

# Salters Horners Advanced Physics Newsletter

## Autumn 2015

### The SHAP project office

For enquiries about implementing and running the course, queries about course materials – and anything else if you are not sure who to ask – please contact the York project office: The office is staffed by the project director Elizabeth Swinbank and administrator Joanna MacDonal. If we cannot help directly, we will put you in touch with someone who can.

elizabeth.swinbank@york.ac.uk  
joanna.macdonald@york.ac.uk

**Salters Horners Advanced Physics  
Science Education Group  
Alcuin College, University of York  
Heslington  
York YO10 5DD**

<http://www.york.ac.uk/education/projects/>

phone: 01904 322601

### SHAP 2015

Welcome to this latest SHAP newsletter. 2014/15 has been a very busy time for everyone involved with SHAP:

- ◆ Excellent teams of writers, mainly comprising SHAP teachers, have revised and updated the publications for both years of the course.
  - ◆ Editorial, design and publishing staff have worked on all aspects of the materials to ensure their high quality and timely publication.
  - ◆ Examiners and assessment staff have taken the new specification through to final accreditation, including the production of sample assessment materials. They are producing the papers for the first exam sessions of the new spec. They are also producing guidance relating to the new practical requirements.
- ◆ Teachers and technicians have been working to adapt existing schemes of work or introduce new ones. Centres have been reviewing the resources needed to meet the new practical requirements. Many teachers have attended Pearson Edexcel's CPD training events for the new spec.

Many thanks to all those involved.

Inside this newsletter you can read more about the changes to the SHAP course and its publications, and the ways SHAP can help centres address the requirements of the new specification.

### SHAP publications

The materials for Year 1 of A-level were published in Spring 2015, and the Year 2 materials are on schedule for publication this Autumn.

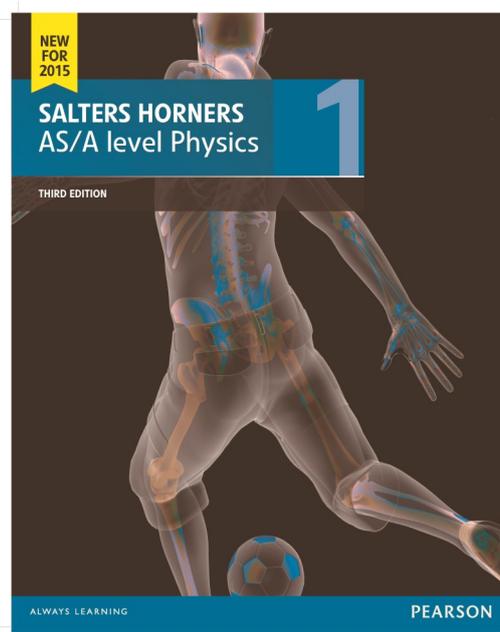
The first year of the full A-level course is also the AS course.

As with previous editions of SHAP, there is a full-colour Student Book for each year of the course, and a parallel Teacher and Technician Resource Pack (TTRP) containing supplementary materials for students as well as information and guidance for teachers and technicians.

There are some differences in how the materials are published:

- ◆ each Student Book includes access to an electronic online ActiveBook, enabling students to personalise the content by adding notes and highlights.
- ◆ each TTRP is supplied as an electronic download comprising pdf and Word files so that the materials may be filed, customised and distributed as needed.

For more details of the new SHAP publications, go to [www.pearsonschools.co.uk/shap2015](http://www.pearsonschools.co.uk/shap2015)



## Revising SHAP for 2015 Revising SHAP for 2015

When revising SHAP to produce the third edition for 2015, the writing and editing teams first had to ensure that the materials address all the requirements of the new specification. They were also able to make some other changes in order to improve the course and keep it up to date.

### Content

The assessable content for each SHAP chapter is listed in both the Student Book and the Teacher Notes (in the TTRP). The table opposite summarises the main changes to the content of the SHAP course.

The new specification includes some new content. In some cases, this is content that students would have met in previous editions of SHAP but was not explicitly assessed. Examples include wave speed on a stretched string (MUS), impulse (TRA), derivation of  $pV = \frac{1}{3} nmc^2$  (STA). These changes to the assessment requirements are not listed in the table as the relevant content is not new to SHAP.

Where completely new content is specified, this has been incorporated into existing SHAP chapters so as to fit with the existing content and context. For example, the principle of moments is fundamental to gymnastics so it is addressed in HFS. Latent heat is covered in BLD where it enhances the section on temperature regulation with an exploration of phase-change building materials.

