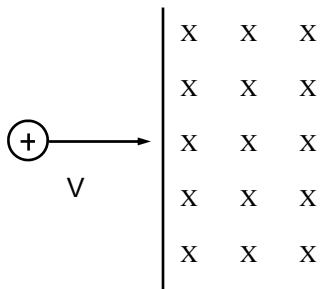


- Two charged particles are projected into a region where there is a magnetic field perpendicular to their velocities. If the particles are deflected in opposite directions, what can you say about them?
- Suppose an electron is chasing a proton up this page when suddenly a magnetic field pointing into the page is applied. What would happen to the particles?
- Why does the picture on a television screen become distorted when a magnet is brought near the screen?



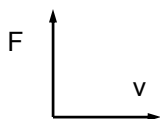
- A proton moving horizontally enters a region where there is a uniform magnetic field perpendicular to the proton's velocity, as shown below. Describe the proton's subsequent motion. How would an electron behave under the same circumstances?

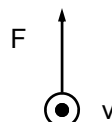
- At a given instant, a proton moves in the positive x direction in a region where there is a magnetic field in the negative z direction. What is the direction of the magnetic force?
- A duck flying due east passes over Atlanta, where the magnetic field of the earth is $5.0 \times 10^{-5} \text{ T}$ directed north. The duck has a positive charge of $4.0 \times 10^{-8} \text{ C}$. If the magnetic force acting on the duck is $3.0 \times 10^{-11} \text{ N}$ upward, what is the duck's velocity?

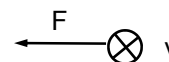
- A proton moves eastward in the plane of Earth's magnetic equator so that its distance from the ground remains constant. What is the speed of the proton if Earth's magnetic field points north and has a magnitude of $5.0 \times 10^{-5} \text{ T}$?

- A wire carries a 10.0 A current at an angle 90 degrees from the direction of a magnetic field. If the magnitude of the magnetic force on a 5.00 m length of the wire is 15.0 N , what is the strength of the magnetic field?

- Find the direction of the magnetic field for a positively charged particle moving in each situation below if the direction of the magnetic force acting on it is as indicated?







- _____ 1. What is the direction of the force on an electron that is traveling to the right in a magnetic field that is directed OUT of this page?
- a. into the page
 - b. right
 - c. up the page
 - d. down the page
- _____ 2. The hand rule used for the direction of the force on a charged particle in a magnetic field applies
- a. to both positive and negative charges
 - b. only to negative charges
 - c. only to positive charges
 - d. only when the particle is moving parallel to the field
- _____ 3. Which force field can accelerate an electron, but never changes its speed?
- a. both electric and magnetic
 - b. electric field
 - c. magnetic field
 - d. neither magnetic nor electric
- _____ 4. What is the path of an electron moving parallel to a uniform magnetic field?
- a. ellipse
 - b. circle
 - c. straight line
 - d. parabola
- _____ 5. The force on an electron moving in a B field will be the largest when its direction
- a. is at an angle other than 90 degrees to the B field direction
 - b. is the same as the B field direction
 - c. is exactly opposite the B field direction
 - d. is perpendicular to the B field direction
- _____ 6. A charged particle moves perpendicularly through a B field. The effect of the field is to change the particle's
- a. energy
 - b. mass
 - c. direction
 - d. charge
- _____ 7. B fields do not interact with
- a. stationary electric charges
 - b. stationary permanent magnets
 - c. moving permanent magnets
 - d. moving electric charges
- _____ 8. A wire carrying a current is bent into a loop. The magnetic field is strongest
- a. within the loop
 - b. on the wires leading up to the loop
 - c. outside the loop
 - d. where the loop is located
- _____ 9. A current in a long, straight wire produces a magnetic field. These magnetic field lines
- a. form circles that pass around the wire
 - b. form circles that pass through the wire
 - c. come in to the wire from infinity
 - d. go from the wire out to infinity