

# Fantastic new **AS and A2 Science** resources from Hodder Education, the leading A level Publisher

At Hodder Education we work with more examiners and experts than any other publisher to ensure you and your students get the very best resources. To support you we have materials that match the following specifications:

- **AQA Biology AS and A2**
- **Edexcel Biology AS and A2**
- **Edexcel Chemistry AS and A2**
- **Edexcel Physics AS and A2**
- **OCR Chemistry AS and A2**
- **OCR Physics AS and A2**

**Buy your A level Books today!**



**See the order form for some fantastic special offers or call 01235 827720 to order an inspection copy**

# AQA Biology for AS and A2

## About the authors:

**Mike Bailey** is a former Chief Examiner and has over 30 years experience of teaching and examining A Level Biology.

**Bill Indge** is a Chief Examiner and an experienced teacher and is co-author of the bestselling **A New Introduction to Biology**.

**Martin Rowland** is an experienced teacher and senior examiner. He also co-wrote the bestselling **A New Introduction to Biology**.



**AQA Biology** is tailored precisely to the new AQA Biology specification and has been developed by highly experienced authors to support students in written and practical work.

## The Student's Books:

- Provide practice in investigating biological problems and addresses the new investigative skills assessments, as well as 'How Science Works'
- Include progress questions for students to check they have understood concepts
- Provide analysis exercises to give practice in investigating biological problems

## Dynamic Learning and Assessment Network Edition CD-ROMs:

bring your lessons to life and provide interactive activities, including progress tests, quizzes, PowerPoint presentations and animations along with powerful, easy-to-use Lesson Builder technology.

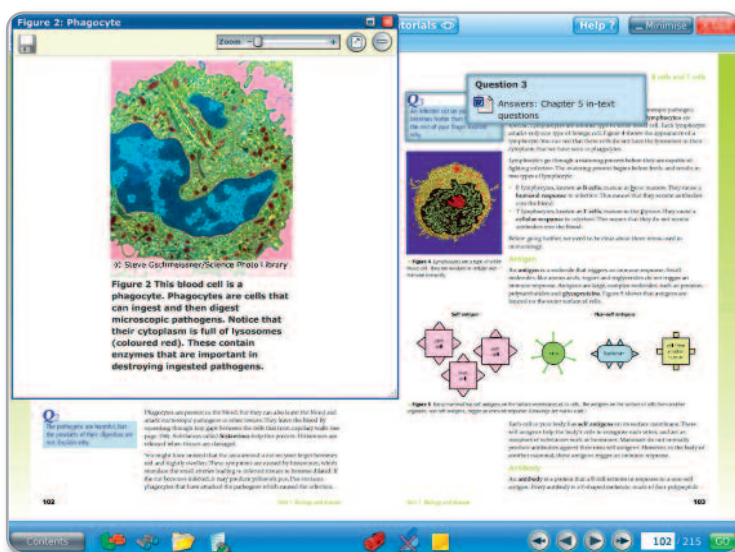
Also included are:

- **Answers** to all questions in the Student's Book
- **Notes for teachers** on common errors students make in exams
- **Animations** perfect for highlighting difficult concepts during lessons
- **Worksheets** that cover the 'How Science Works' objectives
- **Interactive progress tests** so you and your students can check comprehension and progression

**'AQA Biology is a fantastic course. The quality of materials is extremely high, they are clearly illustrated and fully support students in preparing for their examinations.'** *Head of Science*

## Dynamic Learning Student resources:

- Included free with the Student's Book
- Provide an interactive version of the textbook to support independent study
- Include tips from the examiners, skills tutorials and worked examples to guide students through selected problems
- Include Stretch and Challenge resources to support your students seeking the very best grades



