



Newsletter #4

Spring 2007

SCI-FUN: supporting a Curriculum for Excellence

The SCI-FUN Scottish Science Technology Roadshow is primarily a national resource, which takes interactive science, talks and workshops to areas throughout the country, both in the Central Belt and also remote from existing science centres. Offering an imaginative blend of education and entertainment, it promotes science and engineering, encouraging young people to pursue the study of science-related subjects to a higher level, ultimately to produce more young scientists and engineers.

Aiming from the outset to support teachers in enthusing their pupils in science, SCI-FUN also supports them in raising the awareness of pupils (and their parents) of the career opportunities available through skills and qualifications in science. SCI-FUN offers senior pupils in secondary schools the opportunity to train as 'explainers' during sessions, and to undertake short work experience placements.

In providing support for students in their personal development and the acquisition of communications skills, SCI-FUN contributes to supporting the growing community of young scientists better able to talk about their science in society at large, to communicate effectively within the scientific community and to encourage some to become the much needed science teachers of the future. Science is a priority for a knowledge based economy and as pupils continue to opt out of science subjects there is a continuing need for stimulating experiences to help promote science beyond S2, at Higher and Advanced Higher and at university level.

SCI-FUN provides a key element in the emerging pattern of science education in Scotland, supporting formal education and providing the roadshow style of outreach, which naturally complements the Science Centres.

PP4SS/SCI-FUN Nuffield student wins UK science prize (for the second year...)

Alan Walker, senior lecturer in the School of Physics at Edinburgh writes: "In summer 2006, Holly Batchelor from The Mary Erskine School, whilst a Nuffield Bursar, worked with myself for PP4SS (Particle Physics for Scottish Schools) and Peter Reid (SCI-FUN's Development Officer) on a cosmic ray hodoscope, the PP4SS cosmic ray 'doorway' and on making a small, inexpensive cloud chamber aimed at schools.

"On 23rd February at the Royal Society, which hosted the 2007 BA Crest Science Fair, Holly won the highest prize, and will be representing the UK at the Intel International Science Fair in May 2007 at Albuquerque in the US.

"Congratulations to Holly, whose overwhelming enthusiasm for the project won through and clearly made all the difference in the face of tremendous competition from the 100+ finalists. There was an enormously wide range of projects of an incredibly high standard from all the young scientists taking part. All those of us involved are extremely delighted, and completely stunned!"

From the BA website: "Holly, who heads off to university this autumn to study physics, said: 'I had great fun doing this project. It gave me a great insight into what studying at university will be like and that there are many more branches to physics than you get to study at school. It was only supposed to be a six-week placement, but I keep going back to Edinburgh university to help out.'

Frances Chapman writes: "As regional coordinator for Nuffield Bursaries in Scotland I am delighted that, as one of three Nuffield students from

Scotland attending the BA Crest Science Fair, Holly has scooped the top prize. She will no doubt be a great ambassador for her school, the University of Edinburgh and the Nuffield Bursary scheme, and we wish her every success!"

This isn't the first Nuffield student working with Alan and Peter to win a Crest prize: Ingrid Burt from Beeslack School in Penicuik, whose project on time dilation was undertaken during the summer of 2005, won a national award at the BA Crest Science Fair in London in 2006, allowing her to attend the London International Youth Science Week last summer. Ingrid is now studying Physics at the University of Cambridge.



Holly Batchelor with her award-winning "Cosmic Rain" display

Teachers' Comments

We have been very fortunate to have had a visit from SCI-FUN for many years. Both pupils and staff look forward to enjoying the fun side of Science. Our pupils find it helpful to consider science as a career and to see 'young scientists' in action. I hope it continues into the future.

West Lothian

[The school quoted here booked a theatre group to deliver a science-themed show for S2.] The pupils enjoyed it most of the time, but we were not impressed. They will not be invited back again! SCI-FUN is the "show" to have. They are with us today and tomorrow and are proving a smash hit with pupils and staff alike (and not just the science staff!)

Scottish Borders

A virtual science centre

Since becoming the SCI-FUN SCOTTISH SCIENCE TECHNOLOGY ROADSHOW in 2001, SCI-FUN has established a reputation in the education community as a "virtual science centre" or a "science centre on the move", providing inspirational and educational activities for entire year groups of young people throughout Scotland. With the particular focus on lower secondary schools the unit established an ongoing programme in some 150 secondary schools in the years 2002 – 2005, some receiving annual visits, others (because of factors such as size and distance) biennial visits, while at the same time introducing new initiatives such as SCI-FUN Primer and the LERU Kids' University, as well as contributing to events in the community.

