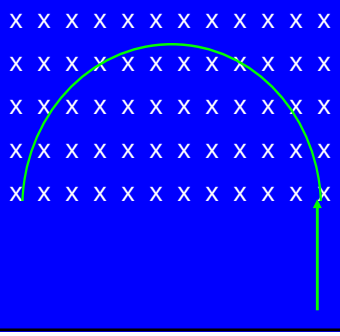
ConcepTest 27.4b Mass Spectrometer II

A proton enters a uniform magnetic field that is perpendicular to the proton's velocity. What happens to the kinetic energy of the proton?

1) it increases
2) it decreases
3) it stays the same
4) depends on the velocity direction
5) depends on the *B* field direction

The velocity of the proton changes direction but the magnitude (speed) doesn't change. Thus the kinetic energy stays the same.



ConcepTest 27.7b Magnetic Force on a Loop II

If there is a current in the loop in the direction shown, the loop will:

1) move up
2) move down
3) rotate clockwise
4) rotate counterclockwise
5) both rotate and move

Look at the North Pole: here the magnetic field points to the *right* and the current points *out of the page*. The right-hand rule says that the force must point *up*. At the south pole, the same logic leads to a *downward* force. Thus the loop rotates *clockwise*.