edexcel
advancing learning, changing lives

Presenting the new 2008 Physics specification plus fantastic new resources.

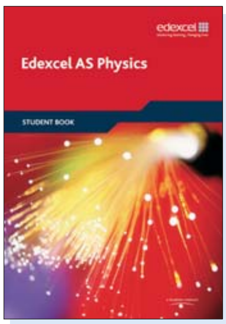
To the Head of Physics

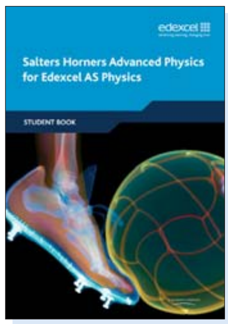
FREE Evaluation Packs!

We're listening and understand that you want:

- **a simple to use specification that gives you the flexibility to teach Physics in the best way for your students** – from September 2008 we'll be offering one Physics specification with two teaching approaches so you can choose the best approach for you. Developed from the best of the Edexcel specifications it gives you the freedom to develop your students' enthusiasm for physics. The Salters Horners Advanced Physics (SHAP) context-led approach is the natural choice for those progressing from How Science Works at Key Stage 4. Alternatively, develop your own approach using the concept-led route also clearly laid out within the specification and resources. Whichever you choose there's just one common exam.

- **support from your examining body at every step** – practical help and advice are readily available from Edexcel. Ask the Expert puts you in touch with senior subject experts to ensure you get answers quickly plus there's a series of "Getting ready to teach" events in 2008 to help you prepare for the implementation of the new specification. Visit **www.edexcel.com/gce2008** for more details.





- **resources exclusively written by experts in physics education for the new specification** – whatever your preferred approach there are teacher assessment and implementation resources and student books available that are right for you. Save valuable time when preparing lessons, and be confident in the knowledge you're covering all the necessary areas. e-Spec, the electronic version of our specification uploads seamlessly into our teacher resources so you're only ever a click away from referencing the specification.

- **to raise achievement** – Mastering Physics provides students with exam and coursework support ensuring they're fully prepared for their assessments. Interactive activities, tests for self-assessment and a host of support for teachers and technicians including frequent opportunities to assess students' progress with real exam questions integrated throughout makes this a must-have resource. Plus our unique Results Plus service lets you see exactly how individual students and classes perform in exams.

See inside for more information on:
- Resources
- FREE Evaluation Packs
- Mastering Physics FREE Trial.

A PEARSON COMPANY

One great new Physics specification, inspiring topics and fantastic resources – all from Edexcel.

The new Edexcel Physics specification has been developed in close consultation with examiners and the project director of Salters Horners Advanced Physics (SHAP). The content provides academic challenge across the ability range and offers you a choice of well-proven teaching and learning styles leading to one common assessment structure. The new specification gives you the flexibility to choose the learning and teaching styles that best suit you and your students.

The two approaches to the content of the specification are:

- **a concept-led approach** which begins with a study of the theories and models of physics and finishes with an exploration of their practical applications.
- **a context-led topic approach** which begins with the consideration of an application that draws on many different areas of physics and then moves on to the concepts underlying this application. This approach is developed by the SHAP project.

Both approaches enable the use of motivating, up-to-date, contemporary contexts and are supported by our own teacher and student resources. You can offer courses based completely on either or both approaches, or 'mix and match' the approaches to different topics within one course. For further information on the new 2008 GCE Physics specification please visit **www.edexcel.com/gce2008** or call **0844 576 0025**.

Teacher and Technician Resources

If you are looking for time-saving resources which help you at every stage throughout the GCE Physics course then the new resources from Edexcel are for you. Both the concept-led and the SHAP context-led approach are fully supported and give you all you need to successfully deliver the new Edexcel Physics specification.

Bring GCE Physics to life with ActiveTeach

ActiveTeach brings the Edexcel specification to life. This amazing digital resource is unique to Edexcel and provides you with a variety of resources which not only grab the attention of your students in the class room but save you valuable time thanks to the teaching support. The ActiveTeach uploads into the e-Spec so you can seamlessly integrate the resources in to your classes safe in the knowledge that the resources are developed by the assessment experts.