The SCI-FUN experience

SCI-FUN provides pupils in S1/2 with an opportunity to experience interactive science across the disciplines, inspirational talks on science, and careers information to raise aspirations. This full programme of activities is available to an entire year group within a school, without the inconvenience and associated risks of taking pupils out of school, without the expense of transport and staff cover and without wasting time. Senior pupils in schools hosting a visit have the opportunity to be trained and work as 'explainers' – receiving certification as part of their Personal Record of Achievement.

Increasingly, the careers element of the SCI-FUN Roadshow is being emphasised in schools and a stand-alone subject choice/careers talk and workshop is sometimes offered when a full visit by SCI-FUN is not possible.

Teachers are offered short CPD and familiarisation sessions with the SCI-FUN resources. Subject-specific talks and workshops for senior science classes are being developed in conjunction with colleagues in the University's College of Science & Engineering.

Evening sessions held during a SCI-FUN visit to an area (usually 2-3 days), offer parents and others in the local community an opportunity to participate – helping to demonstrate the place and relevance of science in today's society.

SCI-FUN – the core product

From the original launch in 1993 the SCI-FUN Roadshow has aimed to help teachers in conveying to their pupils the fascination and excitement of science and the importance of science to life in the modern world. It has also aimed to provide students in the College of Science and Engineering at The University of Edinburgh the opportunity to acquire transferable skills especially in communication and presentation.

We visit 80-100 schools each year throughout Scotland, and approximately 20,000 pupils take part in the roadshow. Sessions are timed to fit with the school timetable, minimising disruption.

- The entire S2 year-group is included – up to 300 pupils per school – with more limited access for P6/7 classes. (The exhibition requires a large hall, available for at least 24 hours.)
- The activities are available within the school, allowing all teachers access at their convenience, and reducing the time taken from classroom teaching for both pupils and teachers.
- The cost of travel is eliminated, or reduced for visiting groups.
- The three sciences are given a balanced presentation.
- The importance of mathematics to support science is emphasised.
- Other relevant subject areas such as technology and computing are included.
- For the most part, the pupils are actively involved and supervised.
- Approximately 30 minutes are spent in the hands-on area.
- S5/6 pupils are trained as helpers.
- Each group of 5 or 6 pupils is guided by a university student or senior pupil.

SCI-FUN and the transition years

It is now widely accepted that some of the difficulty in recruiting young people into science and retaining their interest may be addressed by smoothing the transition in science from primary to secondary school. Increasing demand from teachers in the Primary sector has led to the development of materials & activities suitable for younger pupils (P5-P7) in their classrooms. SCI-FUN Primer has been well received in many cluster schools as an additional resource to raise awareness of the importance of science and technology.

The activities are designed to provide senior Primary pupils with an introduction to the full Secondary SCI-FUN – providing a continuum of experience.

SCI-FUN Primer is also suitable for "twilight" sessions for teachers within the cluster. In this way, SCI-FUN can help to strengthen the links between primary school teachers and science staff in the secondary school and also ease pupils' transition, retaining their interest in and enthusiasm for science.

Typically SCI-FUN visits three secondary schools per week and additional activities are subsequently offered to each of these schools – SCI-FUN Primer for P7 classes in the cluster schools, evening sessions for pupils and their parents, and specialist talks and workshops offered by individuals from the University. Since the pilot of SCI-FUN Primer in 2004-5 approx 100 Primary Schools have been visited – more than 5000 pupils.



science and technology
for primary schools



Two Science Shows per Session



A Careers Presentation



Up to Forty Hands-on Exhibits

Teachers' Comments

I have been lucky enough to have had a visit from SCI-FUN for the last three years. The visit team bring a huge science show and exhibits which we use for the whole of S2. The quality of the presentations is excellent and the pupils clearly enjoyed them. The time spent with the pupils on the interactive exhibits was great fun. And behind the enjoyment and the serious science message, all the exhibits work really well and the team work very hard to come in, set up, do the show and then dismantle. The organising teacher just turns up and organises the pupils, everything else is done for us.

The SCI-FUN team deliver an effective science show that educates and is fun and from our follow up questionnaires to staff and pupils everyone wants them back next year. This can only happen if the school is able to afford it as they have been in previous years. It is a very worthwhile venture and I certainly hope that adequate funding can be found for it.

East Dunbartonshire

I would like to lend my support to this cause through one simple story.

Last year our numbers choosing physics in S3 fell for the second successive year. As part of a programme of events to reverse this trend we invited SCI-FUN to our school after Christmas.

The main reason for doing this was to encourage S2 pupils to think about the sciences in S3, especially Physics.

Our numbers in S3 this year have increased across each of the discrete science subjects.

