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# SSR in Depth

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# SSR in Depth

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

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We welcome contributions for all sections of *SSR in Depth*. 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, including references.

Authors wishing to submit an article to *SSR in Depth* should visit [www.ase.org.uk/SSR-submission-guidelines](http://www.ase.org.uk/SSR-submission-guidelines) and click the 'Submit Your Article' button in the SSR in Depth section. Alternatively, for assistance with your article or idea for an article, please contact [ssreditor@ase.org.uk](mailto:ssreditor@ase.org.uk)

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# Health & Safety

For all practical procedures described in *SSR in Depth*, 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 Depth*.

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;
- eye protection is worn whenever there is any recognised risk to the eyes;
- good laboratory practice is observed when chemicals or living organisms are handled;
- 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](http://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](http://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/](http://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

Fiona Williams, SSR Content Editor

Welcome to the March issue of *SSR*, with its interesting range of articles covering many different areas. In particular, there are articles that provide insights into different cultures, teaching approaches and curricula. In *SSR in Practice*, Simon Taylor shares research into the use of dioramas as an approach to teaching sustainability to pupils in New Zealand. In *SSR in Depth*, Syakti Sriyansyah gives some insights into Indonesian culture and how he has used musical instruments and a free mobile phone app to take measurements and calculate the speed of sound with the students in his class. Ken Rotheram discusses curriculum reform and provides a brief overview of curricula in a variety of countries.

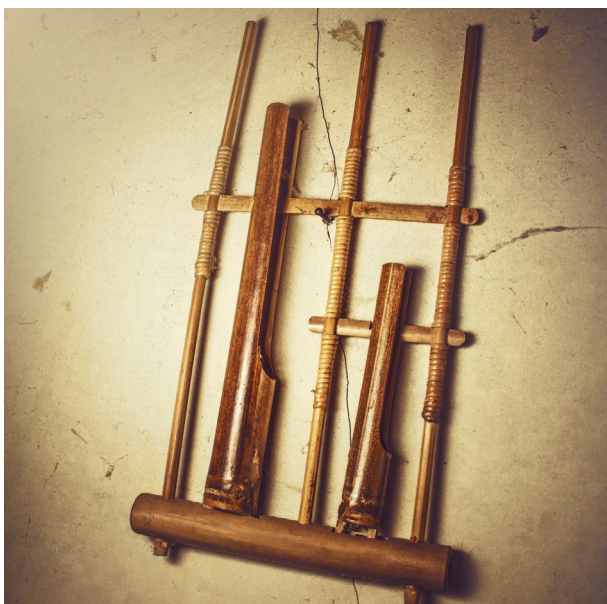


Image of Indonesian angklung by Rianda Hardi from Pixabay

The Language of Science is one of the seven areas identified in the EEF report 'Improving Secondary Science'. In his article in *SSR in Practice*, James Williams shares his insights into demystifying scientific language for students. This links back to his article 'Scientific language: how important should it be to teachers of science?', which was featured in the November issue of *SSR in Depth*. In addition to scientific literacy, maths skills in science also features in this issue with Amanda Clegg's and Karen Collins' article about graph interpretation skills.

Teacher education is a vast area ranging from initial teacher education through to CPD for experienced teachers. This issue has a variety of articles to span these areas. In *SSR in Depth*, Ade Magaji discusses the promotion of constructivist teaching strategies with trainee science teachers with a view to promoting learning. In *SSR in Practice*, Michael Greener shares some points from his ITE project in which he explored the use of metacognitive questioning. His article provides some food for thought for both new and experienced teachers. In addition, Brotati Veraitch shares some learning from a CPD course on using structure strips to help with answering 6-mark questions. This is often an area that students struggle with at GCSE. The article shows how Brotati implemented what she had learnt from the course and from other reading to improve the attainment of pupils in this type of question. Cognitive load and dual coding are prominent topics in education at present. On this theme, Penny Robotham discusses the use of diagrams in teaching and how she has been prompted to think about how these are used following her research with John Oversby and the PALAVA teacher action research group.

Following her article on hinterland electrochemistry in the November issue of *SSR in Practice*, Jennifer Marchant writes about isolating metals and shares some ways on how to use the ideas in various teaching scenarios. In *SSR in Depth*, Frank Harris discusses how various physics principles can be exemplified through thinking and braking times when driving.

Student book reviews feature again in this issue of *SSR in Practice*. Please take the opportunity to share these with your students. On page 31 you will find information on how your students can take part if they so wish.

Finally, Helen Harden, commissioning editor, puts out a call for people to take part in peer-reviewing of articles. Please read 'Get involved' on page 32 of *SSR in Practice* and get in touch if this is something you would like to consider.

Fiona Williams

Read more in *SSR in Practice*

*SSR in Practice* is available at: [www.ase.org.uk/ssr-in-practice/issue-390](http://www.ase.org.uk/ssr-in-practice/issue-390)