The networkable ActiveTeach includes site licences of the ActiveBook, videos, animations, simulation and glossary.

ActiveBook is an interactive digital version of the Student Book with links to additional resources and espec. You can zoom in to any area to focus attention. It is ideal for class discussion and whole-class use.

Order your FREE Evaluation Pack today!
See the back page for details.

Sample screen from the concept-led *ActiveTeach*

Access the ActiveBook - ideal for class discussion and whole-class use.

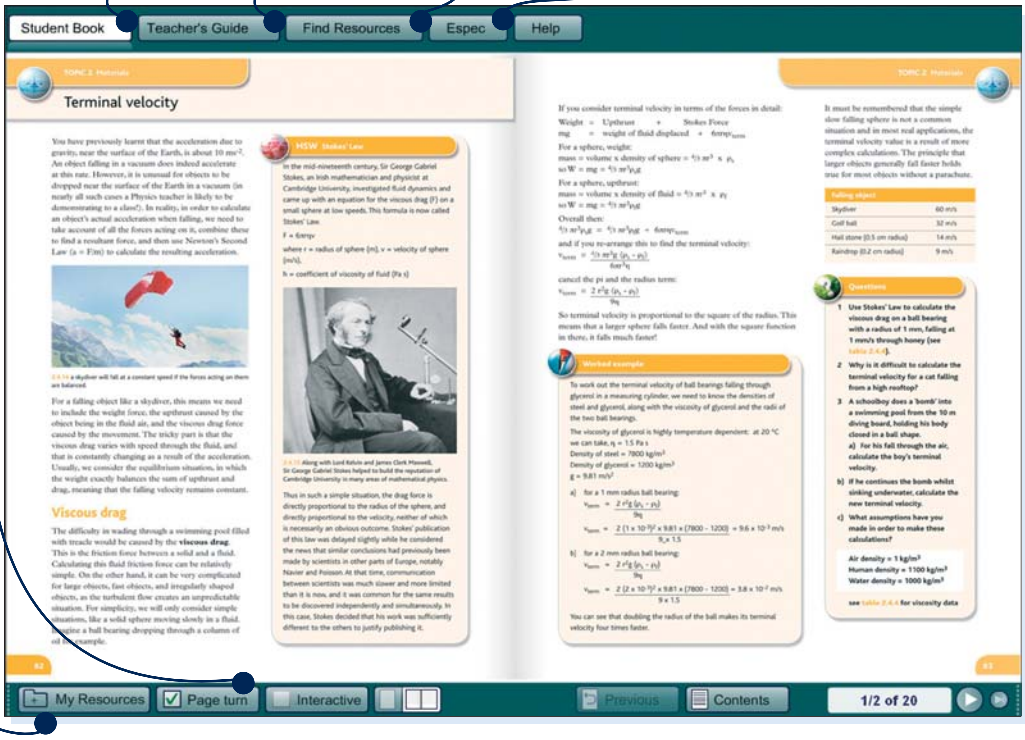
Provides editable sheets for core practicals, teacher notes and revision check lists.

Access a list of all the animations, videos and additional resources on the ActiveTeach for integration in to lessons.

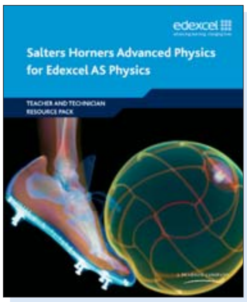
When espec is loaded onto your computer along with ActiveTeach it gives quick access from the ActiveBook to the spec point being taught.

Highlights the interactive resources on the ActiveBook.

'My Resources' helps you personalise the resources provided. You can save, organise and access files quickly and import other files, building up your own customised resource bankt.



Teacher and Technician Resource Pack



Developed for those following the Salters Horners Advanced Physics (SHAP) context-led approach the Teacher and Technician Resource Pack provides valuable time-saving resources to use when preparing your lessons.

