Roger Mitchell, Chair of the Association for Science Education's Primary Science Committee, tries to throw some light on what the strategy might mean for science education

The Primary National Strategy

I used to think that I kept myself quite well informed but I found out to the contrary when I was recently asked the question '*What exactly is the Primary National Strategy, and what does it mean for primary science?*' On the surface, this seems quite a straightforward question. My first thought was that, although I did not have the answer at my fingertips, it was the sort of question that should be easy to answer with a small amount of delving. However, things are not as straightforward as they might seem. Not being one to say no to a challenge, here we go…

Back in May 2003, the Secretary of State launched *Excellence and enjoyment: a strategy for primary schools*. This set out the vision for the future of primary education built on what has already been achieved. In the words of the DfES:

This vision is for a sector where high standards are obtained through a rich, varied and exciting curriculum which develops children in a range of ways.

The DfES sets out what it sees as the key to making this vision a reality on its website (see panel).

I am sure that some of this will ring bells with many teachers, although the only part that featured in the national press was about target setting and teacher assessment. From this document emerged the Primary National Strategy initiative that we have in England at the moment.

The problem is that the above brief is so wide ranging that it becomes difficult to provide a succinct definition of what the Primary National Strategy involves. For example, a major focus is to bring together the National Literacy and Numeracy Strategies into a single strategy for improving teaching and learning in primary schools, and achieve the national targets for English and mathematics for 2004 and 2006. One element of this process is a leadership focus aimed at assisting the sharing of good practice through, amongst other things, a mentoring system facilitated by groups of consultant head teachers. This is currently managed by Dr Kevan Collins, who was appointed as the Director of the Primary National Strategy, having been Deputy National Director of the National Literacy Strategy since 2000.

However, there are other elements that, although they fall under the Primary National Strategy umbrella, would best be described as linked projects as they are being managed separately and not under the direction of Dr Collins. An example of this would be the Modern Foreign Languages Pathfinder Project.

Making the vision a reality (from DfES website)

According to the DfES the key to making its vision for the future of primary education a reality lies in:

- Empowering primary schools to take control of their curriculum, and to be more innovative and to develop their own character.
- Schools setting their own targets for level 4 and 5 at key stage 2, based on challenging but realistic targets for the progress of each child in the school, with LEA targets being set afterwards.
- Trialling a new approach of supported teacher assessment at KS1, where tests underpin teacher assessment rather than being reported separately.
- Encouraging schools to network together and learning from others by sharing and developing good practice.
- Partnership with parents, which is vital in helping children to do as well as they can, and making wider links with the community.
- Government acting more and more as an enabler with schools increasingly in control of the support they get to:
  - strengthen leadership, particularly leadership of teaching, and professional development to help teachers embed the principles of effective teaching and learning both in literacy and numeracy and across the curriculum
  - help schools design broad and rich curricula which make the most of links between different areas and provide opportunities for children to have a wide range of learning experiences.

So where does this leave the development of primary science in relation to the Primary National Strategy? The most obvious link is in *'empowering primary schools to take control of their curriculum, and to be more innovative and to develop their own character'*. Unfortunately, because the curriculum focus is so heavily based on developing literacy and numeracy, it has yet to become clear how the aims of the Primary National Strategy will develop in relation to primary science. The ASE will seek an active role in this process of clarification. So, at present, I am unable to shed much light on what such support might look like. However, it is known that materials are being developed to promote the use of ICT to enhance the teaching and learning in all subjects. No doubt we will hear more about this initiative as science-related materials become more widely available to schools.

One thing that is certain is that the ethos of promoting innovative teaching and learning in science, and the sharing of such good practice, dovetails perfectly with the aims of the ASE. Consequently, regardless of the form that future developments may take, the ASE will be looking to engage in an active partnership with the Primary National Strategy so that we can continue to develop high-quality science learning experiences for all primary children.

