



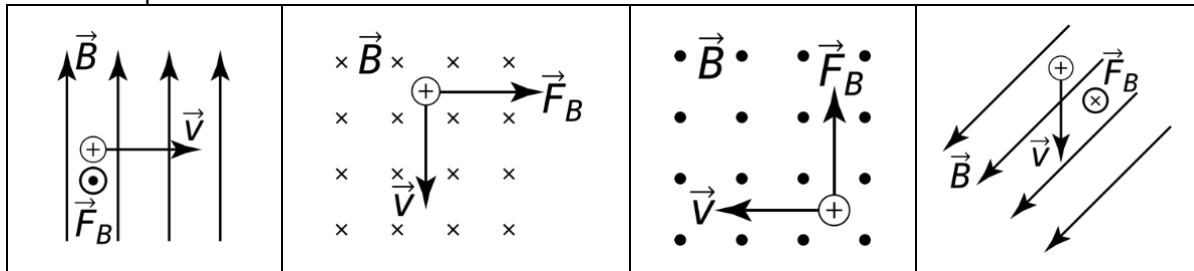
Flipping Physics Lecture Notes:
 Magnetic Force Direction (Right-Hand Rule)
<http://www.flippingphysics.com/magnetic-force-direction.html>

Please recognize that the magnetic field is a vector. To that end, we need to know the direction of the magnetic force acting on an electric charge moving in a magnetic field. For that we use ...

The Right-Hand Rule: [Don't be too cool. Limber up. Find your right hand.]

- Fingers point in the direction of the electric charge velocity.
- Fingers curl in the direction of the magnetic field.
 - It's a good rule of thumb¹ to start at 90°.
- Thumb points in the direction of the magnetic force on a positive charge.
 - For a negative charge, the thumb points 180° from the direction of the magnetic force.
 - Make sure your thumb points normal to the plane created by the velocity of the electric charge and the magnetic field.
 - In other words, realize the direction of the magnetic force is always normal to the plane created by the velocity of the electric charge and the magnetic field.
- Realize, the cross-product version of the magnetic force equation also gives you the direction of the magnetic force in terms of unit vectors.
- Since examples of this concept require vectors in all three dimensions, we introduce two symbols to indicate direction perpendicular to the page. A dot for out of the page, and an X for into the page, like the pointed tip and fletching (feathers) of a flying arrow respectively.

A few examples:



¹ Ha ha ha!