Syllabus ref.	Learning objectives	Suggested teaching activities
4.6.1 Electro-magnetic induction	• Show understanding that a conductor moving across a magnetic field or a changing magnetic field linking with a conductor can induce an e.m.f. in the conductor • Describe an experiment to demonstrate electromagnetic induction • State the factors affecting the magnitude of an induced e.m.f.	This topic really must be demonstrated by experiment. One such includes moving a permanent magnet into and out of a coil, connected to a very sensitive meter. This can be extended to show the same effect using an electromagnet moved in and out of the coil and then by simply switching the electromagnet on and off. **Extension activity:** extend the experiments above to show the effects of the strength of the field (use a stronger permanent magnet or increasing the current in the electromagnet), the speed of movement and the number of turns per metre in the coil. **Resource Plus** **Experiment:** How to make an electromagnet This experiment focuses on an investigation to measure the strength of an electromagnet. Links with 4.6.4 The magnetic effect of a current and 4.1 Simple phenomena of magnetism Electromagnetic induction: www.ndt-ed.org/EducationResources/HighSchool/Electricity/electroinduction.htm www.youtube.com/watch?v=hajIlGHPeuU
4.6.1 Electro-magnetic induction	• Show understanding that the direction of an induced e.m.f. opposes the change causing it • State and use the relative directions of force, field and induced current	Induce a current in a solenoid by inserting a known pole at one end. Then pass a current through the solenoid in the same direction as the induced current; show that the field opposes the original insertion of the magnet. There are various rules for remembering the relative directions of the force, field and induced current of which Fleming's right-hand rule is one. Lenz's law: http://hyperphysics.phy-astr.gsu.edu/hbase/electric/farlaw.html#c2l www.youtube.com/watch?v=KGTZPTnZBFE http://video.mit.edu/watch/physics-demo-lenzs-law-with-copper-pipe-10268/ www.youtube.com/watch?v=uGUsTWjWOI8