We hope to bring them back next year and it would be a pity if organisations such as SCI-FUN are removed.

Inverclyde

Work experience placements with SCI-FUN

In addition to offering senior pupils in the schools being visited by SCI-FUN the opportunity to train as 'explainers' in support of the SCI-FUN Science Presenters, work experience placements are available routinely to schools in Edinburgh and the Lothians and increasingly to schools outwith the area which recognise the value of such placements. For example:

- One pupil from a Highland school stayed with relatives in Edinburgh while doing a week's work experience with SCI-FUN;
- A first-year student of Electrical & Electronic Engineering worked with SCI-FUN during the Easter vacation 2003 because he had been a senior pupil helper when SCI-FUN visited his school the preceding year;

- An autumn placement in conjunction with Physics led to a Nuffield Bursary project at SCI-FUN during the following summer vacation;
- One pupil was the only pupil in his year group who completed the full week of work experience – the others had given up after a day or two and his teacher was surprised that he had completed the full week and impressed by the enthusiasm and commitment he demonstrated;
- Pupils routinely offer to come back and work at events in the future such as science festivals or weekend events at shopping centres.

SCI-FUN – key facts

- Supports teachers in raising the uptake of science at all levels, with minimum disruption to timetables, and minimum demands on the hosting establishment and staff.
- 170 Local Authority secondary schools in Scotland (43% of the total) involved in more than 350 separate visits since 2000 – total secondary school audience of ~60,000 - greatest concentration in Lothians, but also in Dumfries & Galloway, East Renfrewshire, Inverclyde, Highlands and Islands, and others.
- Typically 170-200 pupils per visit (S1/2 and S5/6) for ~2 hours – hands-on, 2 shows and careers presentation with advice on subject choice.
- Extremely well received with very positive feedback and high demand for repeat visits (85% in 2004/5).

Highlights of the schools programme

- The schools bookings diary >90% capacity September 2006 - March 2007
- Highly successful "cluster" events (Secondary + feeder Primaries) in Lourdes Learning Community in Glasgow, Forrester High School in Edinburgh, all schools in Moray and East Renfrewshire and similar events around Scotland.
- Primary Science Fairs at James Gillespie's High School, Loudoun Academy, and Glenrothes, Fife in 2005/6
- Visits to Cumbria in July 2004, 2005 and 2006 funded by Aim Higher.
- 3 schools in Tayside and 2 in Glasgow visited in 2005/6 in partnership with WHAN (Working in Health Access Network) based in Dundee University and Glasgow University. Bookings for 12 Tayside schools in 2006/7
- Prime role taken by SCI-FUN in League of European Research Universities (LERU) Kids' University (in the McEwan Hall and Scottish Parliament, Edinburgh 7 – 13 November 2005 and in Brussels 23 November 2005). Repeat of LERU Kids' University in Playfair Library, McEwan Hall and at King's Buildings in November 2006.
- Invited by European Commission (DG Research) to participate in the launch of Researchers in Europe in Luxembourg and later in the Night of Researchers in Brussels.
- April 2006: The Royal Museum of Scotland requested a return to the Museum during the EISF 2006 following the highly successful 2005 exhibition "SCI-FUN and the Battle of the Sexes!" (in collaboration with MRC).
- SCI-FUN represented the University on the Steering Group for the 2020 S.E.E The Vision Conference organised by West Lothian Council and provided the mentors for The Great Scots Challenge (an enterprising challenge for teams of S5/S6 pupils from all West Lothian schools).
- Work Experience Placements for S4/S5/S6 pupils are offered through Careers Scotland Edinburgh and Lothians (24 places have been offered in the current year)
- A joint proposal from the School of Physics at the University of Edinburgh and SCI-FUN was funded by PPARC to develop PP4SS (Particle Physics for Scottish Schools.) The SCI-FUN Development Officer was instrumental in realising the project in collaboration with Physics and SCI-FUN was responsible for the design and construction of the exhibits.
- In the follow-up to PP4SS, two excellent pupils did projects sponsored by the Nuffield school bursary scheme, with supervision and support from SCI-FUN and the School of Physics.

Student placement scheme

Students have the opportunity to spend 10-20 days each year 'on the road' with SCI-FUN, assisting in the delivery of activities, developing exhibits, writing shows and articles for wide dissemination. These students help to extend the impact of SCI-FUN into the upper secondary school, at the same time gaining valuable experience in transferable skills, while broadening their understanding of science.