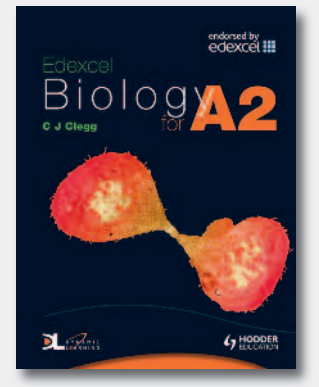
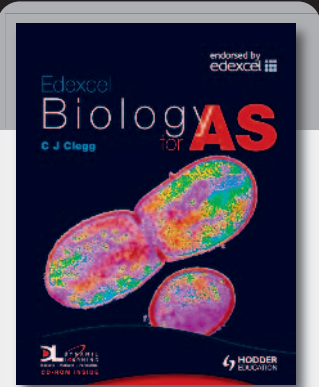
An example from AQA Biology Dynamic Learning and Assessment Network Edition CD-ROM

# Edexcel Biology for AS and A2

## About the author:

**C J Clegg** is an experienced author and examiner, and has written several highly successful books for Hodder Education.

endorsed by  
**edexcel**



We work closely with Edexcel to produce endorsed materials so you can be sure that our resources are reliable, accurate and fully meet the requirements of the specification. They are also fully supported by our digital resources.

## The Student's Books:

- Start at the level required for a Grade C pass at GCSE in the AS Book
- Identify 'How Science Works' examples throughout to provide relevant and integrated coverage, ensuring that students really understand the wider issues in science
- Include self-assessment questions, encouraging comprehension and research, helping your students develop as independent learners

## Dynamic Learning Student resources:

- Included free with the Student's Books
- Provide access to extension material for A\* candidates
- Include activities that allow students to consolidate their learning
- Support students who want to aim for the very best grades by supplying plenty of exam-style questions

## Dynamic Learning and Assessment

**Network Edition CD-ROMs** can be used either on a school network or to add instant content to a VLE. They also provide a further range of activities and Personal Tutor tutorials to enliven your lessons and engage your students. A unique Lesson Builder function can be used to 'drag and drop' resources into a lesson that can then be exported and shared with colleagues or students.

Also included are:

- **Animations** perfect for highlighting difficult concepts during lessons
- **Interactive progress tests** so you can check on your students' comprehension and progression
- **End of Topic tests**
- **PowerPoint presentations**

**Table 2.4: The composition of air**

	inspired air	alveolar air	expired air
Oxygen	21	16	16
Carbon dioxide	0.04	5.5	4.0
Nitrogen	78	81	79
Water vapour	variable	variable	variable

**Figure 2.23: Gas exchange in the lung**

**Figure 2.24: The structure of an air capillary**

**Figure 2.25: The structure of an air capillary**

**Activity 2.6: The world of a red blood cell**

**Extension: Efficiency of lungs as organs of gas exchange**

**2.2 Proteins and enzymes**

**Amino acids – the building blocks of peptides**

**Figure 2.27: The structure of an amino acid**

**Figure 2.28: The structure of an amino acid**

A spread from Edexcel Biology for AS Student's Book

Order your class set today – see the order form for some fantastic special offers. Or order your Inspection copies on 01235 827720.

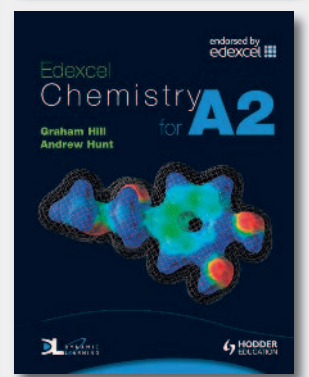
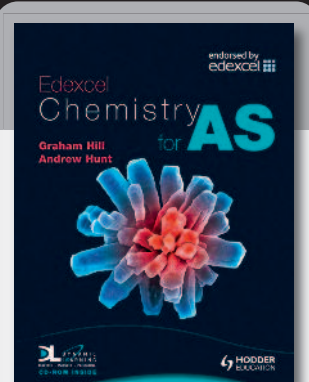
# Edexcel Chemistry for AS and A2

## About the authors:

**Graham Hill** taught in schools for over 30 years. He is the author of bestselling A level and GCSE Chemistry textbooks as well as numerous successful dual award publications.

**Andrew Hunt** is an experienced, teacher, examiner and author. He has taken a leading role in the Nuffield Chemistry, Twenty First Century Science and Science in Society projects.

endorsed by  
**edexcel**



**Edexcel Chemistry for AS and A2** have been developed for the new specification. We have worked with authors whose reputation is unsurpassed and have been endorsed by Edexcel so you can be sure that they fully meet the requirements of the GCE Chemistry specification.

