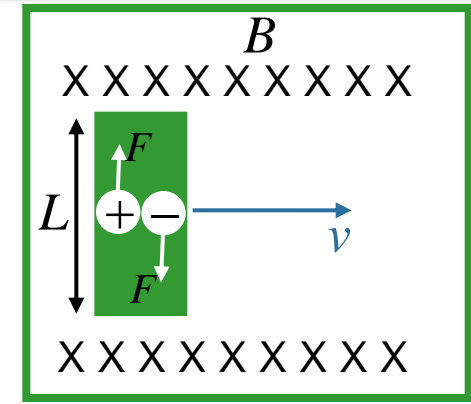


# The Big Idea

When a conductor moves through a region containing a magnetic field:

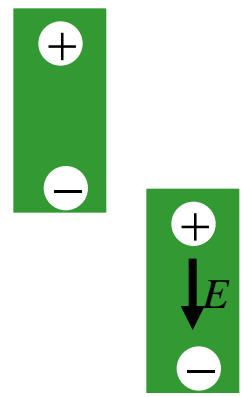
Magnetic forces may be exerted on the charge carriers in the conductor

$$\vec{F} = q\vec{v} \times \vec{B}$$

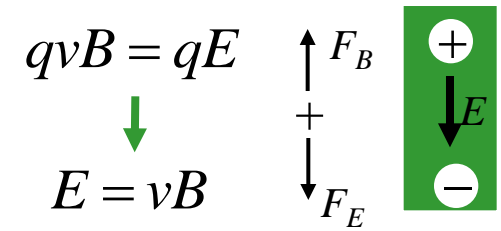


These forces produce a charge separation in the conductor

This charge distribution creates an electric field in the conductor



The equilibrium distribution is reached when the forces from the electric and magnetic fields cancel



The equilibrium electric field produces a potential difference (*emf*) in the conductor

$$V = EL \rightarrow V = vBL$$