# Quiz 8

The following information may or may not be of use:

$$\text{Lorentz Force Law: } \vec{F} = q\left(\vec{E} + \vec{v} \times \vec{B}\right)$$

$$\text{Electrical Power: } P = I\Delta V$$

In a region of space there is a uniform magnetic field with magnitude $\left|\vec{B}\right| = 5$ T pointing out of the page. A neutral metal bar of length $L = 0.2$ m slides horizontally with speed $|\vec{v}| = 500\ \frac{\text{m}}{\text{s}}$ across two fixed conducting rails with negligible friction but good electrical contact. The two metal rails are connected by a resistor with resistance $R = 220\ \Omega$.
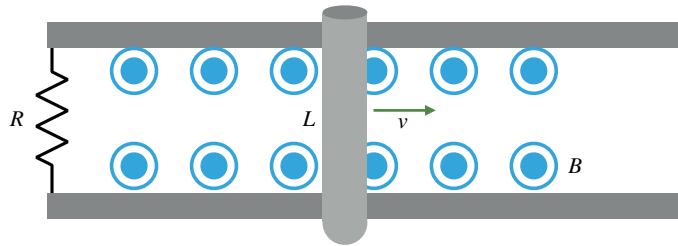
1. What direction is current flowing through the resistor? Indicate by drawing an arrow on the diagram.

2. At this instant, what is the power dissipated in the resistor?

3. The speed of the metal bar will _____ with time.

   (a) Increase
   (b) Remain constant
   (c) Decrease