The **Dynamic Learning and Assessment Network Edition CD-ROM** provides a complete bank of resources for the course including video, animations, interactive progress tests, answers to questions, practical worksheets with Teacher's and Technician's notes and rotatable images of molecules.

## The Student's Books:

- Provide both quick 'test yourself' questions and end of chapter review questions to ensure the contents of each topic have been fully understood
- Include data analysis and comprehension activities throughout the book to help students and teachers address the new 'How Science Works' themes

Also included are:

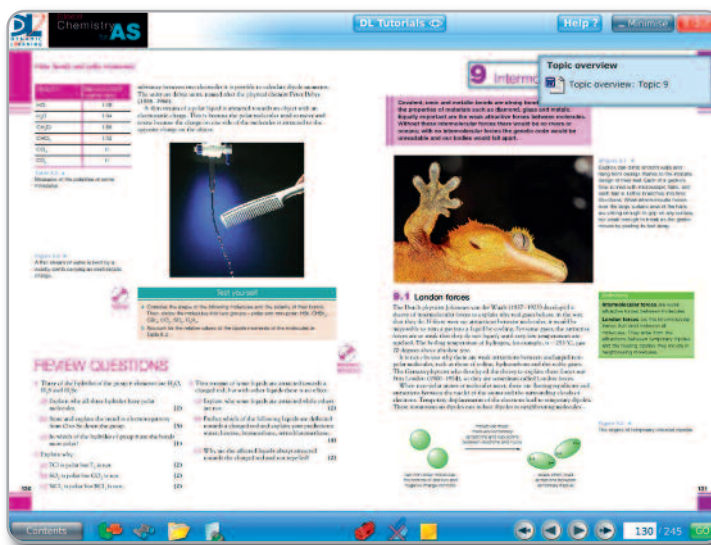
- **Answers** to all questions in the Student's Books
- **Extension activities** to stretch your most able students
- **Interactive Assessment** to enable you to test your whole class or individual students to see how well they have understood a topic
- Introductory **PowerPoint presentations**

**'Simply outstanding new Edexcel course which really puts Chemistry in a real-world perspective. The books are clearly illustrated in superb detail. These books have alleviated the stress of preparing for a new course and are essential for any teacher ... Due to these factors, the new Edexcel course is a dream to teach with awesome resources.'**

*Andrew Ward, Teacher, English School Kuwait*

## Dynamic Learning Student resources:

- Included free with every Student's Book
- Provide an interactive version of the textbook
- Provide access to extension questions to support students who are aiming for the very best grades
- Guide students through difficult concepts via Personal Tutor presentations
- Include learning outcomes and data tables



A screenshot from Edexcel Chemistry Dynamic Learning and Assessment Network Edition CD-ROM

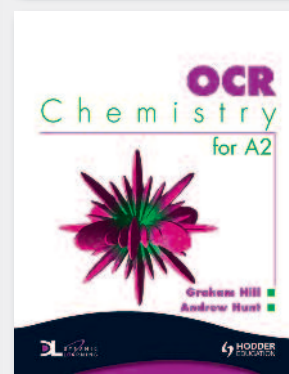
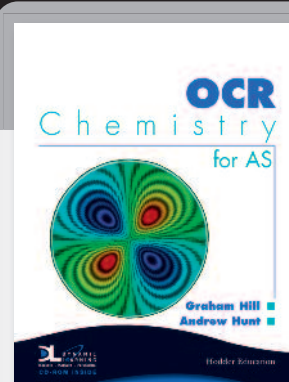
Find out more about Dynamic Learning and Personal Tutor on page 8.

# OCR Chemistry for AS and A2

## About the authors:

**Graham Hill** taught in schools for over 30 years. He is the author of bestselling A level and GCSE Chemistry textbooks as well as numerous successful dual award publications.

**Andrew Hunt** is an experienced teacher, examiner and author. He has taken a leading role in the Nuffield Chemistry, Twenty First Century Science and Science in Society projects.



Our new suite of OCR Chemistry resources have been developed by two highly experienced authors to support the new OCR AS and A2 Chemistry specifications.

