

## No. 218 Autumn '06 Contents

- 1 News - Smoking machines in schools - Is science uncool?
- 2 ICT / Physics - Audacity - adopt an audacious approach to the study of sound
- 6 Supporting Scottish Science Education - CPD news
- 8 Physics - Half-life demonstrations

Published by SSERC, 2 Pitreavie Court,  
South Pitreavie Business Park,  
Dunfermline KY11 8UB

Telephone: 01383 626070

Fax: 01383 842793

E-mail: sts@sserc.org.uk

Web: www.sserc.org.uk

Managing Editor: Fred Young

Editor: Ian Birrell

Copyright is held to be waived only for bona-fide educational uses within current Scottish member EAs, schools & colleges.

### Is science uncool?

The papers have been full of gloom-and-doom articles recently, about how the apparently stifling effects of risk aversion, boring teaching methods and exam-led education has resulted in a decline in the number of pupils taking Chemistry and Physics Higher. "Pupils are being denied the chance to carry out scientific experiments because teachers are being put off by health and safety regulations" [1], "SCIENCE AT SCHOOL IS UNCOOL" [2], "ACTIVITY BAN HAS MADE PUPILS SOFT AND SICKLY" [3]. Professor Anne Glover, the new Chief Scientific Adviser for Scotland, has called for a greater emphasis on practical activities to turn on youngsters to the excitement of the essentially investigative nature of science. Director-General of the CBI Richard Lambert recently said "We must smash the stereotypes that surround science and rebrand it as desirable and exciting; a gateway to some fantastic career opportunities" [4].

Whilst the premises put forward by Professor Glover may make a case for why kids are voting with their feet, we need to elicit other factors, which may affect the figures, as well as suggest reasons to be optimistic about the future.

We may be forgiven for being concerned that health and safety regulations are one of the main culprits since it is a major part of our raison d'être. Health and safety regulations need to be wisely applied and proportionate to the risks. Safety myths often suffocate the educational atmosphere like will-o'-the-wisps

SSERC Bulletin 218 Autumn 2006

### The use of smoking machines in schools

SEED has advised that the use of smoking machines indoors, even in a fume cupboard and following the control measures resulting from a suitable risk assessment as outlined in *SSERC Bulletin 217*, is illegal. SSERC has been informed that teachers carrying out this demonstration in a laboratory are liable to be prosecuted. However, SEED states that it would be legal to demonstrate the smoking machine outdoors.

We believe that the use of the smoking machine in schools is effective, valuable and should be exempt from *The Smoking, Health and Social Care (Scotland) Act, 2005*.

For a full position statement see [www.sserc.org.uk/public/smoking\\_generic.pdf](http://www.sserc.org.uk/public/smoking_generic.pdf)



e.g. in the *Scotsman* [1] the bell in the bell jar experiment can no longer be practised because the restrictions on producing vacuums in classrooms are so strict that manufacturers don't sell them (sic) any more - just don't have any lit cigarettes around! In the majority of school experiments, the risks are trifling and teachers need not be afraid, given that the appropriate control measures are applied. There is seldom any good health and safety reason for not doing an experiment.

For too long the examination tail has wagged the curriculum dog. The powers that be and higher education have measured children's success in what are intrinsically practical, skills-laden, problem-solving subjects by a relentless analysis of their ability to recall thousands of facts. Countless numbers of kids are turned off the subjects by being marginalised because they don't fit the academia profile or, even if they do, are bored out of their skulls by the relentless tedium of the courses. Those who jump on the trendy, online bandwagon by developing new, socially and technologically aware 'courses' should beware repeating the curricular mistakes of the past. Teachers should question whether they cover scientific methodology or are just another excuse to peddle yet more scientific facts in the guise of being aware of social, moral and technological gadgetry issues. The debate has "showed that people want a curriculum that will fully prepare today's children for adult life in the 21st century, be less crowded and better connected, and offer more choice and enjoyment." This was stated in *The Curriculum for Excellence (CfE)* [5], published by the Curriculum Review Group in 2004. Existing courses must take account of the implications for the 3-18 curriculum, which may result from the application of the aims of the CfE. At present there is a curriculum review in science based on implementing the principles of *Challenge and enjoyment, Breadth, Progression, Depth, Personalisation and choice, Coherence*

and Relevance. We await the results of their deliberations with interest.

So is the assessment tail still wagging and is there any room for optimism? *Assessment is for Learning (AifL)* [6] is a national initiative, which seeks to develop a streamlined and coherent system of assessment for schools that will support learning. The trend is towards the use of *Formative Assessment* [7], [8], [9], [10] & [11] techniques rather than *Summative Assessment* which is inevitably the result of reliance on the recall of facts. Summing up, science is probably not cool and never will be - so last-century description. Now 'wicked' or 'bad' - that's what we should be aiming for! Many factors have led to schools doing less practical work in science. It should undoubtedly be better funded than it is [12] and the present arrangements - courses, examinations and teaching methods - need reforming.

[1] [news.scotsman.com/scotland.cfm?id=1174302006](http://news.scotsman.com/scotland.cfm?id=1174302006)

[2] *Science at School is Uncool* by Thomas Smith, Sunday Mirror, August 13th 2006

[3] *Activity Ban has made Pupils Soft and Sickly* by Ron Moore, Daily Mirror, Aug., 2006

[4] [news.bbc.co.uk/2/hi/uk\\_news/education/4780017.stm](http://news.bbc.co.uk/2/hi/uk_news/education/4780017.stm)

[5] [www.acurriculumforexcellencescotland.gov.uk/about/index.asp](http://www.acurriculumforexcellencescotland.gov.uk/about/index.asp)

[6] [www.ltsotland.org.uk/assess/](http://www.ltsotland.org.uk/assess/)

[7] [www.learningcurve.info/fais/overview.htm](http://www.learningcurve.info/fais/overview.htm)

[8] [www.ise5-14.org.uk/members/Exemplar\\_Materials/Overview.htm](http://www.ise5-14.org.uk/members/Exemplar_Materials/Overview.htm)

[9] [www.ise5-14.org.uk/members/Gallus/News\\_and\\_Background.htm](http://www.ise5-14.org.uk/members/Gallus/News_and_Background.htm)

[10] [www.ise5-14.org.uk/members/TSEC\\_DVD/News\\_and\\_Background.htm](http://www.ise5-14.org.uk/members/TSEC_DVD/News_and_Background.htm)

[11] [www.ise5-14.org.uk/members/Exemplar\\_Materials/Overview.htm](http://www.ise5-14.org.uk/members/Exemplar_Materials/Overview.htm)

[12] *Funding surveys in Physics Departments* by Stuart Farmer, SSERC Bulletins 203 & 210