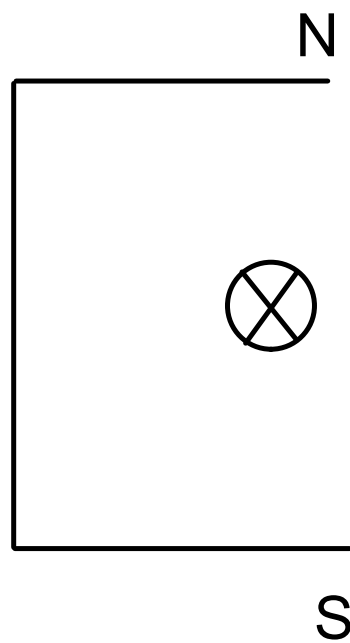
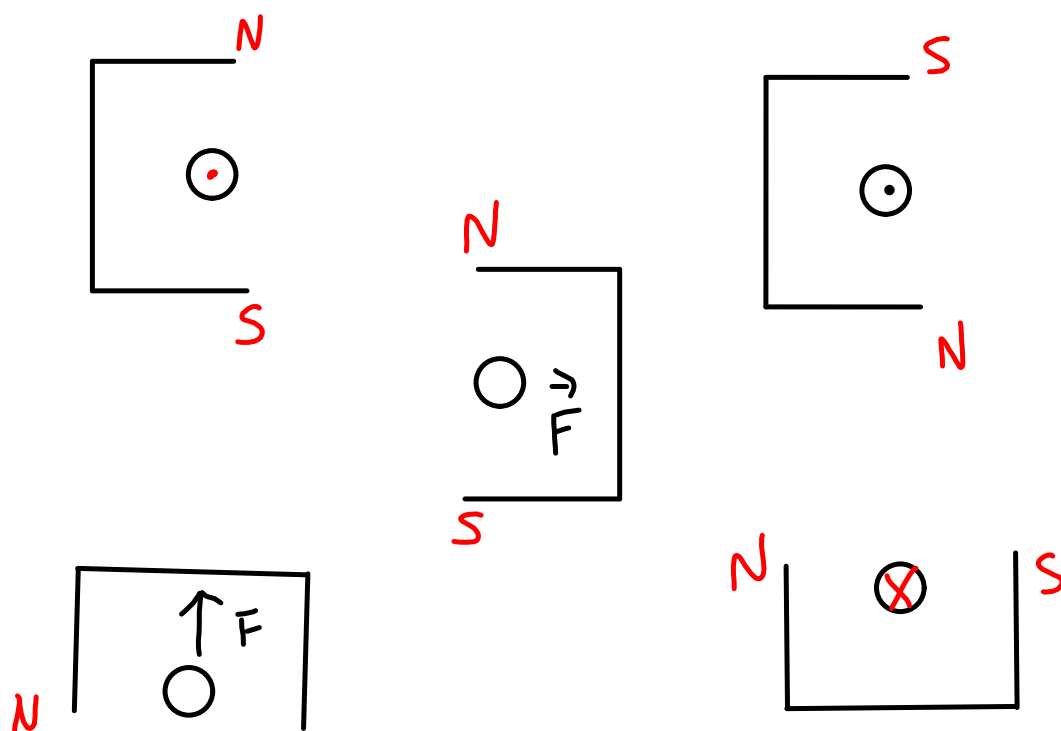


**Motor Principle - LHR#3 ->**



LHR 3 - The Motor Principle



**Motor Principle equations** are used to calculate the force on a straight conductor when it is in a permanent magnetic field.

The direction of the force is determined by using the left hand rule for the motor principle.

$$F = BIL \sin \theta$$

B - magnetic field (T)  
I - current (A)  
L - length of the conductor (m) in the magnetic field  
 $\theta$  - angle between the conductor and the magnetic field

*Assign #1-3 on last days worksheet...*

$$\begin{aligned} 1. \quad F &= BIL \sin \theta \\ F &= (3.2 \times 10^{-3})(2)(1.5) \sin 90 \\ F &= 9.6 \times 10^{-3} \text{ N} \end{aligned}$$

$$\begin{aligned} 2. \quad F &= BIL \sin \theta \\ 6.0 \times 10^{-6} &= (3.4 \times 10^{-6}) I (5.5) \sin 30^\circ \\ I &= 0.64 \text{ A} \end{aligned}$$

$$3. \quad F = \underline{B} I L \sin \theta$$

$$1.5 = B (2) (17) \sin 90^\circ$$

$$\frac{1.5}{2(17)} = B$$

$$4.4 \times 10^{-2} \text{ T} = B$$