SSR

September 2021
volume 103 number 382

The Association for Science Education

School Science Review

The ASE's journal for science education 11–19

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School Science Review

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School Science Review is published in March, June, September and December as a benefit of 11–19 membership of the Association for Science Education. It is also available on subscription from the ASE.

ISSN 0036–6811

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Printing Holbrooks Printers Ltd, Portsmouth, England

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Health & Safety

For all practical procedures described in *SSR*, we have attempted to ensure that:
- the requirements of UK health & safety law are observed;
- all recognised hazards have been identified;
- appropriate precautions are suggested;
- where possible procedures are in accordance with commonly adopted model risk assessments;
- if a special risk assessment is likely to be necessary, this is highlighted.

However, errors and omissions can be made, and employers may have adopted different standards. Therefore, before any practical activity, teachers and technicians should always check their employer's risk assessment. Any local rules issued by their employer must be obeyed, whatever is recommended in *SSR*.

Unless the context dictates otherwise it is assumed that:
- practical work is conducted in a properly equipped laboratory;
- any mains-operated and other equipment is properly maintained;
- any fume cupboard operates at least to the standard of CLEAPSS Guide G9;
- care is taken with normal laboratory operations such as heating substances or handling heavy objects;
- good laboratory practice is observed when chemicals or living organisms are handled;
- eye protection is worn whenever there is any recognised risk to the eyes;
- fieldwork takes account of any guidelines issued by the employer;
- pupils are taught safe techniques for such activities as heating chemicals or smelling them, and for handling microorganisms.

Readers requiring further guidance are referred to:
Safeguards in the School Laboratory, 12th edn, ASE, 2020.
Be Safe! Health and Safety in School Science and Technology for Teachers of 3- to 12-year-olds, 4th edn, ASE, 2011.
Topics in Safety, ASE, latest version on the ASE website: www.ase.org.uk/resources/topics-in-safety (login required).
Hazcards, CLEAPSS, latest version, and other relevant publications, on the CLEAPSS website: www.cleapss.org.uk (almost all schools, colleges and teacher training establishments in the UK outside Scotland are members, as are many overseas).
Hazardous chemicals database, SSERC, latest version on the SSERC website: www.sserc.org.uk/health-safety/chemistry-health-safety/hazchem_database-2/ (schools, colleges and teacher training establishments in Scotland).
Preparing Risk Assessments for Chemistry Project Work in Schools & Colleges, SSERC, 2020.

Editorial Board and Associates

Contributing to *SSR*

We welcome contributions for all sections of *School Science Review*. For reference, a full page of A4 text in the journal is about 800–850 words; including two small figures on a page would bring that down to about 600 words. Articles should be no longer than 4000 words in total.

These can be emailed to The Editor, ssreditor@ase.org.uk, or posted to The Editor, *School Science Review*, ASE, College Lane, Hatfield, Herts AL10 9AA. Detailed advice on the submission of articles and Science notes is available on the ASE website at: www.ase.org.uk/submission-guidelines.

Editorial

As the new school year is starting with a full return to the classroom, and with only a few restrictions advised rather than enforced, this edition does not have any content referring to COVID-19. Photographs in articles showing children in close proximity and without masks were all taken before the pandemic started.

The debate in the UK about fairness of using assessments rather than examinations will probably rumble on, although the media gives the impression that grading has been lenient in comparison with the achievements in earlier years. A consequence was stories about more students being qualified than there were places available in higher education. There were also a few complaints about plans to continue remote teaching in some places, but that seems to have gone quiet.

I am pleased to see that several articles in this edition involve practical work. Something I have noticed over the years is that we receive fewer articles about practical work. I have recently had cause to look through some editions of *SSR* from about 50 years ago. Ideas for class practical work and demonstrations in all three major sciences were dominant at that time. Teachers were thinking independently to foster understanding.

The opening article shows a collaboration between primary and secondary schools in Berkshire studying wildlife, which involved plenty of outside activity. It had external support from Oxford University, and equipment to help them study nightlife was available.

Keith Ross, a frequent contributor now living in France, describes a model to study the fuel–oxygen system. From Japan, Tetsuo Nakagawa provides a well-illustrated description of the production of 'home-made' apparatus for use in microscale chemistry experiments, using scrap materials. Andy Markwick illustrates a variety of ways in which students can be engaged with microscopy at low cost. Selections from all the sciences are illustrated.

From New Zealand, Simon Taylor (a keen surfer himself) describes the properties of waves and explains that understanding their production can lead to more successful surfing. The ideas can help to reinforce knowledge about wave effects applicable to the electromagnetic spectrum. It might come as a surprise to students that news broadcasts by radio began only 100 years ago, while television broadcasts came only 70 years ago.

James de Winter, a member of our Editorial Board, and Alan Denton have produced an interesting account of using the bicycle as an engaging context for teaching about forces and other physics concepts. I know from experience that students in schools often claim to find physics difficult. There will be students who could be motivated to work to achieve an improved understanding and develop their skills in physics when considering topics like this, which can be observed outside school.

Graeme Rough and colleagues outline the highly successful Young STEM Leader Programme in Scotland, which is developing peer role models across primary and secondary schools.

Also from Scotland, Carl Schaschke offers a description of the working of a violin and similar instruments. Again, we see how physics is relevant outside the school laboratory. Then, from Wales, Anthony Clowser describes a project investigating meteorite impacts, making good use of simulations.

Simon Rees and Douglas Newton put forward an argument for creativity being at the heart of science, using the examples of Michael Faraday's career and the development of the periodic table.

Daniel Lyng describes the process of meta-learning – learning to understand one's own learning process. This approach could lead to improvements in the public understanding of science, and help students recognise the relevance of school science now and in the future.

An important article from John Leach reflects on a research review by Ofsted focused on science education, which has many implications for practice. However, he fears there will be tensions in implementing them.

In an article from Switzerland, four authors have collaborated to explain how much science can be learnt from observing a burning candle, an item many of us keep at home because they will be useful if there is a failure in the electricity supply. They explain the different ways Faraday had used this simple object to illustrate scientific phenomena in his Christmas lectures for several days. It was the last Christmas lecture given by him, but as two articles in the edition show, Faraday had a major influence on science that still needs to be taught in schools even though the lecture was 160 years ago.

A noticeable feature of this edition is how diverse our content can be, both in terms of the varied topics and geographically, with contributions from three of the home nations and others from distant places in the world. Although ASE might be considered a small organisation, people from around the world seem to appreciate what we do.

Geoff Auty
Editor, *School Science Review*