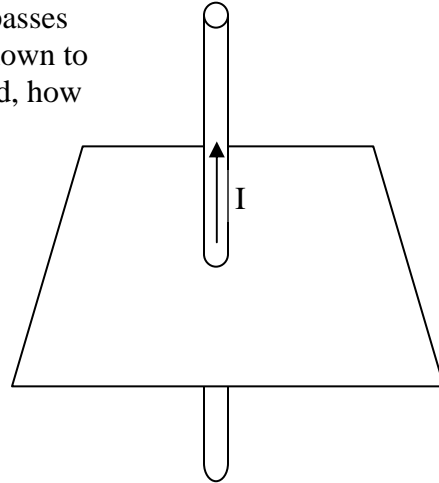
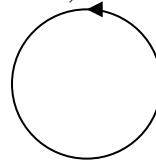


## Electromagnetism Worksheet

1. A wire connecting a taillight to a motorcycle battery is 1.0 m long, and is lying perpendicular to the Earth's magnetic field. If it experiences a force of  $6.0 \times 10^{-5}$  N directed into the ground when carrying a current of 1.5 A west, what is the magnitude and direction of the Earth's magnetic field at that location?
2. A wire carrying a large and constant electric current passes through the center of a perpendicular cardboard, as shown to the right. If iron filings are sprinkled on the cardboard, how will they arrange themselves?



3. If the current in a loop of wire is flowing counterclockwise, as shown, what is the direction of the magnetic field at the center of the loop?



4. A wire 100 cm long carrying a current of 10 A is at right angles to a uniform magnetic field. The force acting on the wire is 2 N. What is the magnitude of the magnetic field?
5. An underground cable 250 m long is aligned in an east-west direction. The magnetic field is  $4.0 \times 10^{-5}$  T directed north. The magnetic force on the cable is 0.20 N vertically down. What is the magnitude and direction of the current in the cable?
6. A wire carries a current from right to left in a magnetic field that is directed towards the top of the page. In what direction will the wire will be deflected?
7. Given the diagram of a solenoid to the right, determine the magnetic polarity at point "X".

