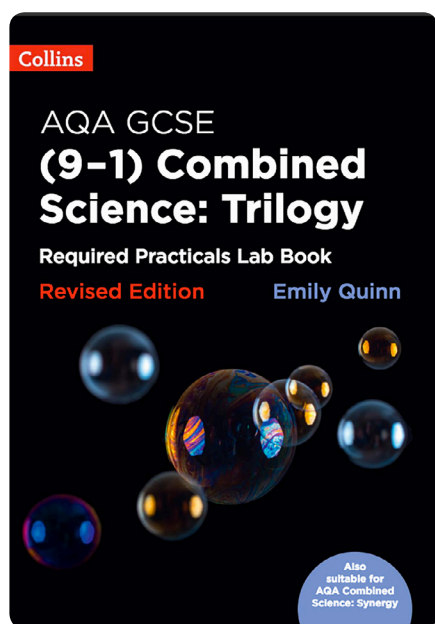


# Reviews

Reviews published in *School Science Review* are the opinions of individual reviewers, and are not an official Association for Science Education (ASE) view or endorsement of the resource. Reviewers are selected to write reviews on the basis of their experience and interests. They are expected to draw attention to perceived weaknesses or limitations of a resource as well as its strengths. The reviews are written from the standpoint of someone seeing the materials for the first time and considering how they themselves would use them, or think colleagues would be likely to use them.

- 88 AQA GCSE (9-1) Combined Science: Trilogy. Required Practicals Lab Book *Emily Quinn*
- 88 AQA GCSE (9-1) Biology. Required Practicals Lab Book *Emily Quinn*
- 89 AQA GCSE (9-1) Chemistry. Required Practicals Lab Book *Emily Quinn*
- 89 AQA GCSE (9-1) Physics. Required Practicals Lab Book *Emily Quinn*
- 90 *Conjuring The Universe: The Origins of the Laws of Nature* *Peter Atkins*
- 91 *Illumanatomy* *Kate Davies*
- 91 *How to Read the Weather* *Storm Dunlop*
- 91 Reviewers



## AQA GCSE (9-1) Combined Science: Trilogy. Required Practicals Lab Book

*Emily Quinn*

London: Collins, 2018

105 pp. Price £2.50

ISBN 978 0 00 829164 8

This book is aimed at the AQA Combined Science Trilogy GCSE, but it is also suitable for the Combined Science Synergy course.

It has 21 practicals, each one with background information for the topic, common mistakes, the method for the experiment,

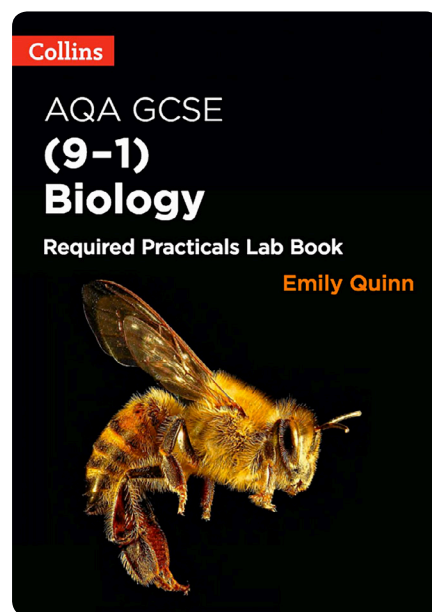
notes on any safety issues and space to record results. This is followed up by questions about the experiment to check the student's understanding and further questions to give practice in answering exam-style questions. Not only does it help students to complete their practicals, but it provides students with a way of storing all their work in one place and keeping everything in order. It also provides evidence of what they have done.

The book provides help with some of the mathematical aspects of the practicals, from including formulae, to help in converting units, and is very student-friendly in this respect. It has answers to questions at the end of the book.

With the introduction of required practicals into the new GCSEs, lab books like this become an essential tool for students and teachers. My students have benefited from using lab books and, at the price, buying books like this becomes a very cost-effective way of doing the work. You get a lot of really good material for a very small price. I can highly recommend

this book to students and teachers, for both high quality and value for money.

*Ann Reddecliffe*



## AQA GCSE (9-1) Biology. Required Practicals Lab Book

*Emily Quinn*

London: Collins, 2018

44 pp. £1.00

ISBN 978 0 00 829161 7

As a current teacher of the new AQA syllabus, I was delighted to receive this book to review. Teachers all across the country have been waiting three years for good-quality

resources to be produced for the new practical activities, and at long last they are here.