This practical, photocopiable, loose-leaf folder includes:

- a full planning scheme that follows the structure of the Student Book
- interlinked lesson plans
- teacher's notes on each chapter
- technician's notes for every practical activity in the course
- student activity sheets together with Additional Sheets which allow students to further explore particular topics
- end-of-chapter tests and mark schemes.

If you are unfamiliar with the context-led approach to physics this new resource provides step-by-step support helping to make implementation easy.

Those following the context-led approach receive unrivalled support from the SHAP team including:

- dedicated support for centres from the University of York Science Education Group (UYSEG) project teams to help with queries
- specialist free training days for centres
- regular updates from the SHAP team
- an e-discussion group where more than 250 teachers experienced in the delivery of SHAP materials participate in the lively online Salters Horners community.

See sample pages overleaf

Sample pages from context led *Teacher and Technician Resource Pack*

Teacher Notes

Teacher Notes provide guidance on implementation of Student Book activities and on teaching each unit as a whole.

Detailed instructions on method help students carry out the activity.

TEACHER NOTES — 2 Musical notes — MUS

Activity 9 Superposition

Activity sheet 9

This activity uses the University of Salford's *Sounds Amazing* software, to show what happens when two simple sinusoidal waves superpose. There are animations and videos to help with the visualisation of some of these ideas. See www.shaplinks.co.uk for URL details.

Activity 10 Standing waves

Activity sheet 10

We recommend that students make these standing waves themselves if enough apparatus is available. Activity sheet 10 gives guidance. When discussing the air column (Kundt's tube) emphasise the fact that the standing waves are set up in the air, not in the material of the tube. Students should find that the distance between cork heaps (which accumulate at displacement nodes) is about half the wavelength of the sound waves travelling in air.

In addition, you might like to demonstrate two-dimensional standing waves (Chladni figures) using a vibration generator to drive a flexible metal plate. As noted in the Student book, such techniques are used to test the performance of musical instruments. You can also produce interesting standing wave patterns in a stiff wire loop driven by a vibration generator.

Standing waves on a string or cord can also be demonstrated using Melde's apparatus. Both the fundamental and the overtones can be demonstrated, including the relationship between the frequencies.

1.6 Summing up Part 1

Activity 11 Describing waves

No sheet

In this summary activity, encourage students to use labelled diagrams to define and explain some of the key terms they have met in this part of the chapter.

2 Musical notes

In this part of the chapter, the emphasis is on notes produced by musical instruments. Additional sheets 4 and 6 supplement the information about wind and stringed instruments given in the Student book. You might like to use these sheets as 'foreground reading' before students work through this section, particularly with students who play musical instruments themselves.

2.1 Wind instruments

Activity 12 Playing a wind instrument

Additional sheet 4

Activity 12 is a reading comprehension activity. Encourage students to skim-read the passage first to get an idea of what is in it and then read the questions so that on a second, more careful, reading they will be able to pick out the important points. Encourage them to use dictionaries for unfamiliar words – this is not 'cheating'!

You might like to distribute Additional sheet 4 either before this activity, or after students have answered and discussed Questions 15 to 20.

If one of your students plays a wind instrument, they could perhaps be asked to demonstrate it to the rest of the group, showing how the sound is generated and how different notes are produced. If you do this, do make sure that the instrument is kept safe, and not handled by other students.

Activity 13 Can your recorder tell you the speed of sound?

Additional sheets 2 and 5

This activity is quite demanding, particularly for less mathematical students, and particularly if they have not had much experience of using graphs to analyse (as opposed merely to record) experimental data.

In answering Question 18 (Activity 12), students should have derived a relationship between the

Student Worksheet

Provides a summary of the activity to be carried.

Activity 13 — MUS

Can your recorder tell you the speed of sound?

Activity

With the help of *Audacity*, measure the speed of sound using a recorder.

Introduction

A recorder is basically an open pipe which, when played in the normal way, develops a standing wave between the open end where you blow and the first open hole below the mouthpiece. The exact locations of the displacement antinodes at each end of the standing wave can be quite difficult to pinpoint, but for this experiment, it is sufficient to take them as the tip of the mouthpiece and the far end of the first open hole (Figure A13.1).