## The Student's Books:

- Provide an exact specification match to the new OCR specifications
- Provide data analysis exercises and comprehension activities to help teachers and students address the new 'How Science Works'
- Include quick 'test yourself' questions throughout the book to ensure the content of each topic has been fully understood and to enable students to familiarise themselves with the new style of exam questions

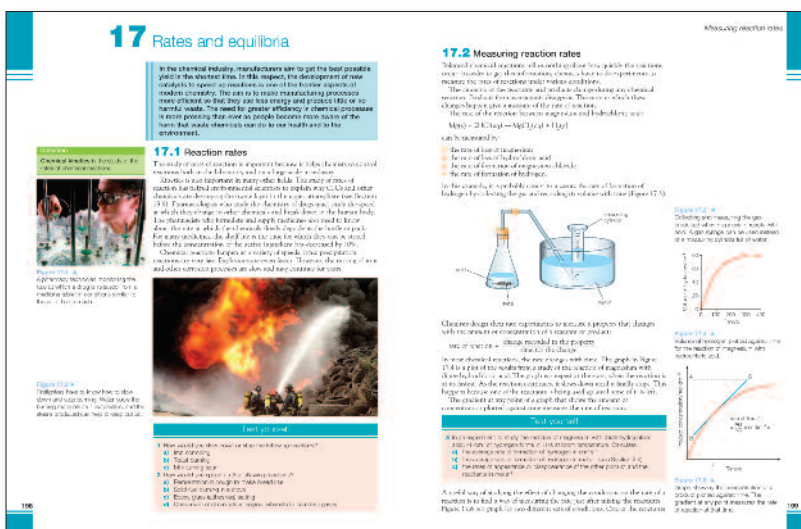
**Dynamic Learning and Assessment Network Edition CD-ROM** includes a bank of resources for the course including video, animations, interactive progress tests, answers to all questions in the Student's Book, practical worksheets with teachers and technician's notes as well as rotatable images of molecules to help students understand their structure.

Also included are:

- **Extension activities** to challenge your most able students
- **Interactive Assessment** to test your students understanding of the topic and to suggest improvements where necessary
- All the **photos and artwork** from the Student's Book
- Introductory **PowerPoint presentations**

## Dynamic Learning Student resources:

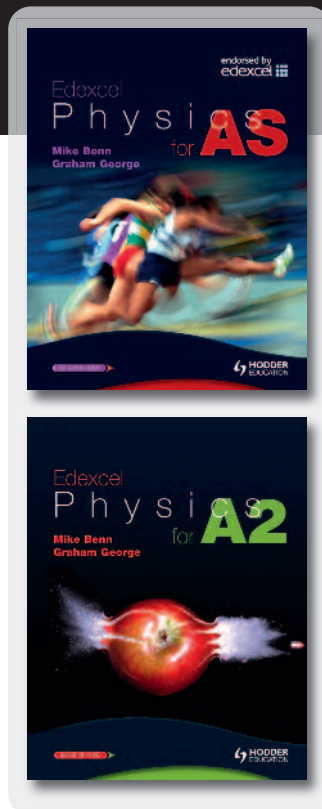
- Included free with every Student's Book
- Enable your students to consolidate their learning at home
- Provide an interactive version of the book enhanced with additional activities and resources to support your students in preparing for their exams
- Guide students through difficult concepts via Personal Tutor presentations
- Provide extension questions to support students aiming for the very best grades
- Include learning outcomes and data tables



A spread from OCR Chemistry for AS Student's Book

Order your class set today – see the order form for some fantastic special offers. Or order your Inspection copies on 01235 827720.

# Edexcel Physics for AS and A2



## About the authors:

**Mike Benn** is an experienced teacher and examiner.

**Graham George** has been a Senior Examiner for over 20 years, and until recently was Vice Principal of Woodhouse College, Finchley.

**Tim Akrill** was Head of Science at Clifton College. He has been a Senior Examiner for A level Physics and was a Deputy Editor of Physics Education.