Each experiment is set out with the following format: learning outcomes, maths skills, apparatus, safety and the method. There is a useful section on common mistakes, and exam-style questions following each practical. The exam-style questions are a decent mix of one–six marks, though they are not differentiated into foundation or higher. I personally would like two versions of this book, one for each tier, in order for me to maximise the potential learning gains from them. I feel that pupils will gain enormously from spending less time on writing out experiments, and more time focusing on their understanding of what they are doing. I think there could be more emphasis on the higher-order skills such as evaluating and concluding following on from the experiments, and also more questions about errors.

This is a well-structured book that is worth the investment if you are looking for a one-size-fits-all approach to make the teaching of required practicals easier on staff. However, I would bolster it with additional exam questions for the higher tier pupils.

*Kate Cree*

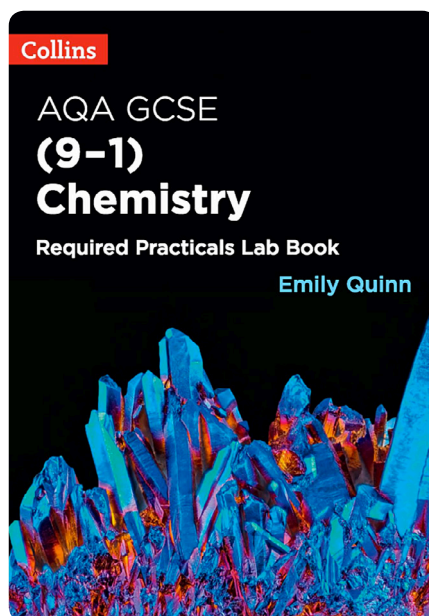
**AQA GCSE (9-1) Chemistry.  
Required Practical Lab Book**  
*Emily Quinn*

*London: Collins, 2018*

*44 pp. £1.00*

*ISBN 978 0 00 829162 4*

As the title suggests, this A4 lab book provides comprehensive coverage of the eight practicals required for the AQA GCSE in chemistry. It is intended that each student should have their own copy. Copyright restrictions prevent it being used as a master copy for photocopying purposes.



The content for each practical comprises a contextual introduction, learning outcomes, an apparatus list, some safety notes, a step-by-step method and some common pitfalls for students to look out for. With tables supplied for recording results and follow-up questions to test understanding (with answers), the book certainly provides the students with ample opportunity to get the most out of completing these stipulated experiments. Additionally, higher tier material is clearly identified and can be completed or ignored depending on the target grades of the students.

At first look it seems like an excellent concept: the student has all the practical work in one place; it saves time designing materials as well as the inevitable time photocopying worksheets; and the apparatus lists for the technicians are provided too. However, a closer look at the book left me far less convinced of its value, primarily because I was not persuaded that a one-size-fits-all approach will work.

The introductory pages for each practical are packed with information, arguably too much information for all but the most able; the methods are sometimes quite involved and frequently the students are told what is going to happen so the investigative nature of the practical

work is difficult to identify. Tables for results are provided for all exercises, where I would like to have seen some more open-ended approaches for the more capable students to get their teeth into. In some of the practicals there are multiple tasks that would be spread over a number of lessons. For these activities, the layout of presenting all the methods and then providing all the different results tables does not seem logical and is not helpful, particularly for the less-able student. In short, in my view, attempting to provide access to all abilities has resulted in a product that cannot suit all.

If the 'pros' appear to outweigh the 'cons' of adopting such a resource I would recommend a really careful read through all the material to check that it will dovetail in with your departmental style of teaching and philosophy with regard to integrating practical work into conceptual learning. It will also need to suit your scheme of work and its assessment procedures and you will need to be convinced that, by separating the records of these experiments from the rest of the students' work, it will prepare all your students effectively for the written exam as well as tick the boxes for the practical assessment. For me, there were too many places where I would find myself having to communicate modifications to my classes, either because of the wording in the procedure or because the style of practical would not allow me to build it into my preferred teaching sequence for that topic.

*Janet Mitchell*

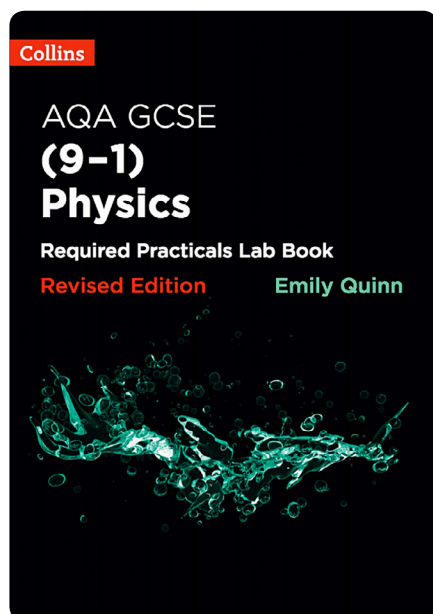
**AQA GCSE (9-1) Physics.  
Required Practical Lab Book**  
*Emily Quinn*

*London: Collins, 2018*

*52 pp. £1.00*

*ISBN 978 0 00 829163 1*

Oh, what happy hours students used to spend copying out methods, diagrams, outline results tables and



such like, before being set loose using the science apparatus and actually doing the experiment! OK, perhaps that is a rose-tinted view of how we recorded practical work in the past: for many the written element was perceived as a low-value prelude to the main event, a chore to be endured.

