



*working together to enhance understanding,
commitment and participation in engineering*

Engineering the Future

**Engineering experiences established
within the science and physics
curricula.**

***'It's more fun, so you want to know more about physics.'
'A lot of work: challenging but you've accomplished
something, it 'clicks' and you remember it.'
'... instead of being told step by step what to do you get to
vary it yourself.'
'... it just made you feel really smart once you'd done it.'***

- pupils involved in the Engineering the Future project

***'... they learn for themselves and remember better in this type
of work'
'... having fun, but learning at the same time'
pupils are creative and active learners, using their knowledge
and, often, imagination to solve a problem.***

- teachers involved in the Engineering the Future project

Year	Title	Description
S6	Advanced Higher Investigations in School	Practical Investigations into the Speed of Light or the Mobility of Charge Carriers.
S6	Advanced Higher Investigations at University	Physics staff in the school working with electronic and electrical engineering colleagues and doctoral researchers developed six advanced investigations, ranging from ultrasonic characterisation of viscoelastic materials to electrical sterilization of liquids.
S1/2	Bat Monitoring	Using bat monitors to listen to sounds inaudible to humans and learning about ultrasound and its uses.
S1	Building a Lighthouse	Planning and building a simple model of a functioning lighthouse with a fully operational circuit and appropriate supporting structure.
S1/2	Carnoustie Wind Project	Optimising a wind turbine to produce the maximum power/energy and consideration of the benefits and problems associated with wind turbines, including issues of planning and location within the local environment.
S1	Fun with Bridges	An engineering challenge with an enterprise link involving the construction and testing of bridges.
S2/3	Hot Potato	Calibrating a thermistor and using it to monitor the differences in temperature of a heated potato as it cools; exploring the relationship between temperature and resistance.
S3	LEDs and Photodiodes	Using commercially available light emitters and receivers to investigate how the application of the principle of sending signals through optical fibre could be improved
S2/3	Light and Dark	Investigating how a light sensor (LDR) reacts to light brightness; working through a staged process illustrating how automatic street lights work.
S1/2	Mars Rover	Planning a Mars mission (balancing scientific benefit against budget and other practical considerations) and specific aspects of electronic engineering relating to robotics.
S4	Nuclear Debate	Learning about engineering applications related to radioactivity and nuclear physics, including building a radiation detector and managing a nuclear plant simulator.
S3/4	PETS Course	An integrated Physics, Economics and Technological Studies course newly designed by the school specifically for school students who are interested in an engineering career.

Year	Title	Description
S3/4	Pimp My Trolley Engineering	Designing, building and testing a crumple zone for a lab trolley (as a model for a motor vehicle).
S3	Radio Project	Building a radio with easily sourced materials such as toilet roll tubes, crystal earphones, diodes, terminal blocks, aerials and capacitors.
S1/2	Security Unit	Designing and building electronic security systems.
S3/4	Ultrasound	Using ultrasound to measure distance in a Health Physics unit and learning about other engineering applications such as sonar, weld testing and car reversing indicators.
S5/6	Wheatstone Bridge	Building and modelling a realistic engineering scenario involving Wheatstone Bridges.
S5/6	Wii Sports Unit	Introducing some of the ideas of mechanics at the level of SQA Higher Physics by considering the physics which a software engineer would need to implement to make the Nintendo Wii-Sports game realistic.
S1	Wind Turbines	Developing an engineering-based unit of work related to wind turbines in the context of studying renewable energy sources. The challenge is to find a design configuration to produce maximum power.

For further information please contact:

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