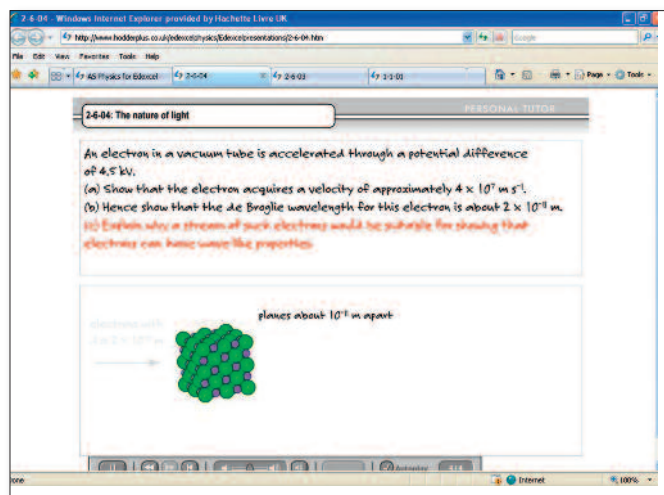
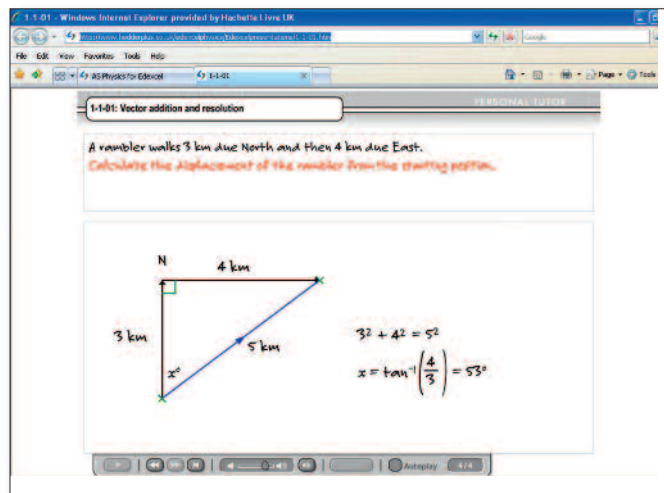


**Edexcel Physics for AS and A2** have been written specifically to cover the concept approach to the new Edexcel specifications. The author team includes experienced examiners and teachers who have worked together to ensure that the material is accessible to students at the start of their course. Our resources are endorsed by Edexcel so you can be sure that they fully meet the requirements of their GCE Physics specification.

## The Student's Books:

- Provide clear worked examples throughout, making difficult concepts as easy to understand as possible
- Includes plenty of practice for the mathematical calculations that students are likely to encounter throughout their course
- Helps students develop essential skills for the examination

**Edexcel Physics for AS and A2** also have **Personal Tutor websites** which contain 45 Personal Tutor resources to support mathematical work and independent study. A wealth of audio-visual resources contain step-by-step instructions on how to tackle mathematical concepts, offering support to students when they are working on their own and allowing them to work at their own pace.

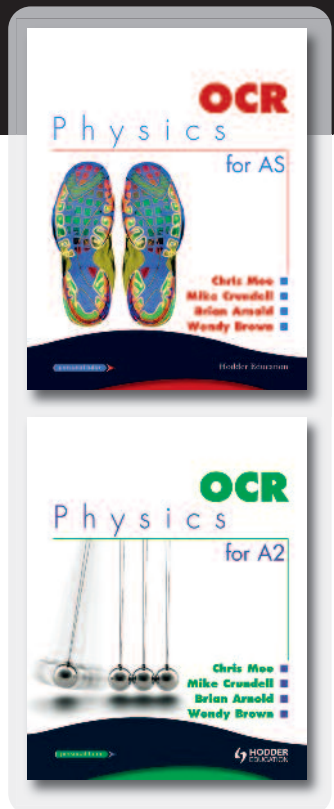


Examples from the Personal Tutor website

Order your class set today - see the order form for some fantastic special offers.  
Or order your inspection copies on 01235 827720.

# OCR Physics for AS and A2

personal tutor



## About the authors:

**Chris Mee** is a Senior Examiner for CIE, Chair of Examiners for Edexcel and Chief Examiner for CCEA.

**Mike Crundell** is a Principal Examiner for CIE (University of Cambridge International Examinations) and author of several Hodder Education and Philip Allan texts.

