

# SAFETY

## Safe science teaching to children with special educational needs

*For some time, the Safeguards Committee has been considering safety issues surrounding teaching science to children with SEN. As explained in Peter Borrow's article in SSR (issue 296, March 2000), the great variety of special needs means that issues and their solutions are not always straightforward. What is clear is that all children deserve a good science education and that teachers and those who advise them have to find appropriate ways of working. Janet Bailey was one such teacher. She spent a term on secondment to an LEA EBD unit. This article is her case study account of some strategies which she found successful.*

I have returned to mainstream secondary school after spending a term seconded to the local authority Emotional and Behavioural Difficulties (EBD) unit. I normally teach science to 11 to 18 year-olds in a large comprehensive school. The EBD unit has two functions – referral for about two terms for the 'worse' cases of poor behaviour and a six-week package for children currently excluded. The age range covered key stages 2 and 3. As it was a small unit every teacher had to be expert in two or more aspects of the curriculum, so I got science, PSE and PE at key stage 3.

I had some reservations about the safety of teaching science in the unit because these children have a great potential for turning the most innocent of tasks into a fiasco. One of my great successes (as a chemist teaching a biology topic) was sprouting mung beans and getting the children to draw them as a daily record of the development of the plant. This worked well with 5 out of 6 members of the class – ignoring the fact that one child was so hungry that he was compelled to eat his still life specimen at the end of the task each day (I know – don't lecture me about the safety of that one – in the end I gave him beans and a jam jar to take home to grow his own). The sixth child

posed a problem because he was totally unwilling to co-operate and used his beans as missiles – not too high on the scale of danger, but spectacular in the disruptive effect on the rest of the group.

Seriously – it was a luxury to teach a group with a maximum of six pupils. We followed *Spotlight Science* books, using the topics most appropriate to each year group. I found that it was possible to attempt all of the practical work set out in the course, but the management of the practical sessions had to be closely examined for potential problems long before the children got anywhere near it.

When heating apparatus was used, it was essential that each child had their own set up and plenty of space to work in so they did not upset each other. Some of them lacked confidence in handling equipment and some had poor motor skills, so each having their own equipment helped to make sure that nobody could hide behind a partner and get away with not doing the experiment. If their attention was fully on the task, it was less likely that they would start to interact badly with each other. It was essential that I could control the gas supply to each work station from a cut-off point that only I could access. If a pupil began to play up or get into difficulty, I could remove the risk from the flame immediately.

Simple things like having apparatus to hand, but not on open display, was essential. If apparatus was out on the desk beforehand there was the potential for it to be fiddled with, broken or stolen. Chemicals had to be carefully labelled, but clear verbal identification was also needed as some children had limited literacy skills and were unable to recognise hazard symbols. It was necessary to think carefully exactly what to put on the labels, because some substances could be a target for theft. A large stock bottle labelled industrial alcohol attracted the attention of one streetwise 14 year-old. Making sure flames were extinguished when flammables were

used is another example of having to think things through to the 'nth' degree. If kettles could be used for supplying hot water, they were preferable to Bunsens and could be sited at a side bench out of harm's way until needed.

Some of these children, although brave and bold when sticking up for themselves with teachers and their peers, were extremely afraid of handling apparatus and doing their own experiments. Where support from a classroom support assistant was available I found that working as the child's partner was a useful way of building their confidence and instilling good practice.

It was necessary to modify some procedures to eliminate tasks that required a degree of manual dexterity. For example, in looking at photocells we used kits that required cells to be built into a cardboard structure. The children repeatedly failed to get their cell to stick in the frame. From then on, I decided that all construction-type tasks would need to be eliminated from my experiments. As there was no technician, I needed to turn to and do all my own building jobs.

All lessons were designed to be recorded on a pupil's worksheet. These followed a consistent standard of display, which was maintained in all subject areas in the unit. The children were rewarded by having their best work displayed. The worksheets included a variety of fairly trivial activities, to enable the least able to record something. Drawing equipment, colouring in, word searches, filling in pre-drawn results tables, cloze exercises, mnemonics were all included to give frequent changes of task. The topics were changed every half term and, with six noticeboards, this meant a year's work was on view at all time. This often helped with showing new pupils the required standard of work, as well as a revision tool when linking topics together.

