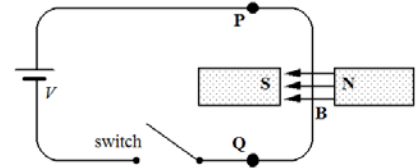
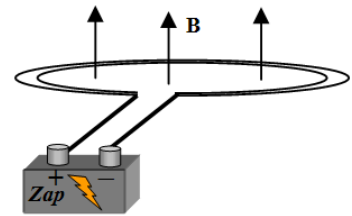


## Ch. 22 Worksheet

1. A portion of a loop of wire passes between the poles of a magnet as shown. We are viewing the circuit from above. When the switch is closed and a current passes through the circuit, what is the movement, if any, of the wire between the poles of the magnet?



2. A circular loop of wire is placed in a magnetic field such that the plane of the loop is perpendicular to the magnetic field. The loop is then connected to a battery and a current then flows through the loop. What will happen to the loop?



3. An ion source is producing  ${}^6\text{Li}$  ions, which have charge  $+e$  and mass  $9.99 \times 10^{-27}$  kg. The ions are accelerated by a potential difference of 10 kV and pass horizontally into a region in which there is a uniform vertical magnetic field of magnitude  $B = 1.2$  T. Calculate the strength of the smallest electric field, to be set up over the same region that will allow the  ${}^6\text{Li}$  ions to pass through undeflected.

4. An electron of kinetic energy 1.20 keV circles in a plane perpendicular to a uniform magnetic field. The orbit radius is 25.0 cm. Find the following:
- The electron's speed
  - The magnetic field magnitude
  - The circling frequency
  - The period of motion

5. The figure shows two long straight wires at separation  $d = 16.0$  cm carry currents  $i_1 = 3.61$  mA and  $i_2 = 3.00i_1$  out of the page.

- Where on the x-axis is the net magnetic field equal to zero?
- If the two currents are doubled, is the zero-field point shifted toward wire 1, shifted toward wire 2, or unchanged?