**Brian Arnold** is an experienced teacher with roles including Head of Physics, Head of Science and Examinations officer and author of a wide range of textbooks, including AS/A2 Physics.

**Wendy Brown** is an experienced teacher and examiner of A Level Physics as well as author of AS/A2 Physics.

**OCR Physics for AS and A2** have been written specifically to cover the revised specifications and are presented so that they are accessible to students who have recently made the transition from any GCSE combined Science course.

## The Student's Books:

- The content of the textbook follows the order of the specification and builds on the topics covered in GCSE
- Include key points, definitions and equations highlighted throughout the text to aid understanding and revision
- Provide assessment questions at the end of each chapter to help students gain a good idea of what is expected of them in the exam

A **Personal Tutor website** is provided to support the Student's Book. 29 resources are included to help your students with mathematical work and independent learning. These audio-visual resources offer support to students when they are working on their own and allow them to work at their own pace.

**8.2 Potential difference**

- select and use the equations  $P = VI$ ,  $P = IR$  and  $P = V^2/R$
- select and use the equation *electrical energy* =  $VQ$
- define and use the unit *electronvolt*
- explain how a fuse works as a safety device.

**Potential difference**

A cell makes one end of the circuit positive and the other negative. The cell is said to set up a **potential difference** across the circuit. Potential difference (pd, or short) is measured in volts (symbol  $V$ ), and is often called the voltage. You should never talk about the potential difference or voltage through a device, because it is in fact a difference across the ends of the device. The potential difference provides the energy to move charge through the device.

The potential difference between any two points in a circuit is a measure of the electrical energy transferred, or the work done, by each coulomb of charge as it moves from one point to the other. We already know that the unit of potential difference is the volt ( $V$ ). Energy  $W$  is measured in joules, and charge  $Q$  is in coulombs.

**potential difference =  $\frac{\text{energy transferred (or work done)}}{\text{charge}}$**

or

$$V = \frac{W}{Q}$$

We can turn this relation round to get an expression for the electrical energy transferred or converted when a charge  $Q$  is moved through a potential difference  $V$ .

**energy transferred (work done) = potential difference  $\times$  charge**

$$W = VQ$$

This relation gives a definition of the volt as

One **volt** is the potential difference between two points when one joule of energy is transferred by one coulomb passing from one point to the other.

In Figure 8.7, one lamp is connected to a 240 V mains supply and the other to a 12 V car battery. Both lamps have the same current yet the 240 V lamp glows more brightly. This is because the energy supplied to each coulomb of charge in the 240 V lamp is 20 times greater than for the 12 V lamp.

---

**8.3 Potential difference, resistance and power**

Figure 8.7 A 240 V, 100 W lamp is much brighter than a 12 V, 5 W car light, but both have the same current. (Do not try to experiment yourself as it involves a large voltage.)

**Example**

Electrons in a particular television tube are accelerated by a potential difference of 20 kV between the filament and the screen. The charge of the electron is  $-1.6 \times 10^{-19}$  C. Calculate the gain in kinetic energy of each electron.

Since  $V = W/Q$ , then  $W = VQ$ . The electrical energy transferred to the electron shows itself as the kinetic energy of the electron. Thus,

$$\text{kinetic energy} = VQ = 20 \times 10^3 \times 1.6 \times 10^{-19}$$

$$= 3.2 \times 10^{-15} \text{ J.}$$

(Don't forget to turn the 20 kV into volts.)

**Now it's your turn**

- An electron in a particle accelerator is said to have 1 million electronvolts of energy when it has been accelerated through a potential difference of 1 million volts. Calculate the energy, in joules, passed by the electron.
- A work bulb is rated 7.2 V, 0.25 A. Calculate:
  - the charge passing through the bulb in one second,
  - the energy transferred by the passage of each coulomb of charge.