In answering Question 18 in the Student book, you derived a relationship between the length l of an open tube and the frequency f of the longest standing wave that it could accommodate:

$$f = \frac{v}{2l}$$

where v is the speed of sound in air.

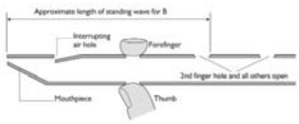


Figure A13.1 The length of an air column in a recorder

Audacity includes a *Spectrum Analyser* that allows you to measure the frequency of a recorded sound. By measuring the frequency of sound produced by a column of length l, you can calculate the speed of sound.

Preparation

Measuring the frequency of just one note would give a crude value of the speed of sound. A much better technique would be to measure f and l for several different notes, and plot a graph.

Questions

1 Sketch the shape of graph you would expect if you plotted (a) f against l (b) f against $\frac{1}{l}$.

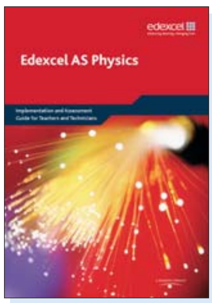
2 What would be the gradient of a graph of f against $\frac{1}{l}$?

- Draw up a table for recording your value of f, l and $\frac{1}{l}$. Take care to head each column with appropriate units.

Necessary resources are listed to help with planning and organisation.

Gives students guidance on the analysis of results.

Implementation and Assessment Guide for Teachers and Technicians



The Implementation and Assessment Guide for Teachers and Technicians provides the concept-led support you need to plan and deliver the practical elements of your science course. Developed by the experts at Edexcel it provides complete coverage of the specification and saves you valuable time by supplying all you need in a practical, photocopiable, loose-leaf folder.

The guide includes:

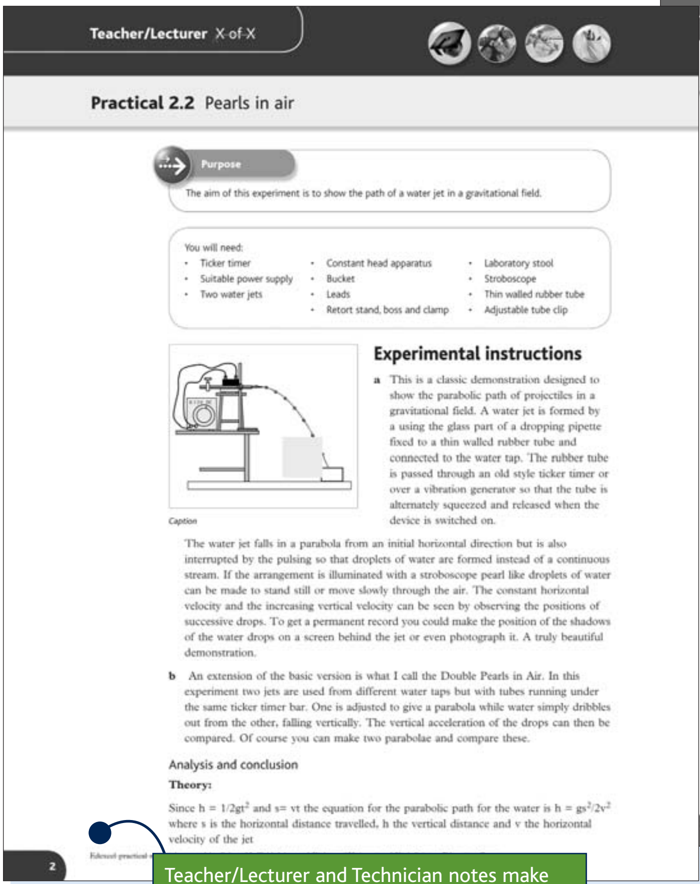
- teacher's notes to support the practical elements of the course
- photocopiable student worksheets for all core practicals helping students develop practical science skills
- technician's notes for preparing class activities helping to make classroom organisation simple and efficient
- the digital version of the guide includes links to e-Spec once uploaded.

Helps you raise achievement through:

- practice Unit tests which use genuine Edexcel past papers to help with progress monitoring and exam preparation
- complete answers for every question and test in the book – to make marking easy.

