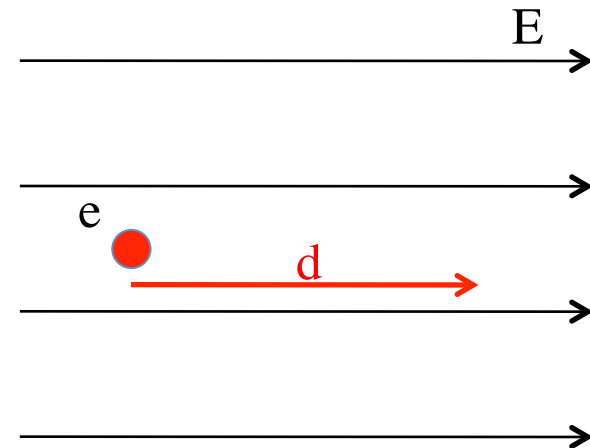


## Problem 23.47

If you are talking about stopping a particle in some period to TIME, you need to look at the body's *impulse* and *momentum change*. If you are talking about stopping a particle over some DISTANCE, you need to look at work and energy. This is a work/energy problem. Noting that an electron moving *with* an electric field will slow down, we can write:



$$W_{\text{net}} = \Delta KE$$

$$\Rightarrow W_{\text{E does on electron in stopping it}} = KE_2 - KE_1$$

$$\Rightarrow \vec{F}_E \bullet \vec{d} = KE_2 - KE_1$$

$$\Rightarrow |\vec{F}_E| |\vec{d}| \cos \theta = \cancel{KE_2} - KE_1$$

$$\Rightarrow (eE)d(\cancel{\cos 180^\circ}^{-1}) = -KE_1$$

$$\Rightarrow -(eE)d = -KE_1$$

$$\Rightarrow E = \frac{KE_1}{ed}$$