**Electrical power**

Remember that power  $P$  is the rate of doing work, or of transferring energy. Remember also that  $V = W/Q$ . Divide each term on the right-hand side of this equation by time  $t$ , so that  $V = (W/t)/Q$ .  $W$  is power  $P$ , and  $Q/t$  is current  $I$ , so

$$\text{potential difference} = \frac{\text{power}}{\text{current}}$$

A spread from OCR Physics for AS Student's Book

Order your class set today – see the order form for some fantastic special offers. Or order your Inspection copies on 01235 827720.

# Dynamic Learning

Find out more at [www.dynamic-learning.co.uk](http://www.dynamic-learning.co.uk)



Solutions for  
• Personalisation  
• Enrichment  
• Whiteboards  
• VLEs

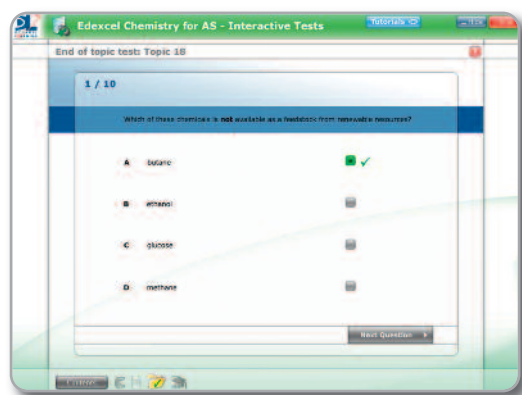
To make your lessons more absorbing and interactive with minimum hassle, look no further than **Dynamic Learning: the ultimate e-learning solution.**

## Dynamic Learning in the Classroom: Network Editions

Dynamic Learning Network Editions are easy to use, so you can just concentrate on your teaching. Digital resources launch directly from the electronic pages of a textbook or from a menu; and you can create simple, customised and professional lessons with our drag-and-drop Lesson Builder.

Dynamic Learning Network Editions provide the necessary curriculum enrichment for students. Lessons explode into life with video clips, audio files, photos and illustrations, web links, animated activities, quizzes and voting activities, helping you to get the most out of your whiteboard.

Dynamic Learning Network Editions also provide ready-made content that you can use to populate your Virtual Learning Environment. All resources are pre-tagged to save you time and provide high-quality materials that can be searched for and shared with colleagues.

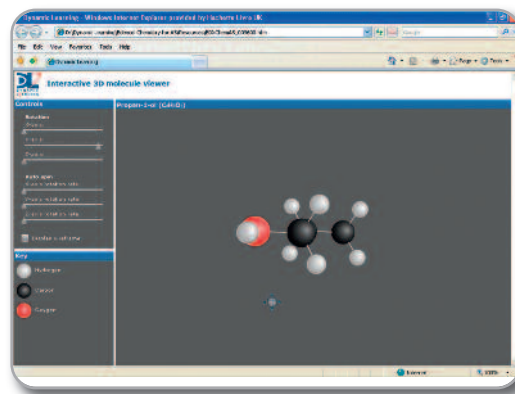


An example of an interactive test from the Edexcel Chemistry Assessment Engine

## Dynamic Learning Outside the Classroom: Student Resources

Dynamic Learning Student resources make home study more enjoyable and support independent learning.

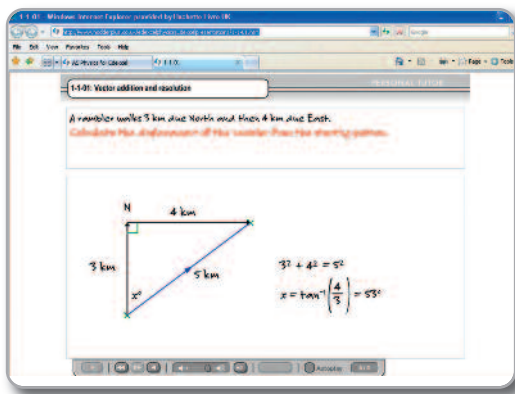
Students can access a range of **free** digital resources to support the content in their textbook, allowing them to personalise their learning experience, enabling them to work at their own level, and helping them to revise effectively.



An example of a rotatable molecule from Edexcel Chemistry

## Personal Tutor

Personal Tutor provides step-by-step commentary on worked examples, reminding students of the processes and methods covered in class. Commentary can be controlled, re-wound and re-played for further clarification.



An example from the Personal Tutor CD-ROM