SCI-FUN and career/subject choice support

The careers component of the current SCI-FUN is appreciated by the schools. A workshop on subject choice and careers advice, specifically for year groups of S1 & S2 pupils has been developed as a result of a request from a previously-visited school and this has now been requested by several others, as a compromise for a full SCI-FUN visit in a year when this is not possible. The careers advice given has also been an important factor in establishing the confidence of several Local Authorities (notably East Renfrewshire, Dumfries & Galloway, the City of Edinburgh, West Lothian, Moray and Inverclyde), all of which have incorporated SCI-FUN as a core element of the programme in schools.

Teachers' Comments

SCI-FUN has provided high quality, inspirational events – exactly what is needed to provide a motivational boost for pupils to study sciences.

Highland

I have just finished my probation year teaching in the Borders.

I went to school in the Highlands and there were very few events/visits to the school from organisations (and any that were were usually related to English.) When I was in S2 SCI-FUN visited a neighbouring school and S2 classes from my school went to see them. I had always had a mild interest in Science but after seeing SCI-FUN I was adamant that I wanted to work with science in some capacity and made the decision to take all three sciences. I am SO glad I did as I am now doing a job that I love and I can't imagine being as happy in any other job.

SCI-FUN visiting our region was one of the highlights of my school education and in my teaching I strive to make classes/events as interesting and memorable as their shows.

SCI-FUN also helped me and my husband at university by supporting us in developing an innovative project to encourage younger pupils to take up science at certificate levels. The project was runner up in a national competition and we are incorporating it into the syllabus at our school.

SCI-FUN has been an influential part of my life since I was 13.

Scottish Borders

We in Inverness have found SCI-FUN to be a valuable asset in increasing pupils' interest in Science and would think it a real shame if, in view of all the Government concern about dwindling numbers of science students, SCI-FUN should disappear through lack of funding.

Highland

LERU Kids' University



The main aim of the LERU Kids' University is to give S1 pupils a glimpse of university and to inspire them with the excitement of science and research in the hope that some of them will set their sights on a career in science. The theme of the 2006 event was Climate and, with the help of

several individuals from Chemistry, Geoscience, Mathematics and Engineering, SCI-FUN produced a set of posters showing some of the variety of current research into climate change, global warming and how science might provide some answers in the future. Geoscience provided most of the material for the 2006 Edinburgh LERU Kids' University poster, copies of which are available for all schools in Scotland (and elsewhere) and the series of research posters is available for download from the website. This one-off event is an excellent example of the potential for SCI-FUN as a link between Higher Education and Secondary Education, with the capability of communicating the material provided by researchers of any discipline in an accessible format for schools. The materials produced are then available to the research group for use in their own outreach programme.



A panoramic view of pupils attending the LERU event at the McEwan Hall

The Edinburgh International Science Festival



SCI-FUN took part in the 2005 and 2006 Edinburgh International Science Festivals, under the banner of *Discover Science with the University of Edinburgh at the Royal Museum*. In addition to the Hawthornden Court event (right), in which we filled the Museum of Scotland entrance hall, we hosted exhibits and workshops in 2005 on the theme of the differences between the sexes as part of a collaboration with the MRC HRSU.

In each year the Particle Physics for Scottish Schools project (PP4SS) has showcased exhibits from its travelling cluster, including its particle accelerator simulator and cosmic ray detectors, in the museum's *Discover Science Zone*. PP4SS will again be exhibiting in the 2007 Science Festival as 'Particle Physics on the Doorstep' from April 10-14. The two experiments developed and used by Ingrid Burt and Holly Batchelor will be on display.



Evening Sessions – taking science to the wider community

"I was dragged along by my son tonight. Science has always scared me...but tonight was brilliant...now I'm having to be dragged home!"

– A P7 parent at a recent evening show.

Talks and hands-on sessions for the public have always been a feature of SCI-FUN, in the past mainly at science festivals such as Edinburgh, Orkney and Shetland. Recently, however, evening sessions have proved so popular that they have become a regular feature. They are generally offered to P7 pupils with their parents and to Primary School teachers, giving the secondary school and the associated primaries an additional opportunity to work together and to ease the transition from Primary to Secondary.

Evening sessions begin with hands-on access to the roadshow exhibits, followed by a talk on a scientific subject, with demonstrations, multimedia displays and opportunities for volunteers to take

part. The emphasis is on fun, and we try to get over to the audience our passion for science in general, and the ways in which it affects all of our lives.



A tornado in a box



Brian Cameron, SCI-FUN Deputy Director, giant hailstone in hand, presenting the Wild Weather evening show

For more information contact:

Dorothy McMurrich

The SCI-FUN Scottish Science Technology Roadshow

The University of Edinburgh, The King's Buildings, Mayfield Road, Edinburgh EH9 3JZ.

scifun@ed.ac.uk, www.scifun.ed.ac.uk

Editor: Peter Reid
Printed by: Lothian Print