For the second edition (2008), some of the content in Year 1 had to be relocated in order to match the modular assessment structure, resulting in chapters that were uneven in length and where the context-content link was weaker. In the third edition (2015), much of this content has been restored to its original place (e.g. polarization is now back in EAT).

### Context

The writers have taken the opportunity to refresh and update the contextual aspects of SHAP while still retaining the original chapter contexts. For example: recent sporting records and space missions are referenced in HFS and SPC respectively; SUR includes a new case study on prosthetic limbs; the context of TRA has been updated to include trams and urban light railways; STA uses the recent Rosetta mission to explore gravitational potential in a radial field.

### Maths

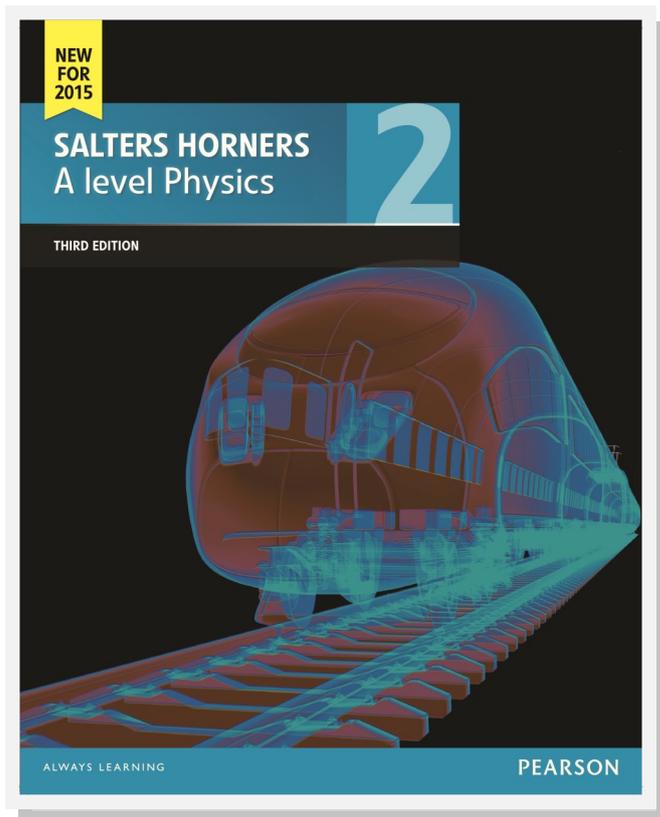
All the new science specifications for 2015 have a greater emphasis on maths. SHAP is in a good position to help centres address these requirements. The Maths Notes in the Student Books, together with the Maths References throughout the chapters, help students to use maths within physics. Additional extension sheets provide extra stimulus for the most mathematical students. For the new edition, writers have included some more mathematical questions and examples.

### Practical work

Practical and other activities have always been a key feature of SHAP. The new specification identifies 16 core practicals (8 in each year) that may be used in written exams for the indirect assessment of practical skills and which will provide evidence for the practical endorsement. Many of these (e.g. determine  $g$  by free fall; investigate the relationship between gas pressure and volume) are well-established SHAP activities. In SHAP, there is no special distinction between core and non-core practicals. All activities are embedded within the course and referenced in the Student Book. All the core practicals, and many non-core, are supported by activity sheets and presented within a coherent framework which is intended to encourage an investigative approach. The TTRPs contain guidance on recording evidence of practical work for the practical endorsement.

### Further information

For full details of all the assessment requirements, refer to the AS and A-level specifications. Also see the Edexcel Pearson website for further guidance and support.



## Summary of the main content changes to SHAP 2015

Chapter	New content added	Content moved in from another chapter	Content moved to another chapter
HFS	Principle of moments	Conservation of linear momentum in 1D from TRA	
MUS			Refraction to EAT Polarization to EAT
EAT		Refraction from MUS Polarization from MUS	
SPC			Pulse-echo to SUR Doppler effect to SUR and STA
DIG			
SUR	Thin lenses and ray diagrams (in original SHAP )	Pulse-echo from SPC Doppler effect from SPC (qualitative)	
TRA	Log equations for capacitor discharge		
MDM	Electical potential; equipotentials Peak and rms values in AC		
PRO	Potential in radial E field Conservation of baryon number, lepton number, strangeness		
BLD	Latent heat and phase change		
STA	Gravitational potential in uniform and radial fields	Doppler effect from SPC (quantitative)	

### SHAPShare

The SHAP website has a page called SHAPShare, where SHAP teachers, technicians and examiners can share resources they have developed for SHAP.

