

Conservation of Energy and Ee.

Remember: If you have a charge particle moving through an electric field, the 2 energies you are concerned with are Ek and Ee.

If the charged particle is accelerating and thus gaining Ek, it is losing Ee and moving with the electric field.

If you are asking a charge particle to move against the electric field, you are storing/gaining Ee and thus the particle must be slowing down and losing Ek. This principle of conservation of energy helps solve problems!

Rutherford's Gold Foil Experiment

If an +ve alpha particle was speeding towards a +79 gold nucleus, it would be gaining Ee, thus it must be slowing down and losing Ek.

$$+\Delta E_e = -\Delta E_k \quad (\text{sound familiar??})$$

At the point the alpha particle stops (and will soon turn around), it has no Ek. Thus...all the Ek it had originally has transferred to Ee. (sound familiar??)