See sample pages on the next page

Sample pages from the concept-led *Implementation and Assessment Guide for Teachers and Technicians*



Teacher/Lecturer X-of-X

Practical 2.2 Pearls in air

Purpose

The aim of this experiment is to show the path of a water jet in a gravitational field.

You will need:

- Ticker timer
- Suitable power supply
- Two water jets
- Constant head apparatus
- Bucket
- Leads
- Retort stand, boss and clamp
- Laboratory stool
- Stroboscope
- Thin walled rubber tube
- Adjustable tube clip

Caption

Experimental instructions

a This is a classic demonstration designed to show the parabolic path of projectiles in a gravitational field. A water jet is formed by a using the glass part of a dropping pipette fixed to a thin walled rubber tube and connected to the water tap. The rubber tube is passed through an old style ticker timer or over a vibration generator so that the tube is alternately squeezed and released when the device is switched on.

The water jet falls in a parabola from an initial horizontal direction but is also interrupted by the pulsing so that droplets of water are formed instead of a continuous stream. If the arrangement is illuminated with a stroboscope pearl like droplets of water can be made to stand still or move slowly through the air. The constant horizontal velocity and the increasing vertical velocity can be seen by observing the positions of successive drops. To get a permanent record you could make the position of the shadows of the water drops on a screen behind the jet or even photograph it. A truly beautiful demonstration.

b An extension of the basic version is what I call the Double Pearls in Air. In this experiment two jets are used from different water taps but with tubes running under the same ticker timer bar. One is adjusted to give a parabola while water simply dribbles out from the other, falling vertically. The vertical acceleration of the drops can then be compared. Of course you can make two parabolae and compare these.

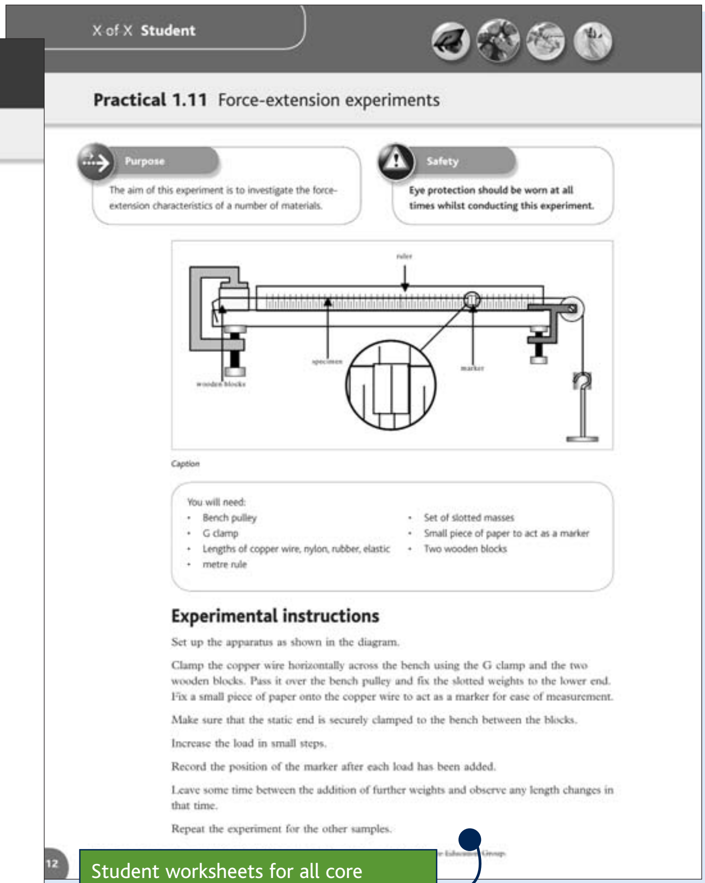
Analysis and conclusion

Theory:

Since $h = 1/2gt^2$ and $s = vt$ the equation for the parabolic path for the water is $h = gs^2/2v^2$ where s is the horizontal distance travelled, h the vertical distance and v the horizontal velocity of the jet

2

Teacher/Lecturer and Technician notes make classroom organisation simple and efficient.



