TSNews

TSN Master Classes

Our one-day Master Classes are designed by Prof. Peter Brimblecombe to bring teams of teachers up to date in the latest research and understanding in science. Our first Master Class – on climatic change – was attended by 38 high school teachers, and was delivered in May at the UEA by leading scientists from the Climatic Research Unit and the School of Environmental Sciences. Teachers spent the morning discussing and hearing the latest scientific understanding on climate change, and used the afternoon for related 'hands-on' practical activity. The day was a great success with teachers asking for more classes in a number of other topics.

The second Master Class took place in September at UEA and looked at the science of waste management. However, this topic is also very popular with teachers and children at key stages 2 and 3, and so we increased the number of places available so that primary school teachers had the chance to attend as well. The extra funding needed for this Master Class came from the Norfolk District and County Councils. Once again teachers evaluated the day very positively and suggested other topics and ideas for other master classes.

The emerging features of our Master Classes that teachers seem to be appreciate most are:

- Funding for teachers' supply cover allowing *teams* of 2-4 teachers from each school to attend.
- A format that allows lectures in the morning by leading scientists or experts in the field, and hands-on related activity in the afternoon.
- A primary focus upon teachers' professional development in the subject for its own sake (rather than for its practical delivery in the classroom).
- A good, up-to-date text in the field given to each teacher to take away (ownership with the teacher, not the school).

The next Master Class is planned for May 1998 and will be on cosmology.

John Green at the School of Environment Studies, University of East Anglia, with teachers at the Climate Change Master Class.

Some teachers at the Waste Management Master Class chose to simulate ground water leaching (above)…

while others looked at ways of managing classroom waste (below).

Details about master classes may be found at http://www.uea.ac.uk/~e490/tsn/tsn.htm

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Questionnaire 1997

Most returns from the 1997 questionnaire sent to members are now in. Results so far:

Membership
Nearly 60% have been members for longer than 2 years, 90% of whom have kept the same partner.

Getting to know you…
A large majority of members (82% teachers, 68% scientists) considered that for success it is important to get to know their partner well. This suggests that a long-term link between a scientist and a school works better than one-off visits.

Projects; Who decides?
About half the partnerships jointly (i.e. teacher and scientist) decide upon the topics for in-school projects. Where only one partner makes this decision there is an even split between the teachers and scientists.

Projects; who develops?
Projects are developed jointly by partners 70% of the time, with the rest equally divided between teachers and scientists developing projects alone.

Who benefits?
Teachers thought both they and their children benefited equally, but they thought few scientists gained anything.

Scientists also thought teachers and children were the main beneficiaries, but they thought nearly as many scientists also gained. Only 3 (out of 73) thought that nobody had gained.

Other comments suggest that:
Scientists would like to be reassured that their employers recognise and support their TSN activity. They would also like access to a bank of tried and tested ideas that could be used in schools.
Teachers are anxious that any project work maps onto the existing curriculum, and emphasise that it is important for scientists to discuss ideas with them to help shape the activity.
Everyone thought that personal and regular contact is important, and that there are clear objectives both partners share.

Blue Orange Juice at IFR's Open Day.

Dave Hart
Institute of Food Research

During our recent Open Days we included the work of the TSN and how the IFR is involved. The exhibits explained what the TSN is, showing examples of projects done in schools partnered with IFR scientists. We gave a short presentation to a delegation of visiting senior council officials who showed great interest in what we have achieved in TSN.

The stand was manned by children from two schools linked with IFR scientists, and carried out their investigations for visitors to see. Pupils from St. Mary's Middle School (Long Stratton), showed visitors how to make a simple type of cheese, and then helped them eat it. Meanwhile children from Bawdeswell Primary School were really confusing people by giving them drinks where the expected colours and flavours did not match, and asking them to identify the flavour.

It was interesting to see how the children's confidence in speaking to the public grew throughout the day, turning from shy school kids into budding young scientists, explaining their work very eloquently. Kathy from Bawdeswell noted how much more seriously you are taken if you are wearing an official name badge (perhaps this could be the subject of our next investigation). During the day, the children were also able to visit other exhibits, and loads of fun was had by all involved. We would definitely like to do this again the next time we have an open day.

Making cheese. Kim Balls and Thomas Osbourne from St Mary's Middle School, Long Stratton: Jackie Brown, IFR (the school's linked scientist) keeps an eye on things.

The Mayor, Mayoress and High Sheriff of Norwich, with other senior council officers listen to Dave Hart explain TSN.

