



ASE Annual Conference 2019

FSC A level biology fieldwork



www.field-studies-council.org/alevelbiology

Up to **5** named practicals ticked off*

All **5** practical endorsement criteria assessed

3 stats tests taught

3 different ecosystems studied

36 hours of teaching

Just **5** days off the school timetable

FSC

School Science Review

The ASE's journal for science education 11–19

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Health & Safety

For all practical procedures described in *SSR*, we have attempted to ensure that:

- 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 should always check their employer's 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:

Hazcards (CLEAPSS, 2016 and updates)

Topics in Safety, 3rd edn (ASE, 2001; updates available at www.ase.org.uk/resources/topics-in-safety)

Safeguards in the School Laboratory, 11th edn (ASE, 2006)

Preparing COSHH Risk Assessments for Project Work in Schools (SSERC, 1991)

SSERC hazardous chemicals database (www.sserc.org.uk/health-safety/chemistry-health-safety/hazchem_database-2/)

Be Safe! Health and Safety in School Science and Technology for Teachers of 3- to 12-Year-olds, 4th edn (ASE, 2011)

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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.

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/content/submission-guidelines.

Themes being considered for the future for which submissions are invited:

- The periodic table
- Science applied to healthcare

Reaching the fourth edition of this academic year means that we have now completed 100 years of production of *School Science Review*.

This edition starts with two *Science notes* in chemistry. Charles Gill explains the 'pink milk' experiment in which enzyme action is tested. The colourful chemistry is well illustrated by clear photographs. Christopher Talbot explains the different types of series that are used in chemistry to denote how strongly substances can react and shows that different methods give different results.

As in recent years, we invited presenters at the ASE Annual Conference in Birmingham in January to offer written versions of their presentations, to make the content available to people unable to attend. Being illustrated talks initially, it takes time to convert most items into written form, and some are not yet complete. Six items are included here, and others will follow in subsequent editions.

There is significant variety in the topics. A biology investigation making use of yeast from the Scottish group SSERC contrasts with a mathematics delivery from Japan to develop understanding of the very large distances involved in astronomy. Carol Davenport explains how a recent directive expects that science teaching should offer pointers towards uses of science in careers and includes a particular focus on healthcare.

Learning about a context that makes use of science is seen as a way to enhance interest and so develop enthusiasm and understanding. A group from the University of Bristol looks at the development of thinking skills and sharing of knowledge, while Ewan MacRae considers how teachers benefit from educational trials. Finding the optimum way to enable students to understand what they are learning should always be at the forefront of teachers' minds.

The final article in this set is from Richard Spencer, whose offering last year explained illuminating football pitches to help damaged areas of grass to regrow quickly. In a very different context, he has encouraged students to produce a film explaining how genetic testing can sometimes give unexpected results. In modern police dramas on television, 'We've got DNA' is a phrase often used as a claim for indefensible guilt. This film deals with a case in which a paternity test gave an apparently false result, but thankfully the correct answer was found.

The use of woodlice for investigation of animal behaviour is quite popular in biology classes. The individually submitted articles begin with an investigation by

Alexandra Myers Annett's students into whether woodlice can be trained using a stimulus–reward procedure.

Bananas are also popular for biology investigations and have provided Robbie Kirkham and Ed Walsh with an investigation suitable for GCSE level (age 16) into fungal disease in crops to teach about food security.

Demands on schools caused by examination accountability can discourage wider learning. However, Sam Green provides a brief description of a day spent by 6th form students at an exhibition in Liverpool which illustrated the working of particle accelerators. A useful insight into pursuing science beyond school level!

In a contribution from Canada, consideration is given to aspects of chemistry that students can learn from popular reading material. This may not be well known to adults but apparently there is much to be learned from 'Iron Man'.

In a similar vein, Jeffrey Nordine working in Germany explains how students can learn inquiry skills in the context of *Super Mario Bros.* – heroes of the small-screen gaming gadgets that many children can't seem to leave alone (if my observations are typical).

However, education cannot all be fun, and the edition concludes with three articles concerning accountability.

The first of these has been compiled by Alastair Gittner and Chris Harrison on behalf of the ASE Research Committee. This is one of our Association's own committees that meets regularly to consider progress in educational methods and their effectiveness in learning, based upon information from many sources. All teachers want their students to perform well, but the same methods for achieving a good level of understanding and learning do not suit every student.

Sometimes when methods are changed, popular strands are left out. Richard Brock and Keith Taber feel that understanding the 'nature of science' was motivating for some students, but, after being given a high profile not long ago, they think it sad that it has now been taken out of the main thrust.

An important skill in achieving good performance in final examinations is memorising facts. In the final article, Ken Rotheram explains how having structured revision as a feature during and at the end of every lesson can help students to remember the significant details.

Geoff Auty

Editor, *School Science Review*