

In the last year, the ASE with NASEN (the National Association for Special Educational Needs) have bought together teachers, organisations, advisers and other interested individuals to consider what is needed to support inclusion in science effectively (see *EiS* April 2002). Having established a strong base through the Inclusive Science and Special Educational Needs (ISSEN) website at www.issen.org.uk and e-mail group, the project has progressed on to develop and collate resources. Using support from the DfES SEN small grants programme, we are producing a CD-ROM featuring these resources. The material, some bespoke and some existing, is intended to support mainstream and special school teaching and will also be made available through the ISSEN website. The resources will be supported by teachers' notes that explain how they contribute to inclusion.

Inclusive Resources for

Science and Special Educational Needs

Adrian Fenton



Fun ideas with plants – pollinating flowers using a finger puppet.

What makes a good resource for students with special needs?

Effective materials will use different approaches to enable learners to develop their own understanding. Activities should take account of:

- visual learners (interpreting diagrams, observing interactive animations);
- auditory learners (discussing ideas, sounding vocabulary and utilising word games); and

- kinaesthetic learners (model making or feeling and handling objects).

A good resource will provide opportunities in these areas (with the appropriate use of language), so that teachers can decide the most effective way to work with their own students. However, it is important keep in mind that inclusion is frequently about adaptation of material and teaching strategies, rather than starting afresh.

Highlights from the resources

The CD brings together a range of full-scale investigations, lesson enhancing resources and practical advice for managing special needs in the science department. Materials utilising ICT to support activities is integrated throughout. The materials are targeted at students between 10 and 14 years-old (although it is recognised that within some areas of special need, it is better to consider an individual's ability rather than their age).

Coastline Protection uses the theme of an eroding coastline and its effects on the local community to engage students in this investigation. By making models, examining photographs and using role-play, students are led to investigate the best quantities to mix for making concrete blocks for a protective sea wall. This resource comes from the work of Jill Bancroft, who has developed numerous inclusive science resources at the Chemical Industry Education Centre (CIEC) in York.

Microscale Chemistry uses clear plastic sheets, placed on top of worksheets, on which the reactions take place. This style of experiment can be used in a wide variety of environments with minimal equipment requirements. There is also a strong correlation between the results table viewed on the worksheet and the layout of the experiment that takes place on the plastic (thus eliminating problems in transferring what is seen in the test tubes on to the results table). These materials were developed by the Royal Society of Chemistry.

Torches and Colour brings together a number of interactive simulations for the combination of torch colours and the appearance of different colours through filters. Such interactive activities could be used to clarify the key learning objectives following up practical experiments with light. At a different level, the torch combination resource could be used to develop hand-eye co-ordination, whilst familiarising the students with the names of primary and secondary colours (since it incorporates speech synthesis). This feature is based on materials from Simon Evans (see the website at www.senteacher.org) and Sandy Wilkinson (who works on the

Great Barr School website at www.greatbarr.bham.sch.uk/). Other interactive features and demonstration ideas are also included.

Fast Plants provides fun ideas to enable students to be involved with growing rapidly cycling brassicas. These plants go through a complete life cycle in five weeks (using a light bank to support their growth), so the results can illustrate the plants' stages in development. Support for using these plants in schools came from the Science and Plants for Schools (SAPS) project based in Cambridge and the activity suggestions came from Sue Stalley of Alexandra School, Harrow. The photograph shows a bee finger puppet being used for pollinating flowers.

Flashcards software enables word lists to be written and the vocabulary is flashed on a computer (or digital projector) screen in a random order. This simple idea has numerous applications such as 'describe the word' quizzes, 'solid, liquid or gas?' or bingo-style activities. The application could also be used in other areas of the curriculum, since a user can create their own word list. This resource idea originated from Simon Hensby's special needs website (www.adders.org). Other wordbanks and language games are incorporated on the CD-ROM.

SEN in the Science Department is another feature on the CD. With new strategies, documentation and a greater emphasis on catering for all students, a teacher may not know where best to start. This section of the resources will help science teachers gain a better understanding of special needs. One resource will have science-specific suggestions, covering the following areas:

- communication and interaction;
- behaviour, emotional and social development;
- sensory and/or physical needs; and
- cognition and learning.

The content originated from science teachers experienced in the different areas of special needs and was produced in line with the *SEN Code of Practice* (DfES, 2001). Each section will have links to further information or resources, creating a useful starting point.

Sharing good practice

There will be a session at the Annual Meeting in Birmingham on Saturday, 4th January to demonstrate the resources and discuss the outcomes of the ISSEN project. A similar session will take place at the ASE Brentwood Science Conference on 25th January 2003. These presentations provide great opportunities to meet with others who share an interest in this area. For special schools, these sessions may complement the training within the Key Stage 3 Strategy.

We were pleased to have a session at the annual Special Needs London event, organised jointly by NASEN, the Publishers' Association and the Educational Publishers' Council, where the importance for developing subject-specific materials was recognised.

A special edition of NASEN's journal *Support for Learning*, focusing on Science and Inclusion, has recently been published as a direct outcome from the ISSEN project (and complementing the Social Inclusion edition of *School Science Review* in June). This collaborative edition is to be made available to ASE members for a special price of £5. For further information e-mail adrianfenton@ase.org.uk.

Distribution of the CD-ROM

The CD-ROM will be sent out to mainstream secondary schools in December and will be available to special schools through Key Stage 3 Strategy training. The Science Enhancement Programme (SEP) is supporting the reproduction and distribution of the resources. The November issue of the SEP magazine (which is circulated to all schools) will also have a feature on the CD-ROM. The SEP (www.sep.org.uk/) is one of the Gatsby Technical Education Projects.

Contact

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Reference

DfES (2001) *Special Educational Needs Code of Practice* 581/2001. For information see the website at www.dfes.gov.uk.

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