This book includes ten practicals and two pages of equations. It has a slightly different heading convention for units compared with the exam board's specimen material. The lab book puts them in brackets as, for example, 'length (cm)' rather than the 'length in cm' style of the specimen exam material released by the exam board. I prefer the former, but ideally I would want to do as the exam board does.

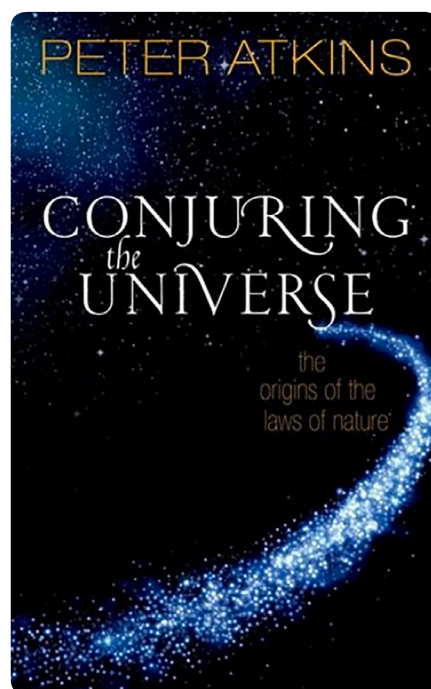
'Common mistakes' is a hints and tricks section to help get the practical to work, or to remind you that the real world is imperfect, so a slightly fluctuating ammeter or voltmeter reading, for example, is no big deal.

A major plus, in my opinion, is the inclusion of 'check your understanding' and exam-style question sections following each of the practicals, so students can get more practice at types of questions that were thinner on the ground in the pre 9–1 incarnation of the GCSE. Teachers could set these as

ready-made homework exercises (answers are provided).

The layout is reasonably tidy, although with some fairly text-dense pages. However, this minor negative is easily outweighed by the benefit for students of being freed from the drudgery of so much copying, and allied with the accompanying questions, the very low price of the book makes it a veritable must-buy.

*Ian Francis*



**Conjuring the Universe: The Origins of the Laws of Nature**

*Peter Atkins*

*Oxford: Oxford University Press, 2018*

*187 pp. £19.99*

*ISBN 978 0 19 881337 8*

Peter Atkins sets out his ambitious agenda for this book right at the start when he says that he wants to convince the reader that '*not much happened at the Creation*' despite the rather dramatic language of the 'Big Bang'. I think what he means is that the universe can be described by some deep fundamental laws that naturally arise and, once in play, there are other consequences that we also recognise as laws of nature: as a result no special interventions are needed at the start. His premise is that the laws of nature arise from

a combination of what he refers to as indolence, anarchy and ignorance.

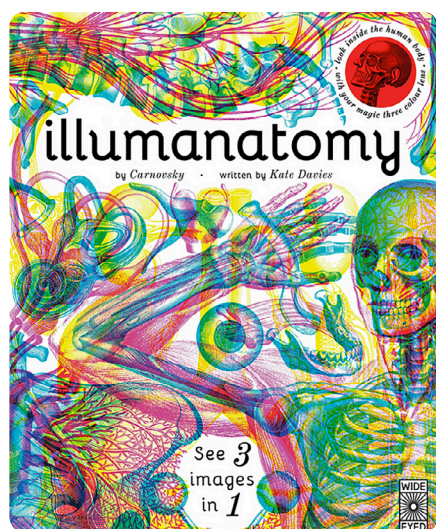
To achieve this end, he takes the reader through the major physical laws of nature, starting with conservation of energy and working through classical mechanics, quantum mechanics, electromagnetism and thermodynamics. His arguments are made without any mathematical equations or formalism, although the arguments themselves can be quite complex and subtle. A notes section at the end of the book provides more detailed explanation of some points, particularly those requiring a more mathematical approach. The strength of the book is the many interesting insights he offers the reader. I particularly liked his explanation of the second law of thermodynamics where he discusses the role of entropy without resort to any equations.

