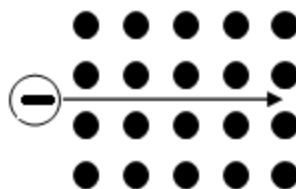
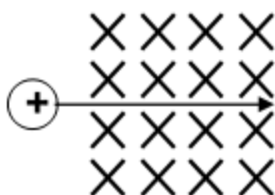
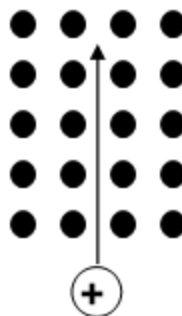
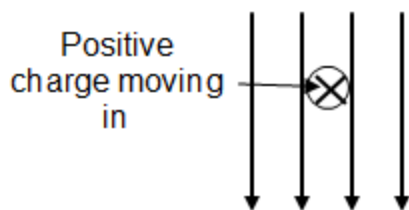


Magnetic Force Direction on a Moving Charge:

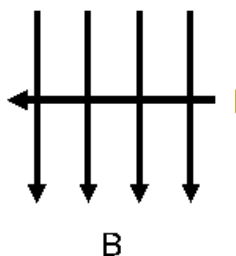
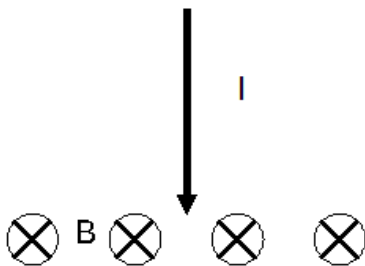
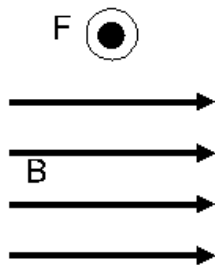
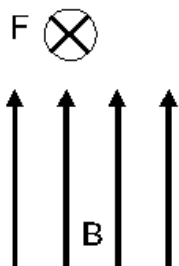
1. Determine the direction of the force on a moving charge in the diagrams below.



Magnetic Force on a Current Carrying Wire:

Force Direction on a Wire - Use RHR, positive charge moving + to - :

1. Use the right hand rule to find the direction of the current or the force in the diagrams below:



Magnetic Force on a Moving Charge:

$$F = Bqv$$

$B =$ Magnetic field strength in Teslas (T)

$q =$ Charge of the object in Coulombs (C)

$v =$ Velocity of the object (m/s)

Magnetic Force on a wire:

From our experience in the lab, we also know that a wire with a current in it also contains moving charges and will experience a force on it if it is placed in a magnetic field. Starting with the equation for a moving charge, derive an equation for the force on a current carrying wire.

$$F = BIL$$

$B =$ Magnetic field strength in Teslas (T)

$I =$ Current in the wire (A)

$L =$ Length of the wire (L)

Magnetic Force Problems:

For each problem calculate the missing value and draw a diagram of the force, field, and direction of the velocity or current.

1. A positive charge of 0.55 C moves to the right at 100 m/s and enters a magnetic field of 0.80 T directed downward into the page. What is the magnitude and initial direction of the force on the charge?

Draw and Label a diagram of the problem

2. A straight wire of 5.0 m long conducts a current of 4.00 A toward the bottom of the page, if the wire experiences a force of 0.02 N to the left. What is the magnitude and direction of the magnetic field?

Draw and Label a diagram of the problem

3. A magnetic field of 0.015 T is directed into the page. Find the force on a straight 0.75 m long wire with a 15 amp current. If the force on the wire is directed toward the bottom of the page, what is the direction of the current?

Draw and Label a diagram of the problem

4. An electron traveling at 10,000 m/s to the East enters a uniform magnetic field and experiences a force of 9.0×10^{-11} N directed up (out of the page). What is the magnitude and direction of the magnetic field? $q_e = 1.6 \times 10^{-19}$ C

Draw and Label a diagram of the problem