



The electron has a rest energy of 511 keV. Terence Tightwad, who understands classical physics but has never studied special relativity, proposes a particle accelerator where an electron is accelerated from rest through a potential difference of 750 kV, giving it a kinetic energy of 750 keV. If the classical expression for kinetic energy always held true, what would be the final speed,  $u$ , of the electron in terms of  $c$ ? What is the speed of this electron as predicted by special relativity? (This is what a disappointed Terence would measure, using techniques such as time-of-flight detection.)

Why?
<b>Check your Why? with Mr. C before continuing.</b>
How?
<b>Show all work including substitution with units.</b>

Open the short cut **IP Accel Elec** in the folder on one of the lab stations. Enter the answer you found above. Check your answer by hitting the check button. If your answer is not correct follow the interactive steps below the problem to work through the solution. Write the correct solution on the back of this page.