ASE–Wellcome Trust

citizenship and science project

Peter Campbell

In a single century, extraordinary successes of science and technology have enabled people to change the world. And this changed world has come to rely upon a significantly increased proportion of the population working in science-related employment, some 60 million. As readers will almost certainly know, citizenship education becomes part of the statutory National Curriculum from September 2002. Science-related issues play such an important part in contemporary life that citizenship education must surely include them.

Collaboration

The ASE has a long and honourable history of supporting the teaching of science in its social context, including major projects such as SATIS, which was adapted for several age groups. Projects such as SATIS were created by teacher members, and arose from innovative approaches developed in their own classrooms. Likewise, the Wellcome Trust is widely respected for engaging young people in discussion about the impact of science on society, particularly in areas related to bio-medical ethics. Certainly biology teachers will know of practical activities that the Trust has organised for students and be familiar with publications such as *LabNotes* and science issues theatre. Recently the Trust has supported research work, based at the Institute of Education, exploring the teaching of socio-scientific issues, its outcomes published under the title *Valuable Lessons*. Early in 2001, the two organisations agreed to collaborate in developing stimulating approaches to teaching citizenship through science at key stage 3. The ASE then won a contract to draft two Units, which were posted on the DfES website during January 2002, as part of its schemes of work for citizenship.

I had arranged to start in September teaching physics three days a week at William Morris Academy, the sixth form for five comprehensive schools in Hammersmith & Fulham. When I learned about this ASE-Wellcome collaboration late in July, it seemed to offer a contrasting challenge for the rest of my week. I jumped at the chance to manage the project.

By late August, when I started work, a Steering Committee meeting had already endorsed outline themes for two Units. Both were to focus on contemporary concerns generally regarded as important, with no excuse for pupil boredom. That Committee had also decided that the Units should be written so as to be equally useful to science teachers and non-science teachers, for example form tutors in PSHE lessons. This required careful thinking, to emphasise citizenship concepts and discussion processes rather than more familiar instructional approaches common in science teaching. We also had to learn to work within the constraints of QCA Unit styles and try to design flexible Units that would stand the test of time while also being useful for September 2002.

Two citizenship Units

The interaction between people and the environment, and the ways this differs both geographically and historically, has for some time been a major subject for scientific investigation. In this century, with enormous technical power at the disposal of a huge and still growing human population, it is vital that young people come to understand issues affecting our 'environmental footprint'. So the first Unit became ***People and the environment***, a template for considering how individual choices and behaviours collectively impact on the environment, at all geographical scales. This Unit aims to help pupils consider value judgements, evaluate evidence, perhaps to consider risks.

The benefits to humanity of both science and also the technologies that science makes possible are recognised. At the same time science provokes enormous challenges and in some cases perceived threats. The daily news is full of just such instances. How can we ensure that science works for people and with people? The 'public' is not homogenous and typically there will be competing interests. Public policy decisions are sometimes made in the absence of scientific certainty. Thoughts such as these underlie the second Unit, ***What's in the public interest?***, a template for considering any current and controversial science-related issue. This Unit explores conflicts inherent in points of view, issues that cannot be resolved simply by recourse to evidence or experiment, and different perceptions of public policy. It can be extended to introduce and apply a variety of moral principles.

We consulted with experienced science teachers, citizenship teachers and others, and incorporated many helpful suggestions, before these two Units were finally handed over to the QCA in mid-November. By that time, we were more than a month into the process of writing exemplary classroom resources, something most teachers will find more immediately useful than generic Units.

Classroom resources

When I started work, the classroom resources had already been scheduled for publication on the third of the ASE's five Science Year CD-ROMs,

appropriately titled *Can we? should we?*. With the CD due to be despatched next month (March), the opportunity for trialling was limited to a short 'window' during December and early January. Fortunately, more than a dozen teachers, from different school types and locations, responded to a call for volunteers in the September issue of *Education in Science*. Immunisation has been used an example topic for the Unit *What's in the public interest?* Two topics provide examples for *People and the environment:* energy resources and food production.

