



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

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Contents

School Science Review March 2019, 100(372)

- 5 Editorial**
- 6 Science notes**
- 6 **Possibilities for buffer capacity investigations** *Christopher Talbot and Norman Billingham*
- 9 **Batteries: from excavations to electric vehicles** *Frank Harris*
- 13 Theme editorial: Teaching science through everyday issues**
Keith Ross
- 14 A leaf floats down in autumn: growing science from everyday happenings**
Keith Ross
So much science can be derived from the simple action of a falling leaf; when students link their understanding of science to everyday happenings, will it stay with them beyond their school days?
- 16 Applied science in the kitchen**
Geoff Auty
A look at examples of how scientific thinking can be applied to cooking, transferring liquids and washing up
- 21 The benefits of setting science in an everyday context: a primary school perspective**
John F. McCullagh and Andrea Doherty
The people, places and materials of our everyday world are easy to incorporate into science teaching at primary level, so what are the lessons for secondary science?
- 28 Including real-life global contexts within science teaching**
Julie Brown
Practical Action's teaching resources provide a wealth of free high-quality materials that support the teaching of science within a real-life global context
- 33 Chemistry doesn't just happen in test tubes**
Peter Borrowes
Chemistry occurs in and around our homes – from church gargoyles to lightning conductors, from bricks to rubbish bins, and from hair treatments to autumn leaves – don't miss out on important motivating experiences
- 41 Using homework to develop science capital**
Matthew Livesey and Leigh Hoath
'Science capital' is our students' science baggage – we set the theme academically and then describe what happened when we asked students to find links between their home environment and school science
- 44 Using Urban Science to teach climate change**
Maarten Tas, Margaret Fleming and Richard Dawson
A homework task on climate change as part of a project on sustainability – 'Urban Science' – with the students' work being displayed on a 'messy wall' so links can be made and content evaluated
- 51 How to provide clear links between the world we live in and science at A-level**
Sandrine Bouchelkia
Sixth-formers find ways to link the science they study with their everyday lives through diabetes research, studying HIV, reading science fiction and so much more
- 55 Links to everyday life: small tweaks to teaching science that can make a big difference**
Jessie Mytum-Smithson and Mary Howell
Tweaks to classroom practice help students make connections between their everyday knowledge and science, increasing their 'science capital'; will this help those with fewer chances to continue their interest in science?
- 61 Teaching rates of reaction using everyday happenings and the problem of temperature**
Keith Ross
Concepts in chemistry, such as why a 10 °C rise in temperature often doubles the rate of slow reactions, can be difficult to understand until they are illustrated by our everyday experiences
- 64 The analysis of Milk of Magnesia by acid-base titration**
John F. McCullagh
The analysis of this household product provides an excellent everyday example of a neutralisation reaction and allows students the opportunity to consider the contents of a pharmaceutical product

69 Students becoming researchers

Lynda Dunlop, Kerry J. Knox, Judith Bennett, Michael J. Reiss and Rebecca Torrance Jenkins

How practical independent research projects can support young people to become scientific researchers

76 Open badges Part 3: framework and strategies in action

Naomi Hennah

The case for teaching manipulative and procedural competencies and how to do so is demonstrated, with a trial implementing the open badge framework and strategies in an informal setting

86 Reviews

93 Science websearch

96 SSR special issues

96 Advertisers index

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

Two *Science notes* start the edition, both from long-standing contributors. Christopher Talbot, on this occasion with Norman Billingham, describes and explains the use of buffer solutions in practical chemistry. The style is intended to lead students through doing the practical work themselves; useful guidance is given on both practical and mathematical techniques. Frank Harris offers an interesting historical account of the development of batteries, which are so essential to modern life. Years ago, the common use for batteries would be for torches, and then portable radios. Now, there is greater interest in batteries for smartphones and laptops, applications that require the batteries to be rechargeable. However, an even bigger challenge coming our way is powering the electric car. Recharging can not yet match the convenience of using of liquid fuels.

Guest editor Keith Ross is another long-standing contributor. He introduces the theme on 'everyday science' on page 13. So often, we can become narrowly focused on working to exam specifications, getting the calculations correct and doing practical work in labs, and forget that there are many applications of science that students can, and should, experience outside school and beyond the guidance of teachers. We teach chemistry in school. Students or parents will go to a chemist's shop. How are these shops related to chemistry lessons? Just one article considers a pharmaceutical product, but science can be applied in the home and garden, and to many other everyday experiences.

Good teaching should ensure that, when students eventually leave school, they will still think in a scientific way about things they do at home and in the workplace. Making this connection, some articles focus on what we can see around us and on ways of helping to explain our observations. This should help to make science subjects seem more important and more relevant to those

students who become disaffected by science during their years of compulsory education.

Two more articles complete this edition. Five authors have collaborated to suggest how students can become researchers. The core of the group is based at the National STEM Learning Centre in York and is supported by others from elsewhere. Internet communication makes such collaboration simpler than in the past.

It is always tempting for both students and teachers to work to the textbook. However, in addition to learning and explaining how things happen when they have already been discovered, science is also about discovering new things. Over a few hundred years, discoveries that enabled Isaac Newton, Michael Faraday, Charles Darwin and many others to become famous were made by those individuals on their own premises. Now, there is an expectation that science research demands expensive facilities with large teams of scientists and technicians. But are there small discoveries that students can make if suitably encouraged?

The final article is from Naomi Hennah and completes the series on 'open badges'. The first two articles were in our December 2018 edition. Open badges are not tangible like pin-on metal badges, but are images used in a record of progress that can be held on a computer, and they act as pictorial evidence of achievement. Open badges could move with the student from class to class or school to school, if the system becomes widely adopted. This development is reported by a teacher working at secondary level (age 11–18), but was trialled in the after-school activities of a primary school.

Overall, this seems to be a very accessible edition. Whatever your subject or educational specialism, I think it is possible to find many interesting articles here.

Geoff Auty

Editor, *School Science Review*

Safety notice

We published a photograph on page 75 of the December 2018 issue of *School Science Review* to illustrate that a practical activity with a high level of hazard can be effective in engaging students and give a context for effective learning. It is essential with hazardous activities to take sensible and effective precautions so that the chances of any serious harm are very low, otherwise the practical activity could become memorable for the wrong reasons. With planning and good design, this can be done without lessening the excitement of the activity. We apologise that the photograph does not show evidence of sensible or effective precautions. We strongly advise that the activity demonstrated in the photograph is not undertaken as shown. For that reason, we have removed the photograph from the online version of the journal.