Wildlife on your Doorstep Competition

Following the *Secrets of Science and Survival* event last May a *Wildlife on Your Doorstep* competition was launched for key stage 2 and 3 children. The idea was to produce a visual account of an aspect of wildlife in or near school. Entries from across the county were all of a very high standard and varied in format: video tape, computer graphics, posters, paintings, models etc. Judging took place in the Survival Offices at Anglia TV, and all the entries then went on display at the JIC Conference Centre where children who took part in the competition came with their teachers to the awards presentation. Prof. Dick Flavell, Director of JIC and Martin Morall of ATV welcomed the children. Mike Linley, Survival Anglia, commented on each entry and the prizes and certificates were presented by Anglia TV Weatherman Jim Bacon—who sometimes diplays on his programme a mobile from Edinburgh Road School's entry. 10 year old Danielle Kelly finished off by giving a vote of thanks.

All children who entered received a certificate, and the two winning entries collected prizes of cameras, wildlife videos, CD roms and a trophy.

The winners were:

At key stage 2, **St Mary's Primary School, Beetley.** The children at Beetley found in the nearby woods an old boot and decided to look at the wildlife living in and around it. They produced a really first class presentation using photographs, drawing, graphs, accounts, diaries, audio tapes etc.

At key stage 3, **St. Andrews Special School, East Runton.** Children from this small special school looked at the wildlife found on their school field. They produced an excellent entry using a variety of media: photographs, maps, drawings and written account of the wildlife they found.

Wildlife on your Doorstep will be run again in 1999 when the next Survival event will take place.

KS2 Winners: St Mary's Primary School, Beetley

KS3 Winners: St Andrew's Special School, E. Runton

Annual Meeting 1997

Sharing information: display of partners' work done in schools

Genetics Day at Beccles

Peter Revill, John Innes Centre

Anne Millner, head of science at Sir John Lemen School, Beccles, said to me 'Do you think it would be possible to come in to school and talk to my students about genetic engineering?'. Within a month Anne had rearranged the school timetable and I was planning for a complete one-day practical on genetic engineering for the sixth form biology students. Maureen Bibb and Rekha Chakeraburtty from the John Innes Centre came along with me.

Our aim was to create a 'library' of Escherichia coli chromosomal DNA fragments, using recombinant DNA techniques with laboratory strains of E. coli grown the previous night.

After introducing ourselves, I followed with a bit on safety, and then spoke about what we were going to do: i.e. to create new bacteria by using genetic engineering, and have some fun doing it. Then we got stuck in.

First the students learned to handle micropipettors, and then the students worked from a very simple set of figures that I had drawn annotating them as they went along.

Loading an Agarose gel requires concentration and precision, yet the results from this stage showed that every group had successfully prepared their own plasmid DNA and, in the majority of cases, that it had been cut. At the end of the day, the agar plates were carefully labelled and then incubated. Two days later the 'recombinant' bacteria had grown and the experiment was complete. The students had learned about the processes involved and were going on to investigate more about genetic engineering.

We three had a great day and, judging from the comments and the thank you letters sent afterwards, I know the students had as well. One of my favourite bits was when Neil Sanderson, the head of the school biology department, came into the class at the end of the day and said that he had just stopped a student in the corridor and asked her what a 'restriction endonuclease' was; she told him.

Genetics Day at Alpington

Bob Cottell, Alpington Primary School

7 January 1997 was the day my scientist arrived! Peter Markham is a genetic engineer from the John Innes Centre. To maximise his visit I organised 'Genetics Day' for our two Junior classes. I spent time with Peter before the term started perfecting a battle plan.

Working with 60 children in the morning, I organised a sequence of practical fun activities, which picked up key vocabulary and concepts, and by putting them into communal use, allowed them to become familiar and acquire significance. Peter arrived later with a member of his research team and a car full of goodies. I led a short discussion with the children showing Peter what we had done, and then he took the children on from there. His presentation of over an hour held the children's interest throughout. The children then spent 35 minutes working with Peter's goodies. 'I was a bit sceptical about Bob's plans, ' Peter said 'but they worked really well.'

I think Primary phase teachers sometimes have an obsession with 'concrete experience' which may cause the 'big ideas' of Science to be disregarded, the 'big ideas' that children should know about. With skilful teaching, young children respond incredibly well to explanatory models and theories. What makes things worse is the 'Logical Empiricist' view of Science that is promoted to teachers, and it is often overlooked that science is as much a story of passionate belief and personal commitment as one of investigative technique. If we are trying to turn ON children to Science, then we have to teach something of its majesty, not just tinker with its method.

Lucy, Laura and Elizabeth from Alpington Primary School wore a paper 'virus' that used the children to copy itself and sweep through the school by the end of the day.

I am trying to organise a self-help group for primary teachers interested in teaching the big ideas of science. If you are interested please write to me, c/o Alpington School, Wheel Road, Alpington, Norwich, NR14 7PF (Email: r.cottell@netcom.co.uk).
