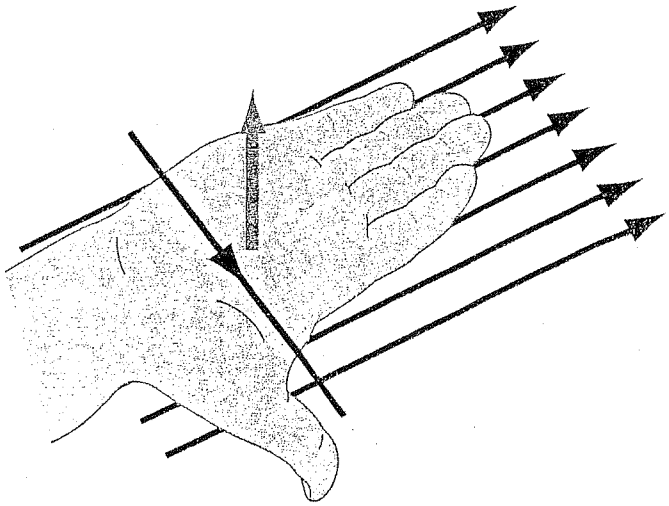
**The Right Hand Rule for the Motor Principle** – If the fingers of the right hand point in the direction of the magnetic field and the thumb points in the direction of the current, the force on the conductor will be in the direction in which the right palm would push.



Notice that the direction of the magnetic field and the direction of the current will always be at right angles to each other. When the magnetic field and the current flow are in the same direction, there is no force on the wire.

# RHR # 3 Homework

1. A wire in the armature of an electric motor is 25 cm long and remains in, and perpendicular to, a uniform magnetic field of 0.20 T. What force is exerted on the wire when it carries a current of 15 A? (0.75 N)

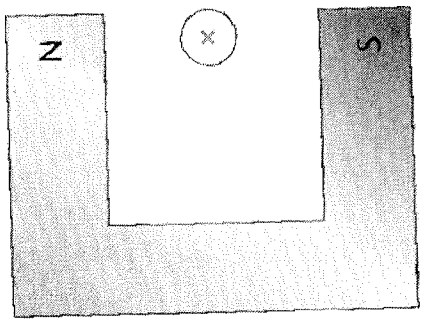
2. What length of conductor, running at right angles to a 0.033 T magnetic field and carrying a current of 20 A, experiences a force of 0.10 N? (0.15 m)

3. A wire connecting a taillight to a motorcycle battery is 1.0 m long, and is lying perpendicular tot he Earth's magnetic field. If it experiences a force of $6.0 \times 10^{-5}$ N when carrying a current of 1.5 A, what is the magnitude of the Earth's magnetic field at that location? ($4.0 \times 10^{-5}$ T)

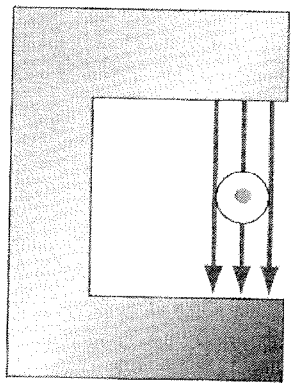
4. Two electrical line poles are situated 50 m apart, one directly north of the other, and the horizontal wire running between them carries a DC current of 200 A. If the Earth's magnetic field, in the vicinity, has a magnitude of $5.0 \times 10^{-5}$ T and the magnetic inclination is 45°, what is the magnetic force on the wire? (0.35 N)

**RHR #3 - Practice**

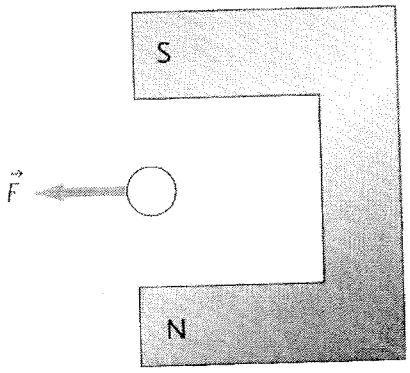
1. Show the direction of the magnetic field and the direction of the force on the wire.




2. Label the North and South poles of the magnet and indicate the direction of the force on the wire.



3. Show the direction of the magnetic field and the direction of the current flow in the wire.




4. Label the North and South poles of the magnet and indicate the direction of the current flow in the wire.