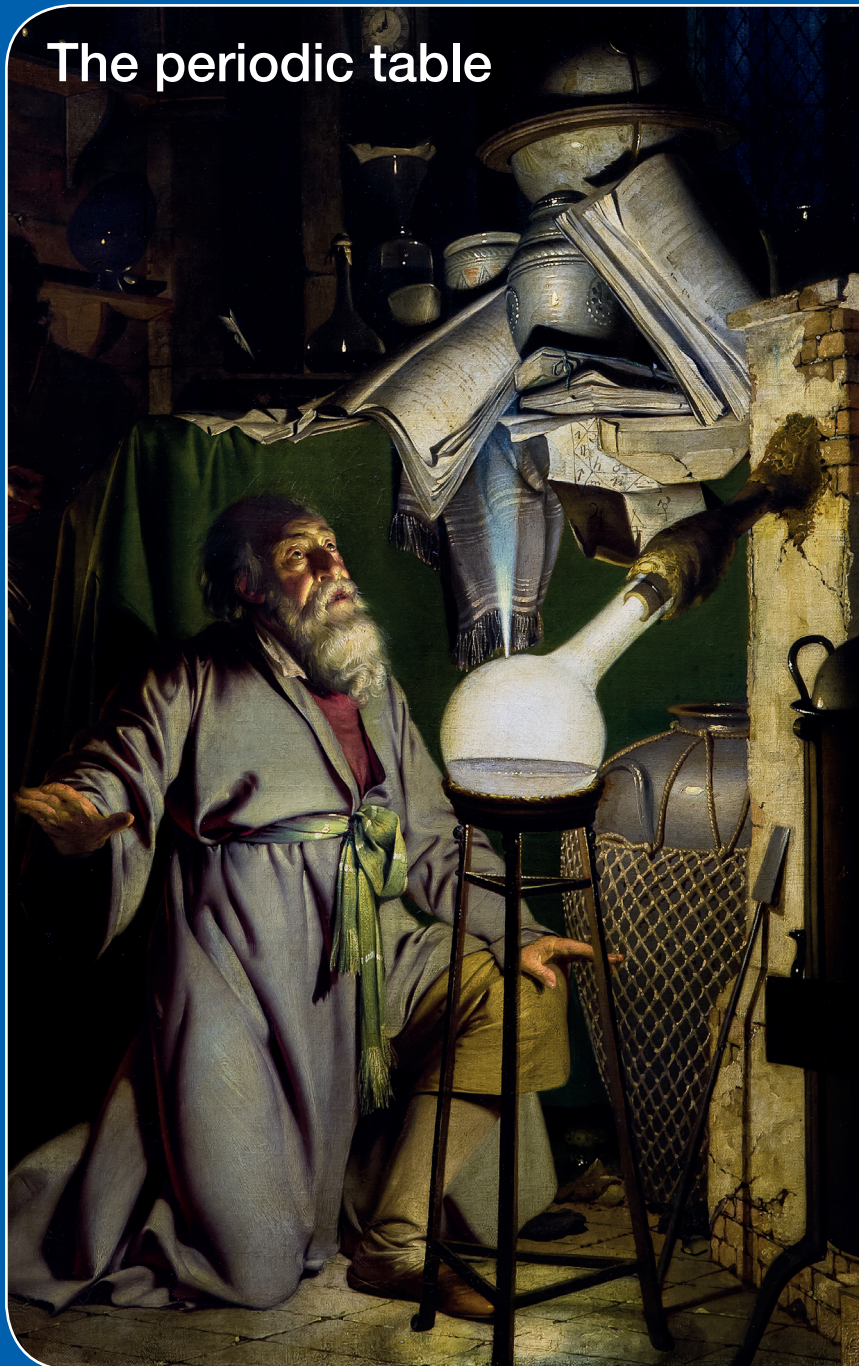


The periodic table



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

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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.