Resources currently available through SHAPShare include diagrams and instructions for making LED-based Planck constant apparatus (with details of coloured LEDs that work well), notes on a real-life archaeological context for measuring resistivity of metal wires, a playlist of YouTube videos that link to SHAP chapters, and a spreadsheet for dice simulation of radioactive decay, as well as several PowerPoint presentations with links to video clips and applets.

To access SHAPShare, go to the SHAP website and follow links to SHAPshare.

If you have developed a SHAP resource that you are willing to share, please email it to the York Project Office as a Word, PowerPoint or Excel file, with a covering email giving a brief description together with your name and that of your school/college.

### Electronic support

#### Teachers

There is a free email discussion group for SHAP teachers, which enables members of the SHAP community to exchange news and views and to receive announcements relating to SHAP.

Joining the group is very easy and costs nothing. Just send a blank email to: [shap.subscribe@yahoogroups.co.uk](mailto:shap.subscribe@yahoogroups.co.uk)

#### Technicians

The Scitech group (established by a SHAP technician) provides free email support relating both to SHAP and to more general tech issues.

To find out more about SciTech, including how to join, go to <http://www.sciencetechnician.com/scitech.asp>

## Top SHAPs 2014

In November 2014, six high-achieving SHAP students received awards from the Salters and the Horners. The prizes were presented at the Salters' annual prize-giving ceremony, held at Fishmongers' Hall as Salters' Hall is undergoing refurbishment.

The keynote speaker, Lord Sainsbury of Turville, spoke of the importance of science education, noting that science can provide a good career that contributes to society and is both exciting and rewarding.

Four students received awards for gaining top marks in the Summer 2014 Pearson Edexcel/ SHAP A-level physics exams. Roland Amoah from Hatch End High School scored an unbeatable 600 UMS marks, followed closely by three SHAP students each with 598 marks: William Crabtree from The Crossley Heath School, Halifax; Kefie Hu from Kendrick School, Reading; Carolyn Rogers from Maidstone Grammar School for Girls. Roland is now studying medicine at Newcastle, while Kefie is reading maths at Imperial College. A further three SHAP students scored over 595 UMS.



In the SHAP AS Unit 3 awards, sponsored by Horners, prizes went to Katy Griffin from the City of London Freeman's School, Ashted, and to Laura Robertshaw, from the Crossley Heath School, for their outstanding work. Katy's project involved finding out about blood viscosity, and determining the viscosity of a fluid (not blood) experimentally; she is intending to study medicine. Laura investigated electrical resistivity and its importance in geophysical surveying. The prize judges were impressed by the mature and complete pieces of work produced by both students.

The upper photograph shows Master Horner Jack Bunyer with (from left) Katy Griffin, Roland Amoah and Kefie Hu. The other three winners were unable to attend the event. As well as a cash prize, the Horners presented each award-winner with a drinking horn: the lower photograph shows Roland receiving a horn from the Master Horner, together with Master Salter Chris Russell (left) and Lord Sainsbury.

Congratulations to all our prize-winners and to all those students who gained their AS and A-level physics qualifications with SHAP in 2014.

2015 is the final AS year of the current specification. We'll be reporting on the 2015 prize winners in the next SHAP newsletter.



## Support from Edexcel/Pearson

Documents relating to Pearson Edexcel AS/A-level physics can be found at:  
<http://qualifications.pearson.com/en/qualifications/edexcel-a-levels/physics-2015.html>  
Edexcel AS and A-level physics assessment is looked after by Richard Hammond and Simona Ondruskova. To contact Richard or Simona please email: [gce.sciences@pearson.com](mailto:gce.sciences@pearson.com)

### Ask the Expert (ATE)

This service directs subject-specific enquiries to the senior subject team at Pearson. To access the service, click on the link from the "Contact Us" page:

<http://qualifications.pearson.com/en/support/support-for-you/teachers/contact-us.html>

This opens up Edexcel Online. You then need to enter your password, and you can then access past questions, or ask a new question.

### Subject Advisors

This service exists to provide a personal point of contact if you still have questions after exploring other contacts and the Edexcel website. Contact the science subject advisor team by phone on 0844 576 0037 or email: [teachingscience@pearson.com](mailto:teachingscience@pearson.com)