

# Making 'hot science' cool

■ Bob Ponchaud ■ Anne Goldsworthy

'A scientist has said that he could imagine a time when science would be so good at treating disease that people could live forever. Do you think that's a good idea?' asks a Year 6 (age 11) teacher. 'No', says one member of the class, 'because the football teams would never change and I'd never get a chance to play football for Liverpool!' 'And there wouldn't be enough food to go round' adds another. 'I don't agree with that' says a third child. 'If we lived for ever, we wouldn't have to say goodbye to our families and friends and anyway we'd have enough food because we wouldn't need all the cemeteries so we could use the land to grow food.'

This is the sort of amusing but insightful discussion that took place in the classroom as part of the Cool Science project, funded by Astra-Zeneca. The project aimed to help teachers to use the online topical science Primary upd8 materials and active learning approaches. It also set out to see whether the use of these resources led to changes in children's ideas about what scientists do, and what science can do to help deal with issues in the modern world, such as climate change and food supply.

Twenty-eight primary and fifteen secondary schools took part in the project during 2006-07, working in four clusters. Teachers received training from project leaders, Bob Ponchaud and Anne Goldsworthy, in the use of upd8 materials with a particular emphasis on active learning. For example, children were given information about summer rainfall data, from the upd8 resource *Wet world* and, after discussion, showed whether they thought there was sufficient evidence for a trend towards wetter or drier summers, using 'thumbs up' 'sideways' or 'down'. When using another resource, *Drought cuts food supply*, they formed a 'human bar-chart' to show how the crop yield depended on rainfall. Teachers were also encouraged to use role-play in class, by themselves acting the part of celebrities and space travel agents as part of the *Celebrities in space* unit.

The training emphasised the importance of encouraging talk in the classroom. We suggested that key points to help teachers do this included:

- providing real issues or investigations to stimulate discussion and dialogue;
- encouraging mutual support with 'talk partners';
- being aware of their impact verbally by using non-judgemental comments, holding back 'correct' explanations and asking what the group has been discussing, not what individuals think; and

**1 Make a human vertical axis**

Type of ball	How high it bounced (cm)
Golf	49
Tennis	37
Squash	18

Scale

0	30
10	40
20	50

Put the label on one shoulder. Space out the numbers on the scale evenly up the side of the body.

**2 Make a human horizontal axis**

Type of ball	How high it bounced (cm)
Golf	49
Tennis	37
Squash	18

Four of you sit down in a line beside the vertical axis. You can represent the names and the label along the horizontal axis.

**3 Complete the bar chart with human columns**

Type of ball	How high it bounced (cm)
Golf	49
Tennis	37
Squash	18
Type of ball	

Three of you can represent the columns on the bar chart. Make the top of your heads come to the right height on the vertical axis.

- being aware of non-verbal impact by dropping eye contact, keeping reaction interested but impartial and avoiding 'hands up'.

The many different ways of actively using the upd8 materials were also discussed in the training. These included:

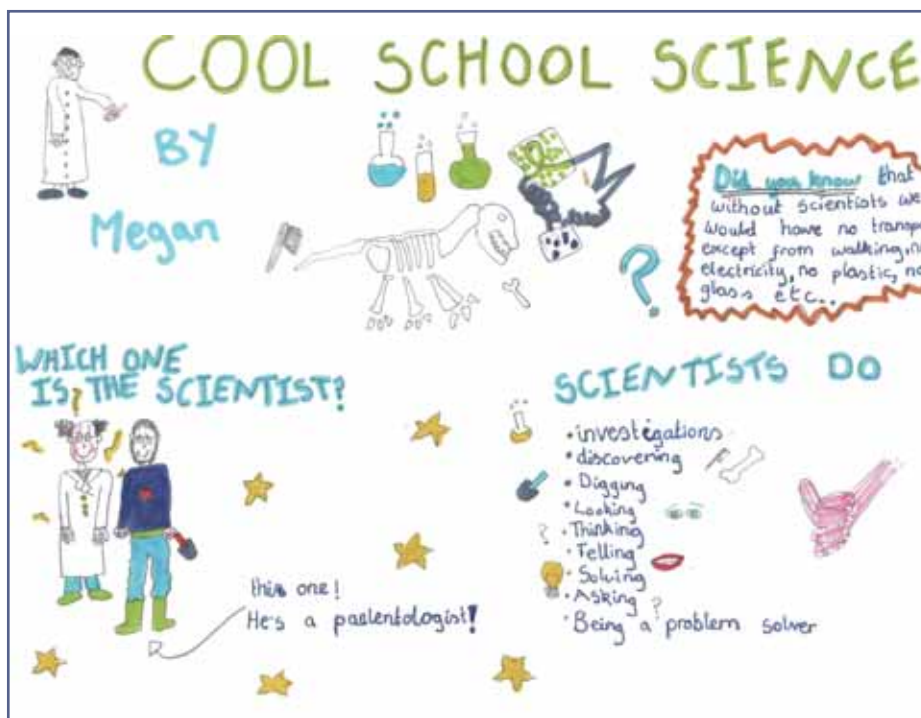
- linking them directly to the curriculum;
- using them in 'top-up time';
- using them to help with review and consolidation;
- taking advantage of the natural links with literacy, numeracy and other curriculum areas;
- for stand-alone topical science;
- as themes for assemblies or display;
- for informal assessment at the start of secondary topic; and
- use to support transfer between primary and secondary by encouraging common teaching approaches and themes.

