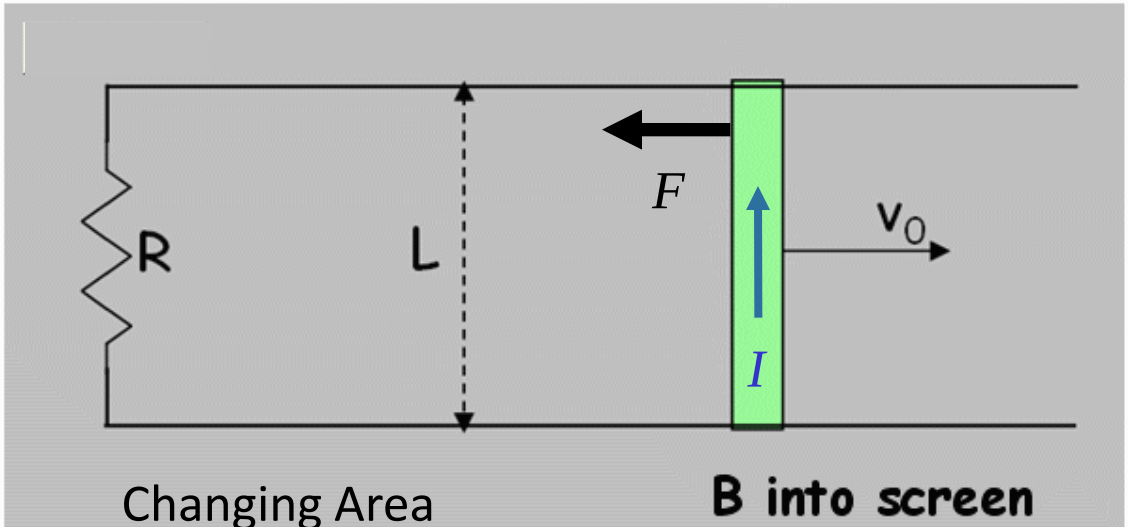
CheckPoint 2b

A conducting bar (green) rests on two frictionless wires connected by a resistor as shown.



Energy

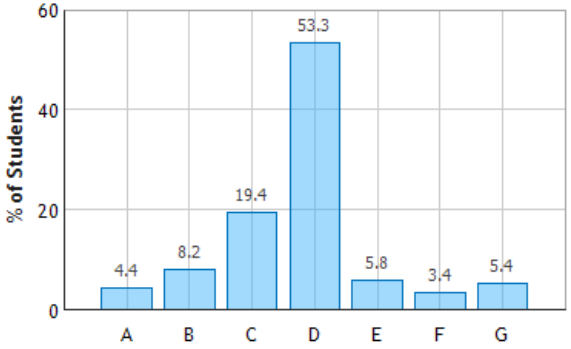
External agent must exert force F to the right to maintain constant v

This energy is dissipated in the resistor!

The entire apparatus is placed in a uniform magnetic field pointing into the screen, and the bar is given an initial velocity to the right.

The current through this bar results in a force on the bar

A. down
B. up
C. right
D. left
E. into the screen



Current up through bar

$$\vec{F} = I\vec{L} \times \vec{B} \longrightarrow F \text{ points to left}$$

$$F = \left(\frac{vBL}{R}\right)LB \longrightarrow P = Fv = \left(\frac{vBL}{R}\right)LBv = I^2R$$