Reference

DfES (2003) *Excellence and enjoyment: a strategy for primary schools*. London: Department for Education and Skills. Available from: www.standards.dfes.gov.uk/primary document

Creativity and the value of context in primary science

I read with great interest the articles and editorial on creativity and science education in *PSR* **81** (Jan/Feb 2004). I am a lecturer in chemistry at the University of Bristol, UK, where I am the schools liaison officer, and am also a parent governor of the infant school that my children attend. Over the last four years I have had the privilege of working with a number of primary schools in the Bristol area, encompassing a wide range of socio-economic catchment areas. I have given workshops, led science days and related activities and, most recently, run science weeks in two infant schools.

MAIL box

I have found the enthusiasm of the children overwhelming. Their creativity has also been fantastic, and I have been deeply impressed by their ability to explore 'outside the box'. Amongst undergraduates such daring is rare, and yet this is just the kind of creativity and lateral thinking that we lecturers long to see. Somehow this latent ability to explore without inhibition is lost or subdued along the way from primary to university, or maybe we at university are not nurturing this ability enough.

I have also found that these young children can grasp concepts and ideas seemingly beyond their years, when the science is put in a context to which they can relate – the familiar concept of 'situated cognition'. For example, in the most recent science week we used the book *The Lighthouse Keeper's Lunch* (Scholastic) as the focus of the week's activities. Years 1 and 2 had sessions on circuits, built lighthouses to house their circuits, and investigated pulleys, amongst other topics. In the book, Mrs Grinling sends Mr Grinling his lunch from their house on the mainland to the lighthouse via a pulley system. We put together a number of stations where pulley arrangements were either partially or completely set up and groups of five children worked their way through these individually, with helpers in attendance. The first few stations were designed to show, for example, that two wheels on a pulley allowed one to pull a heavier weight with the same applied force than a pulley with just one wheel – the concept of mechanical advantage. Other stations showed how more complicated arrangements of pulleys could be used to drag or lift objects, and finally a station was set up to mimic the arrangement in the book, so that a basket could be sent around a loop. Although the children would never use phrases such as 'mechanical advantage', nearly every child knew, either through exploration or by using logic before experimenting, that two wheels were better than one and allowed them to pull a much heavier weight, and they could see why. One said: '*You use more string but it is easier to pull*'.

Jurd's article 'Are the children thinking?' (*PSR* **82**, 12–14, March/April 2004) particularly struck a chord. Like Jurd I asked the children what they were thinking and what their predictions were for each investigation as they worked their way through the early stations. No response was rejected and ideas were discussed. Most children were able to discuss ideas in terms of everyday things, such as cranes, and all referred to the story that was the focus of science week. Where investigations produced a result opposite to their predictions they were able to provide good reasons why their assumption had been wrong. In the stations where children were encouraged to add pulleys as they wanted, the unbridled exploration led to some brilliant and inventive arrangements, which showed a real grasp of the principles and much creativity. A lot of time was allowed for these sessions and a high ratio of mentors to children (1:2 at worst) so that the children had time to explore and test out ideas.

Another surprise for me, though as I read the literature on primary science it should not have been, was that in general girls were more adept in terms of fine motor skills, e.g. threading the pulleys, and were more advanced in terms of their designs, creativity and level of understanding. It was clear that girls listened more attentively than boys and that certainly put them at an advantage in these year 1 and year 2 groups.

During the science week all school activities focused on it, so that literacy, numeracy and history were linked to the story. The holistic approach reinforced the science and my impression was that children and teachers alike enjoyed the week immensely. Once again, in a university context, we long for students to have a joined-up approach to science, that is, not to compartmentalise learning. My experience with primary children is that they are very capable of joined-up thinking and draw ideas from all their learning. They work especially well when the project is contextualised, relish the opportunity to play and explore, and thrive, as we all do, on encouragement and enthusiasm from the mentor. It has been an invaluable experience for me to return to primary science, and one that I will do on a regular basis. In the end, time is the essential ingredient. In most of my work with primary science I have the luxury of being able to work with small groups for 30–40 minutes at a time or longer, and there is usually a high ratio of 'staff' to learners. I am sure we all wish that such arrangements were commonplace in our primary schools.

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