X of X Student

Practical 1.11 Force-extension experiments

Purpose

The aim of this experiment is to investigate the force-extension characteristics of a number of materials.

Safety

Eye protection should be worn at all times whilst conducting this experiment.

Caption

You will need:

- Bench pulley
- G clamp
- Lengths of copper wire, nylon, rubber, elastic
- metre rule
- Set of slotted masses
- Small piece of paper to act as a marker
- Two wooden blocks

Experimental instructions

Set up the apparatus as shown in the diagram.

Clamp the copper wire horizontally across the bench using the G clamp and the two wooden blocks. Pass it over the bench pulley and fix the slotted weights to the lower end. Fix a small piece of paper onto the copper wire to act as a marker for ease of measurement.

Make sure that the static end is securely clamped to the bench between the blocks.

Increase the load in small steps.

Record the position of the marker after each load has been added.

Leave some time between the addition of further weights and observe any length changes in that time.

Repeat the experiment for the other samples.

12

Student worksheets for all core practicals providing complete coverage of the Edexcel specification.

Mastering Physics – personalised tutoring motivating students to success

Mastering Physics – is a simple physics homework tutorial system matched to the Edexcel specification. It provides teachers with the facility to set students homework online to be completed by a specified deadline. Students simply log on to access the site, take tests and continue learning outside the classroom. Mastering Physics is excellent for exam preparation and will help improve your student's performance. 200 million tests taken last year!

Suitable for the full ability class range Mastering Physics provides students with personalised learning and tutors them to success! Students receive feedback generated by the sophisticated Mastering Physics software which understands the process they've gone through to get to their answer and gives them problem-solving hints and tips, praise and motivation as they move through tasks. Helping to raise attainment and understanding.

Try Mastering Physics for FREE! Until 31st August 2008 you and your students can trial Mastering Physics for FREE. Simply see the order form on the back page to order.

Save £50 when you subscribe to Mastering Physics!

Purchase a pack of 10 subscriptions for our special offer price of £100. Saving you £50! There's no use by date, subscriptions only start when you activate them. You will require 1 subscription per student. To place your subscription package order see the order from on the back page.

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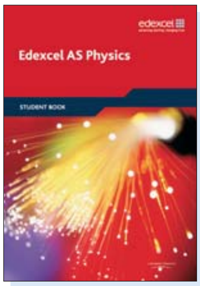
See the back page for details.

Student support from Edexcel

These new resources from Edexcel provide step-by-step coverage of the specification helping students to develop a scientific understanding and prepare for exams. They support a wide variety of activities, including practical work, and ensure students develop a thorough understanding of How Science Works. Both approaches include "ExamZone" sections which provide real Edexcel exam practice questions and allow students to regularly test themselves and prepare for assessment.

Concept-led student resources from Edexcel



Written by Patrick Fullick, one of the best known and experienced authors of A Level Science, this concept-led Student Book provides an in-depth understanding of the principles covered whilst studying a particular topic. It sets out the learning objectives of the class and makes it clear what scientific understanding students will develop as they progress through the activities. Regular opportunities to test their understanding are provided through the "Review Tests" sections.

FREE ActiveBook CD-ROM

The ActiveBook is an easy-to-use digital version of the Student Book with interactive resources available direct from its pages. ActiveBook is an easy way for your students to take materials home for out-of-class study.

