Contents

SSR in Practice

November 2024, 106(392)

The ASE's peer-reviewed journal for 11–19 science education

ASSOCIATION FOR SCIENCE EDUCATION

Content Editor **Fiona Williams**
Commissioning Editor **Helen Harden**
Executive Editors **Martin Payne** and **Helen Johnson**
Editorial contact ASE **Will Hoole**
Typesetting **Karen Dyer**

Acknowledgements

Authors (see Contents list on page 1)

Reviewers: Maria Bateson (The Charter School, East Dulwich); Simon Carson (University of York); Stuart Farmer (IOP Scotland, Fife); Jon Hale (Beaulieu Convent School, Jersey); Joanna Haywood (University of Cambridge); Andy Markwick (Researcher at UCL, London); Colin McGill (Edinburgh Napier University); Deepika Narula (St. Albans School, Herts); Colin Oates (Teacher of Physics, Fife); Jamie Pout (Dover Grammar School for Boys); Keith Ross (Former teaching fellow at University of Gloucestershire); Sarah Sephton (St. Clement Dane's School, Chorleywood); Dom Shibli (University of Hertfordshire); Shaista Shirazi (University of Glasgow); Laura Smith (Priestley College, Warrington); Holly Williams (Fulford School, York); Janet Williams (Mayflower High School, Billericay); Ralph Whitcher, Peter Borrows and John Tranter (ASE Health & Safety Group).

Special thanks for this issue go to: Jon Hale for mentoring and support for one of the articles and members of the ASE Health & Safety Group for their continued support with this practitioner-focused journal.

Contributing to *SSR in Practice*

If you have an idea for an article for *SSR in Practice*, please submit your idea using the form: https://forms.gle/wcgWj1267Bi6RN7x Writing guidance is available to support authors with the writing process. See www.ase.org.uk/submission-guidelines

SSR in Practice and *SSR in Depth* are published in November, March and July as an add-on benefit of membership of the Association for Science Education. We also offer journal subscriptions for institutional access to universities and libraries – find out more at www.ase.org.uk/libraries. The contents of this journal do not necessarily represent the views or policies of the ASE, except where explicitly identified as such.

Editorial Board

Contact

The Association for Science Education
483 Green Lanes, London, N13 4BS
T: 01707 283000
www.ase.org.uk ✉ info@ase.org.uk 𝕏 @theASE
Advertising: www.ase.org.uk/advertising

Printing: Holbrooks Printers Ltd, Portsmouth, England

ISSN 2755-2551

Cover photo: Peter Hermes Furian/ Shutterstock

Health & Safety

For all practical procedures described in *SSR in Practice*, 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 in Practice*. 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 or smelling chemicals, and for handling microorganisms.

For further guidance, please see page 3 of *SSR in Depth*.

Copyright

Editorial

Fiona Williams, *SSR* Content Editor

Welcome to the November issue of *SSR*.

With the Government in England carrying out a Curriculum and Assessment Review, the theme of curriculum is very topical. In this issue of *SSR in Practice*, Colin McGill, Heather Earnshaw, Eric Easton and Kirstie Carvalho explore what we should teach and why. This research-informed article is specifically about the curriculum in Scotland, and particularly the secondary Broad General Education sciences curriculum, but is relevant to everyone. It suggests the pedagogy that could be used to teach the curriculum, with a particular focus on explicit instruction along with the reasoning behind this. Continuing with the theme of curriculum, Emma Swift and Natalie Johnston share their approach to designing a trust-wide science curriculum for a diverse range of school types.

In *SSR in Depth*, Mark Whalley explores the reasons why physics teachers have left the profession. Mark shares the reasons that the ex-physics teachers in his study gave for leaving the classroom. This article follows on from one in the previous issue in which Mark and Ian Horsewell shared their study of the experiences of physics teachers in England in the first five years of their teaching careers.

In two companion articles, Simon Colebrook and Zoë Thorn share insights into how they have designed their scheme of work for A-level chemistry. They focus on how this has been useful to help in tackling common student misconceptions in the topic of bonding and structure. They also look at 'scale' as a threshold concept, and report that some misconceptions around structure and bonding have been corrected by improving pupil knowledge and understanding of scale.

If you are looking for things to try out in the classroom, there is a range of articles that might interest you in this issue. In *SSR in Practice,* Jon Hale outlines a practical approach using teabags to investigate decay and decomposition. Chis Graham offers some suggestions for using plant materials to help students to become more confident and enthusiastic when using microscopes. Meanwhile, technician Denise Ralph shares a practical idea to encourage the use of mini-scale food tests. In *SSR in Depth*, Ran Peleg, Carys Hughes and Marcus Grace explore how escape room activities can be used to support outdoor science activities; and Stephen Rowcliffe shares an idea for a practical demonstration that uses simple equipment to simulate the X-ray diffraction technique used by Rosalind Franklin in the discovery of the helical structure of DNA.

Image by Alexander Antropov from Pixabay

Fiona Williams

For further articles you can access *SSR in Depth* online at www.ase.org.uk/SSR-in-depth/issue-392