**Janet Bailey**

Teachers both in mainstream schools, or schools and units which deal exclusively with pupils with SEN, frequently express to members of the Safeguards Committee concern about the risks that pupils with SEN may pose in science lessons. The most significant concerns are linked to children with unpredictable and often antisocial behaviour. There is no one simple answer. As Janet has pointed out above, these children should have access to science and often respond well to science activities. Among the strategies suggested in Peter Borrow's article are a trawl through the scheme of work to identify instances when the presence of an extra adult, perhaps a special needs support teacher, would enable practical work to take place. We have found that, particularly in mainstream schools, the allocation of SEN support assistants is often not flexible enough to accommodate occasional requests from science staff. We believe that pupils and teachers could benefit considerably if such an approach were considered. Other strategies include: temporary exclusion to another science lesson, essential where the risk assessment identifies too great a risk to the individual pupil, others around or the teacher; merging two classes and team teaching; or, as a last resort, abandoning the activity altogether. We would be delighted to publish further contributions about strategies teachers have found successful. Please contact Phil Bunyan, Chair of the ASE Safeguards Committee, via ASE Headquarters.

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# STOP PRESS

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Science Year has worked with the Teaching Awards Trust and BP to be able to offer a **Science Teaching Award in 2002**. This is prestigious, lucrative for the school and brilliant professional development for the individual concerned. But you won't win if you don't apply! And there are Regional winners as well as an overall national winner, so there is more than one chance to shine. Last year every Regional finalist (over 100 of them) received a top of the range laptop as part of the prize, and the Awards ceremony is televised by the BBC. So please think hard about getting nominated.

The application process is very simple: follow the links from the front page of [www.scienceyear.com](http://www.scienceyear.com) to the Teaching Awards site and you can fill in a web application form. The person who nominates you has to write 100 words saying why you are an innovative and special science teacher. It is really important that science teachers are given the recognition they deserve, and it is particularly important that this happens in Science Year. Anyone can nominate you: parent, pupil, colleague, head teacher, etc. And it is not terrible to ask someone. At the ceremony last year quite a few teachers had suggested that a colleague nominate them and the results were universally positive: the nominators felt it would have been presumptuous to ask but were delighted to be asked! So if no one offers and no one asks, there will be a gap where science should be. Do it today.

There is more in the way of prizes coming along. The **Young Science Writers Award for 2002** has been launched by the *Daily Telegraph* and BASF and asks for young science communicators to write a short article on anything that they choose about science, and the winners will fly to the US as guests of the *Daily Telegraph* as well as get their work published. Oh! I nearly forgot: there is a cash prize too and a subscription to *Nature* and the *New Scientist*.

There are two award categories: 16 – 19 year-olds and 20 – 28 year-olds, and there is a website dedicated to convincing you that you should write and enter. It is [www.science-writer.co.uk/home.html](http://www.science-writer.co.uk/home.html). If you are under 28 go for it.

Science Year is also pleased that **Tomorrow's World Live** is going to be back in 2002 but bigger and better as a touring show: It will hit Glasgow, Manchester, Birmingham Cardiff as well as London. And it is going to be the best hands-on science and technology show in the world and guess what! Schools get in free on the Wednesday, Thursday and Friday at each location and then Saturday is a family day. The whole event will be Science Year on the road and we hope hundreds of thousands of young people will participate. More details soon, about when it will be near you, and how you can book your free places.

So Science Year is hotting up: more activities, more resources for teachers, more competitions, more to do, more events and, we earnestly hope, more enthusiasm about science all round. We hope that you are beginning to feel a tiny bit special as science teachers.

More information in the next issue; or just sign up to the weekly electronic newsletter via [www.scienceyear.com](http://www.scienceyear.com) in the news section and get the information as it happens and delivered direct to your e-mail box.

**Nigel Paine, Director of Science Year**