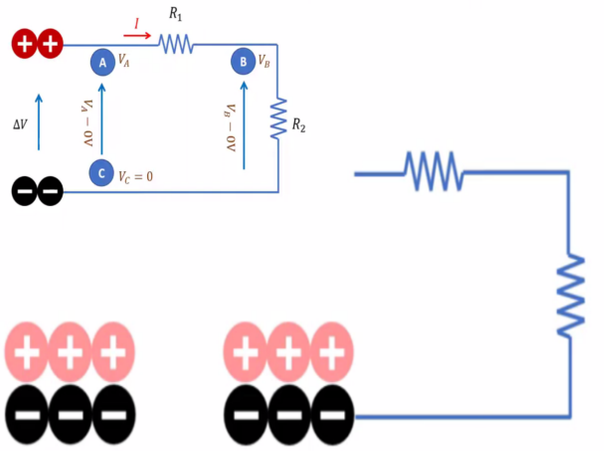
To Summarise:

- A Field can be employed to represent the effect of natural forces on objects, like gravity on an apple.
- When we act against a field, we do negative work, in the sense that we lose energy. In doing so, we give the object on which we do the work, potential energy.
- This potential energy, will allow the object, when left unconstrained, to be affected yet again by the forces which would naturally act upon it.
- In the case of our apple, the potential energy gives it the ability to fall back down to Earth at a certain speed. By the time it gets back to the earth's surface, all its potential energy will have been turned into Kinetic energy, the energy required for a mass to be accelerated from rest to a specific velocity.

Electric Fields & Potentials (3)



So what we can do is separate positive and negative charges, much in the same way as we took some of the water away from the pond and into the reservoir.

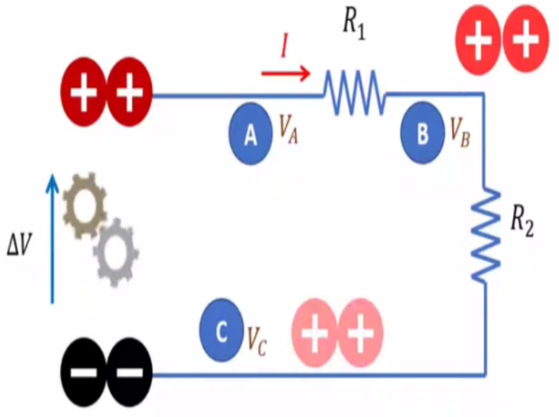
This will create a voltage difference ΔV.

We then give the charges a different path (circuit) through which to flow to come together again under the action of the electric field.

Note that the colour of the charges represents their potential energy: the dark red is associated with the highest potential and the pink with the lowest.

Voltage References (1)

- So we said that we assume that electric current is made up of positive charges flowing from a point of greater potential to a point of lower potential.
- Since potential is a relative measure between two points, we may very well assign a value of zero to the lowest potential point so that any point X, the voltage will be $V_X - 0V$.



- If we set point C as a reference and assign a value of zero to the voltage at that point then

$$V_A - V_C = V_A = \Delta V$$

$$V_B - V_C = V_B$$

Voltage References (2)

- The 0V reference is often called ground or earth and we will see why shortly.
- In the case of the battery, the point to which we would usually assign zero volts for instance, would be the negative terminal.
- At this point we should highlight that the a battery, and any device which uses energy to provide a constant voltage, and thus a constant current over time, is termed a DC power supply.
- The constant current which is produced by the DC power supply is termed DC current.
- We will see later why we use the term power instead of voltage for our DC supply.