Before using the activities in class, teachers used a short questionnaire with their children that presented statements such as: 'Scientists work in laboratories doing experiments' and asked them to respond on a four-point scale, ranging from 'Always' to 'Never'. Children were also asked to say whether they thought science could 'Help us with recycling' and other current issues with answers ranging from 'A lot' to 'Not at all'. After this questionnaire, teachers used selected upd8 materials for a term and then presented the same questionnaire again.

The teachers were also encouraged to introduce post-it 'blog boards' where children could record their ideas about 'What do scientists do?' and 'What can science do?' at any time during the project. This showed that their ideas really did change over time, as Bethany explains:

Before Cool Science: 'I thought that scientists made inventions or worked towards making amazing machines or gadgets that would change the world, just sitting in laboratories all day working hard. Before when I heard the word scientists, an image of a raving frizzy-haired lunatic came into my mind! I thought they mixed ingredients together to make fantastic substances without really any purpose.'

After Cool Science: 'Now I think scientists always have a purpose for whatever they are doing. Some scientists are inventors and mess around with things trying to invent and experiment but not many do that. To become a doctor you have



to do science and also to become a palaeontologist you have to do science and those are two entirely different jobs. Many jobs are only earned if you do science and many of these jobs are very exciting to do.'

The results showed that, after the active classroom use of the materials, children were:

- Less likely to think that scientists always or often work in laboratories;
- More likely to think that scientists use their experimental findings to show that particular things will happen in the future;
- Able to accept that scientists sometimes disagree about what they find out; and
- More likely to recognise that scientists could help us decide what to do to solve problems.

The children also showed increased awareness of how science can help with contemporary issues such as recycling, climate change, disease and food supply.

Teachers and children enjoyed and benefited from Cool Science activities and approaches. As well as apparently changing children's ideas about science, things changed in the classroom as well:

'It changed the way we taught science. We are moving to a thematic curriculum and Cool Science fitted in really well. We used it to make links with other subjects. Some staff have used the units in other lessons, such as literacy.'

'The children loved the activities. They knew what to expect when Cool Science was on the agenda. When I said we were about

to do one, there was always a gasp of anticipation. The children enjoyed them because there was more discussion and they had much more ownership of the lessons.'

If you would like to find out more about the upd8 resources and how you can turn 'hot news' into 'cool science', please go to: <http://www.primaryupd8.org.uk/>. Here you can see what is available and try some free sample resources. If you like what you see, and we are sure you will, why not register for full access and online updates of upd8? Maybe you will want to carry out your own investigation into the impact of the materials. Whatever you decide, enjoy making science cool!

ASE members can now subscribe to Primary upd8 for £30.00 + VAT (instead of the standard £120.00 + VAT). To take advantage of this super offer, see 'Special Offers' on [www.primaryupd8.org.uk](http://www.primaryupd8.org.uk) or contact [primaryupd8@ase.org.uk](mailto:primaryupd8@ase.org.uk)

Primary upd8 is developed and managed by ASE in partnership with the Centre for Science Education, Sheffield Hallam University.

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