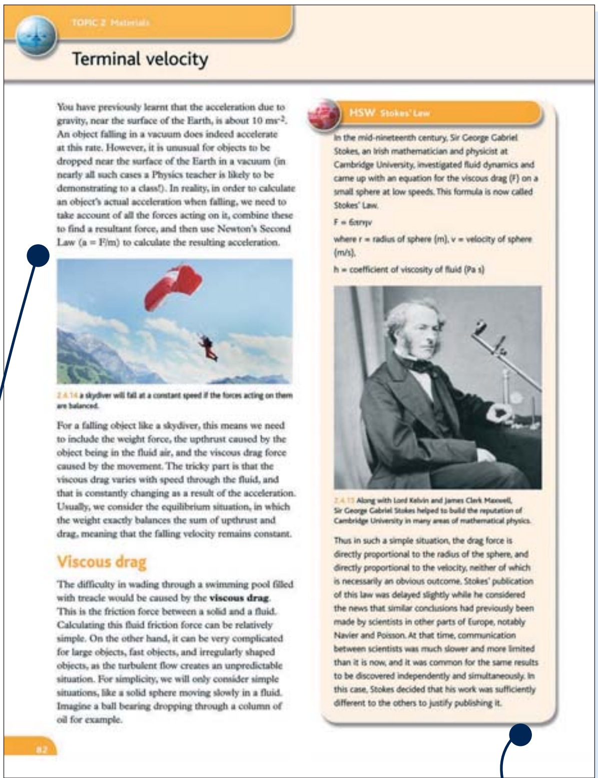
Bold terms are hyperlinked to a detailed glossary in the ActiveBook ensuing key terms are understood. You can zoom in to any area of the ActiveBook to focus attention and it is ideal for class discussion.

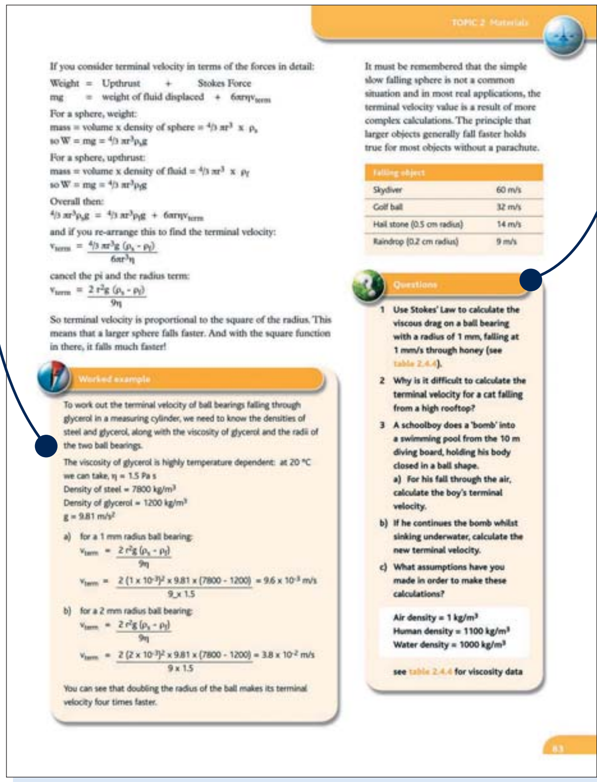
The ActiveBook is available both on the CD-ROM within the concept-led Student Book and as part of the ActiveTeach CD-ROM for whole-class use.

Sample pages from the concept-led *Edexcel AS Physics Student Book*

An opportunity for students to perfect their technique in setting out their answers to exam questions.

Questions to consolidate students' learning. Edexcel exam questions are also included in the book to provide exam practice. Further tests are available in the Implementation and Assessment Guide for Teachers and Technicians.

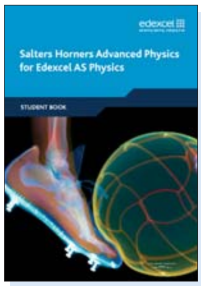




Written to exactly match the Edexcel GCE Physics specification.

How Science Works features help students understand the way in which scientists work and the impact of science on the world.

Context-led student resources from Edexcel



The context-led Student Book has been developed using the SHAP approach and delivers the most relevant and stimulating approach to Edexcel physics. It engages and motivates students by applying physics in real life situations. Students develop a thorough and rigorous understanding of physics concepts and principles through a broad range of teaching and learning activities used in their physics lessons.

The book covers topics that get students interested, use practical and ICT activities, integral scientific, mathematical and key skills are learned and tested. Addresses 'How Science Works' and provides extension and revision materials.

