

## Physics: Electricity 1

### Whole unit overview

Learning Outcomes		Suggested Teaching Activities	Resources
4.2 (b)	<p>State that current is related to the flow of charge.</p> <p>Use and describe the use of an ammeter.</p>	Use simple circuits to measure current.	<p>This site contains a series of useful pages relating to electricity and magnetism. These are relevant to most of this unit.</p> <p><a href="http://www.galaxy.net/~k12/electric/index.shtml">http://www.galaxy.net/~k12/electric/index.shtml</a></p>
	<p>Show understanding that a current is a rate of flow of charge and recall and use the equation <math>I = Q/t</math>.</p> <p>Distinguish between the direction of flow of electrons and conventional current.</p>	A Van de Graaf generator can be used with a microammeter to show that current is a flow of charge.	<p>For some interesting information about static electricity from the Theater of Electricity, including a video of how the Van de Graaf works</p> <p><a href="http://www.mos.org/exhibits?online_exhibits.html">http://www.mos.org/exhibits?online_exhibits.html</a> click on Theater of Electricity, then video gallery, click on How the Van de Graaf generator works.</p> <p>Any mention of the Van de Graaf generator and students are asking about lightning – try this site also about the work of Benjamin Franklin; click on Franklin's Kite.</p>
4.2 (c)	State that the e.m.f. of a source of electrical energy is measured in volts.		
	Show understanding that e.m.f. is defined in terms of energy supplied by a source in driving charge round a complete circuit.	An analogy with water being pumped round a closed system (e.g. central heating) can be useful here to enable the students to have a mental picture which helps them to distinguish between current (the water) and e.m.f. (the energy from the water pump).	<p>A good introductory lesson on current and e.m.f.</p> <p><a href="http://www.mos.org/sln/toe/tennisballs.html">http://www.mos.org/sln/toe/tennisballs.html</a></p>

4.2 (d)	<p>State that the potential difference across a circuit component is measured in volts.</p> <p>Use and describe the use of a voltmeter.</p>	Continue the circuit work, measuring potential differences with a voltmeter.	
4.2 (e)	<p>State that resistance = pd/current and understand qualitatively how changes in p.d. or resistance affect current.</p> <p>Recall and use the equation <math>R = V/I</math>.</p> <p>Describe an experiment to determine resistance using a voltmeter and an ammeter.</p> <p>Relate (without calculation) the resistance of a wire to its length and to its diameter.</p>	<p>Extend the circuit work using an ammeter and a voltmeter to measure <math>I</math> and <math>V</math> and so calculate resistance of a resistor.</p> <p>By using samples of nichrome or constantan wire of different lengths and diameters suitable resistance comparisons can be made.</p>	Why not create a vocabulary quiz at this stage to test knowledge in a different way?
	Recall and use quantitatively the proportionality between resistance and the length and the inverse proportionality between resistance and cross-sectional area of a wire.	Extend the experimental resistance work to give quantitative results.	
4.2 (f)	<p>Recall and use the equation <math>P = IV</math> and</p> <p><math>E = Ivt</math>.</p>		