Front cover images (clockwise from left): *The Alchymist, in search of the Philosopher's Stone, discovers phosphorus, and prays for the successful conclusion of his operation, as was the custom of the ancient chymical astrologers*, by Joseph Wright of Derby, oil on canvas, exhibited 1771, reworked and dated 1795, courtesy of Derby Museums; 'modern-day chemist' and guest editor for this issue, Hal Sosabowski, demonstrating the 'phosphorus sun', image © Ian Gillett; Hal and his 'dichromate fireflies', image © Ben Lester (<https://throughbenslens.co.uk>)

Reaching the end of a calendar year is always a time for looking back and thinking forward.

2019 has been celebrated as the International Year of the Periodic Table. Thanks to Hal Sosabowski, we have developed a large theme which was partly contained in the September edition and is completed here. Hal provides his own overview of the topic on page 45 as well as contributing or part-authoring articles.

A similar story fits the remainder of the content. As I explained in our September edition, I recognised some time ago that many teachers cannot attend the ASE Annual Conference because school terms have already started, and they miss the opportunity to see and hear some extremely good presentations. An enthusiastic response from presenters has brought more written versions to follow those that have already appeared in June and September.

The first of these comes from Chris Harrison and Paul Black, with a number of other contributors. It recalls the initiative on formative assessment, leading to *Inside the Black Box*, for which Paul Black and Dylan William were responsible, and the development of 'Assessment for Learning'. It was more than testing a level of knowledge, as it also concerns supporting future progress. Of course, exams don't go away, and the next contribution is from Stella Paes, formerly Head of Science Qualifications at AQA, who considers recognising and then bridging the gap in skills required between 11–16 and post-16 education in the sciences. Coping with the required knowledge in mathematics is a big factor.

Rachel Dorris describes an initiative to address this problem – a project backed by the Royal Institution in which post-16 students run classes on Saturday mornings for children from primary schools. This activity also has support from industry and higher education. Enabling children to enjoy mathematics and to feel that they can achieve success is an important consideration in helping them to feel confident in the sciences. A third article for encouraging participation in sciences, especially for girls and children with special needs, is offered by Laura Hobbs and Laura Fogg-Rogers. One of the three projects described makes use of the computer game *Minecraft*, which is very popular with children, but the initiative goes much further in providing insights into engaging under-served audiences.

A short article by Lynda Ware describes workshops that can be delivered to schools on how to think critically about healthcare advice. Newspaper headlines can suddenly change fashions in diets, for example, but are those headlines based on scientific facts? A much larger article from Neil Ingram explains research in genetics

being used to try to understand why some people are more susceptible to certain kinds of illness. Finding out 'why?' may be only the start; it must be hoped that finding preventions and cures will be the stage that such initiatives will achieve eventually.

Three contributors working in various parts of western England collaborated on a presentation about the work of the National Association for Environmental Education. Their article explains many opportunities for activity related to environmental investigations in the classroom and on field trips. They also decry the fact that many school courses on environmental science that evolved in the 1970s have been squeezed out by the rigidity of the National Curriculum.

A team from the University of Leicester describe the 'Next-Lab' project. It is a European research project aiming to enhance teaching and learning at primary and secondary levels by providing online observation of, and participation in, activities that are difficult (sometimes impossible) to arrange in school laboratories. Then, recognising that students can not handle the universe, Miles Hudson offers a simple activity for students to try for themselves to illustrate how the universe is expanding.

The remaining articles in this set highlight the fact the education in science should be about more than just learning what is in the book.

Michael Hinton in Cambridge and working with contacts in the Netherlands, explains a project in which students from both countries collaborate on a range of genuine life-science research projects.

Finally, a team of 11 presenters coordinated by Becky Parker explain how schools can contribute to existing research programmes in topics as diverse as space exploration and healthcare. Each participant had a very limited amount of time to present their cases; the variety in these rapid presentations shows that, despite the prescribed and sometimes narrow examination agenda, there is still a broad education in science happening in the background.

I hope that the items we have featured this year from the Birmingham ASE Conference have helped to inform teachers who could not be there (and give valuable reminders to those who were). Term will have started by the time of the Conference at Reading in January 2020. We hope to continue featuring more Conference articles in the coming year.

20/20 is a term developed in the USA to indicate clear vision. Let's hope that in 2020 we all see a clear way forward in all our diverse roles.

Geoff Auty

Editor, *School Science Review*