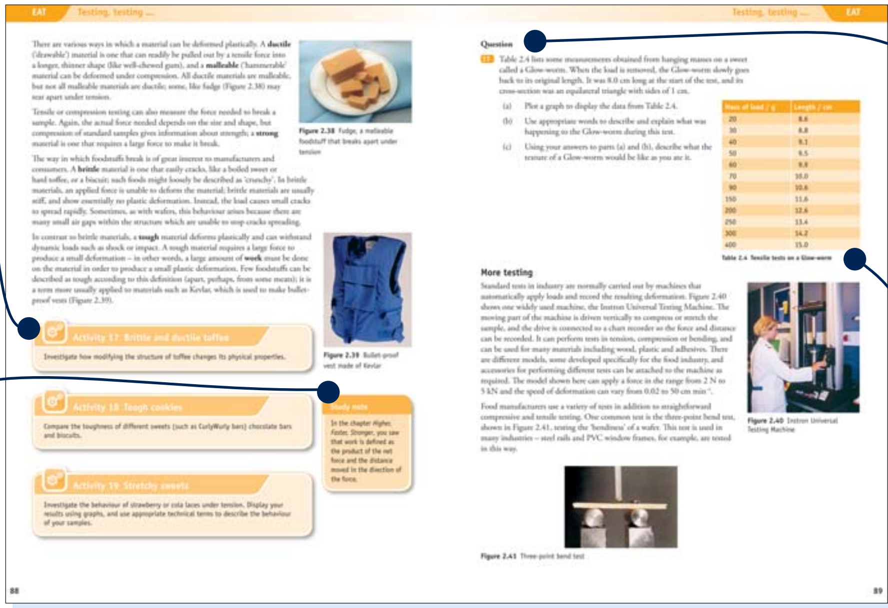
Contexts used:

- Sport
- Food industry
- Spare part surgery
- Music
- Space technology
- Archaeology
- Rail transport
- Telecommunications
- Particle physics
- Building design
- Astronomy

Sample pages from the *Salters Horners Advanced Physics for Edexcel AS Student Book*

Refer to activity sheets covering a wide variety of activities, including practical work, the use of ICT, data handling and discussion. There are activities for both self study and for group study.

Indicates links with other parts of the course, and where further information on particular topics can be found.



These appear throughout the text, with the answers appearing at the end of each unit. There are also questions on the whole unit at the end of each unit, the answers to which appear in the Teacher and Technician Resource Pack.

Refers students to the Maths Notes section at the end of the book, where the mathematics specific to physics is covered in detail.

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Evaluate these resources for FREE by requesting an Evaluation Pack using the order form at the bottom of the page. To place a firm order, simply add the quantity required in the 'Qty' column. Then return this order form (or a photocopy) to our FREEPOST address: **Marketing Department, FREEPOST ANG2041, Harlow, Essex, CM20 2YF.** Alternatively, fax this form to **0870 850 5255**, call FREE on **0800 579 579** or email **customer.orders@pearson.com**. Please quote the reference code above when ordering.

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AS Student's Book with FREE ActiveBook CD-ROM	(1) 978 1 4058 9638 2	£ 19.95	£ 0.35	July 2008		
AS Implementation and Assessment Guide for Teachers and Technicians	(2) 978 1 4058 9639 9	£ 95.00	£ 1.66	June 2008		
AS ActiveTeach CD-ROM	(3) 978 1 4058 9637 5	£495.00	£86.63	July 2008		
Salters Horners Advanced Physics - Context-led resources						
AS Student Book	(4) 978 1 4058 9602 3	£ 24.25	N/A	May 2008		
AS Teacher and Technician Resource Pack	(5) 978 1 4058 9603 0	£150.00	N/A	May 2008		
AS Active Teach CD-ROM	(6) 978 1 40589 601 6	£495.00	£17.50	July 2008		
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Edexcel Salters Horners Advanced Physics Evaluation Pack*	(12) 978 1 4058 8409 9	May 2008	
Mastering Physics Free Trial	(13) 978 0 9978 1190 2	April 2008	

*Each Evaluation pack contains the AS Student's Book, plus samples of the digital- and print-based teacher support.
You can also visit **www.edexcel.com/gce2008** to see preview material.

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