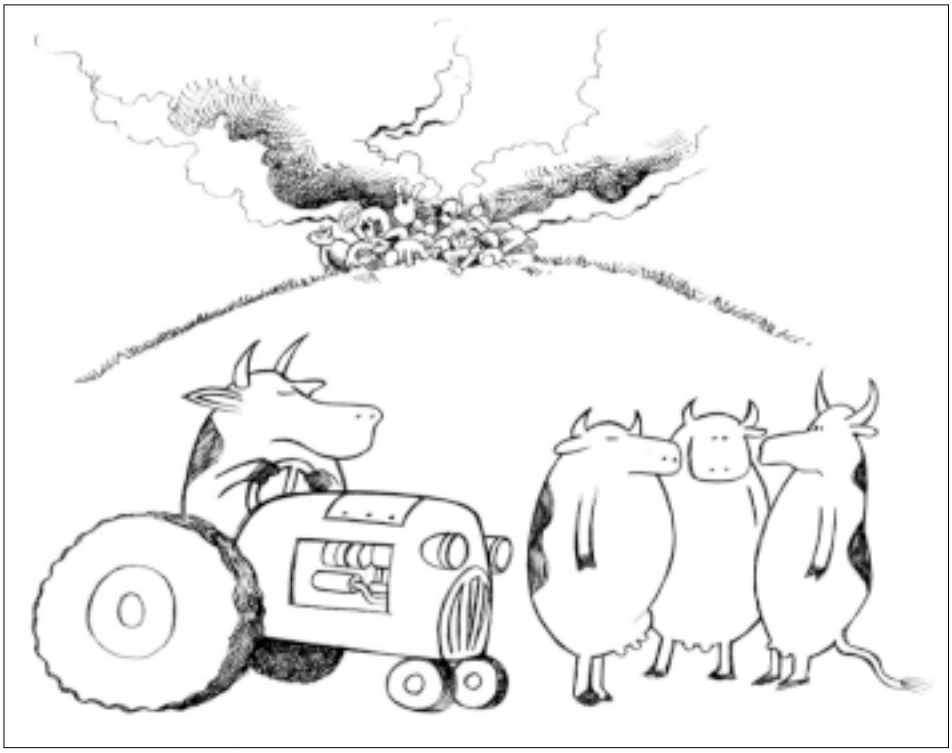
Our aim was to generate new materials that would add to already-existing resources in a useful way. The twin goals were activities that pupils would find stimulating and ease of use for the busy teacher. Discussion is central to both Units. This means teachers need to avoid the role of scientific 'expert' and instead maintain procedural authority, structuring pupil discussion and research. A successful citizenship lesson is one that leads not to classroom consensus but to thorough exploration of an issue, protecting diverse pupil views.

Joan Solomon has written several important guidance notes for teachers: a short introduction to citizenship in the context of science, 'how to teach / help pupils to discuss social issues' and 'how to design and run a role play'. Ralph Edney, in his inimitable way, has produced two uncaptioned cartoon drawings for each of the three topics, intended as discussion starters. Experienced writers Stephen Webster and Andy Merriman were commissioned to write short dramas, to be performed by pupils, also as discussion starters. Mary Ratcliffe, Jenifer Burden and I have created a variety of structured activities for pupils, together with glossaries for pupils, containing both citizenship key words and science key words. Marianne Talbot has written a pupil exercise around moral principles, while Ian Lawrence has written modelling software to allow pupils to explore factors affecting the spread of any infectious disease. Dave Pickersgill has written a piece about using the Internet for pupil research. David Sang helped with the editing of all of these. For illustrations we have drawn on a large bank of SATIS publications. It's been a privilege to work with such a talented team.

A national conference

As a next step, a one-day Conference has been organised for 28th February. It will bring together about 200 people, from a range of institutions, who share a common interest – improving participation in public debates related to science. There will be three keynote speakers, all prominent public figures: a scientist (Sir Joseph Rotblat) concerned with the social responsibility of science, a non-scientist (Helena Kennedy) involved with the impact of science on society, and a science journalist (Tim Radford).

There are countless examples of good practice in citizenship education to draw on; we have asked a few teachers of science and of citizenship to describe their experiences.



The cartoons on the CD are drawn to be open to many interpretations, to stimulate thinking.

Made into a transparency for an overhead projector, this drawing could be used to stimulate class discussion. 'What does the picture show? Can you remember seeing images of pyres of animals on the news? What was going on in the countryside during the year 2001?' Or pupils could be asked to write a caption, after doing a little research. 'Draw speech bubbles. What might the cows be saying about foot and mouth disease?'

Delegates will be set a number of group tasks not unlike group activities appropriate to a key stage 3 classroom.

A publication arising from the conference will be distributed free to all schools in England and Wales, spreading the main messages of the conference but also providing teachers with a few more photocopiable resources.

What's ahead

If there is sufficient demand, during the summer term I will be working with ASE INSET Services, training teachers to use approaches we have developed. The aim of the project as a whole is to provoke fruitful discussion among colleagues, to contribute new resources and to inspire a successful launch for the teaching of citizenship through science.

Before I know what's happened, a year will have swept by and this project will have run its course. In schools and classrooms around the country, however, development work will continue. At key stage 4, the DfES has no plans for subject-related citizenship Units, so the ASE will have a different role to play.

Research evidence shows that what happens in science classrooms during key stage 3 is crucial to post-16 subject choices. I hope you will make the most of the opportunity which citizenship education represents, to liven up some science lessons and engage your pupils. If you think you have something to offer other teachers, please get in touch with me through ASE Headquarters or by e-mail at: petercampbell@ase.org.uk