One of the last chapters in the book, 'Measure for Measure', looks at the origin and size of the fundamental constants such as the velocity of light, Planck's constant and so on. His central point is that many fundamental constants are really artefacts of the units we chose. I found this particularly delightful, as he demolishes the need for one constant after another. For example, Planck's constant is redundant if energy and frequency are in the same units. This is not such a difficult idea as we already at school level teach the energy–mass equivalence pointed out by Einstein. We may also have students look at how the size of the metre is established via a time measurement. The implication is that a distance unit as such is unnecessary, and it is a short hop to say goodbye to the velocity of light  $c$  as a constant. He does of course acknowledge that, in the technological world, units of measurement are a practical necessity but his argument relates to trying to see what the inner workings are.

However, he also acknowledges that he cannot explain away at least two coupling constants, that is the charge on the electron and the gravitational constant, big G.

This is an interesting book to read and offers many interesting insights. However, I have some reservations about the writing style, which I feel younger readers would not be happy with. I fear that many young people picking this book up will take one look at the language and return it to the bookshelf, which is a pity.

*Alex Chaplin*



### **illumanatomy**

*Kate Davies*

London: Wide Eyed Editions (Quarto Publishing), 2017

64 pp. £20.00

ISBN 978 1 78603050 4

This is an illustrated book of anatomy. Several of the pages consist of three-colour illustrations, which you look at through coloured filters revealing different parts of the body.

There are three coloured filters provided, mounted in a cardboard strip. You close one eye and hold the coloured filter strip up to the other eye. Looking through the red filter, you see the bones, looking through the green filter you see the muscles and the blue filter shows the organs and blood vessels. I found the blue filter to be quite dark, meaning that it was harder to see the organs and blood vessels clearly. The red and green filters worked really well.

The book is divided into sections, covering the whole body. Each section starts with three-colour drawings, which allow you to uncover the different layers of the body and see how they fit together. The pages that follow show detailed black-and-white drawings of the same part of the body, labelled to show what the different parts are called and what they do. The explanations are clear and readable; technical vocabulary is used to name different features, but this is not a barrier to understanding.

This is a good book for a school library. It is suitable for upper key stage 2 or key stage 3 students. Adults will enjoy it too.

*Ann Reddecliffe*

### **How to Read the Weather**

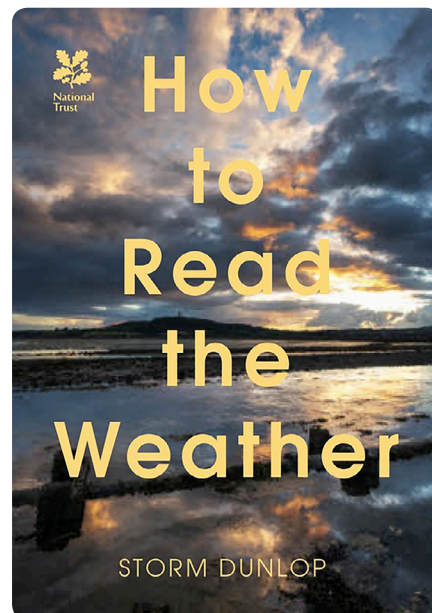
*Storm Dunlop*

London: National Trust Books, 2018

176 pp. £12.99

ISBN 978 1 911358 24 4

This book provides an introduction to the science of meteorology – a sort of Weather 101.



It consists of six chapters: Weather Fundamentals; Clouds; Highs and Lows; Severe and Unusual Weather; Colours in the Sky and Other Optical Phenomena; and Weather Forecasts. The language of the text is straightforward, and should be accessible to older secondary-age students, but there is a lot of detail to absorb. That is not to imply that the presentation is offputting; far from it. Along with the summary tables there are plenty of colourful diagrams and photographs of relevant weather features, plus lots of coloured boxes with snippets of interesting information that will tempt you to dip into the book and start exploring.

For the general reader who is willing to invest a little effort, this book will help them to understand the science of the weather. It would make a good addition to a school library or a nice prize book.

*Miriam Chaplin*

### **Reviewers**

**Alex Chaplin** is a former Head of Science and taught science in London schools for over 20 years. He currently works in an FE college.

**Miriam Chaplin** is a STEM

education writer, editor and teacher trainer.

**Kate Cree** is a science teacher in the North West.

**Ian Francis** is a physics teacher

and examiner.

**Janet Mitchell** teaches chemistry in south west London.

**Ann Reddecliffe** teaches science in Leicestershire.

### **Would you like to review books for SSR?**

If you would like to join the SSR book review team, please send an email with 'Book review team' in the subject line to [janehanrott@ase.org.uk](mailto:janehanrott@ase.org.uk).