

# ASE Scotland Annual Conference 2017



Saturday 4th March 2017 at Harris Academy, Dundee

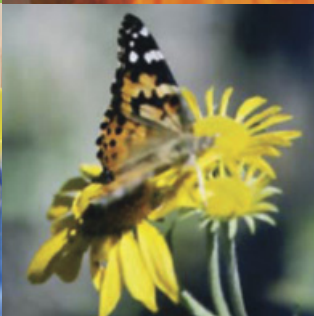
## Conference Preview



Inspiring  
science  
education CPD



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**Up to 50% discount for ASE members**  
**Conference fee from £55.00**

“ Another highly enjoyable, stimulating and inspiring day out. LOADS of ideas to take back to school... Excellent workshops. Lots of useful ideas for use in the classroom yet simply and clearly set out... A great day. Looking forward to using the techniques & practicals with pupils... ”

See [www.ase.org.uk/asescotconf](http://www.ase.org.uk/asescotconf) for up-to-date conference information

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# The Association for Science Education Scotland Annual Conference 2017



**“A really inspiring  
and enjoyable event.  
Thank you!...”**

**Welcome to the ASE Scotland Annual Conference Programme Preview**  
– which also includes the Registration Form on the centre pages.

Yet again I am impressed by the range of quality workshops and talks being offered for teachers of science at primary and secondary level. I am extremely grateful to the individuals and partner organisations for enabling such an excellent value program for what is set to be another busy conference. With so many great ideas and resources to be shared I am sure you will go home loaded up with ways to improve learning of science in your classrooms.

I am particularly grateful to Dundee City Council for hosting the conference in the impressive new Harris Academy on Saturday 4th of March. As ever, I look forward to seeing you there.

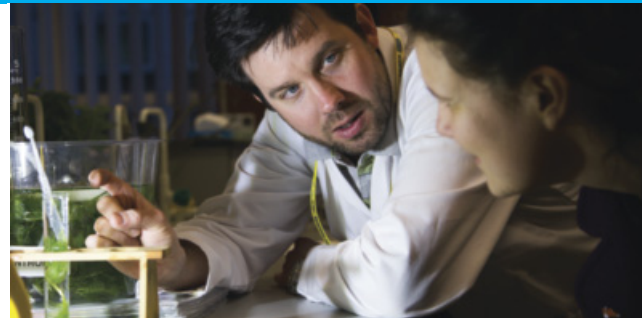
**Tim Browett, Chair of ASE Scotland**

The ASE Scotland Annual Conference is a festival of best practice in science education for everyone with an interest: teachers; technicians; lecturers; trainees; advisors; CPD suppliers and more.

The Conference is open to ASE members and non-members. The ASE Scotland Annual Conference is a magnet for all those passionate about science learning and teaching and always features new and exciting topics.

The ASE Scotland Annual Conference is an outstanding opportunity for you to create a programme of continuing professional development that exactly meets your needs. Many of the sessions will also provide you with free, sponsored resources and equipment for you to take away and use to embed your learning in your classroom.

This year's sessions focus on the topics and courses currently relevant to Scottish teachers such as primary science, the new Higher and Advanced Higher courses and the use of modern technology to promote effective learning and careers in STEM subjects.



The support and professional development you will gain from the ASE Scotland Annual Conference will be acknowledged with a certificate of attendance from ASE which can be added to your CPD portfolio and used towards GTCS Professional Update and ASE Chartered Science Teacher, Registered Scientist or Registered Science Technician award.

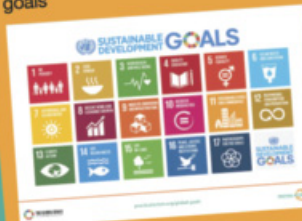
ASE works with many partner organisations to ensure the ASE Scotland Annual Conference delivers the best quality professional development.

## Have you discovered Practical Action's **FREE teaching resources?**

Our primary and secondary material  
will help you deliver the **Scottish  
science curriculum** within a  
GLOBAL context

### Videos, images and posters

Great secondary sources of  
information in a number of areas  
including energy, food and  
agriculture, climate change, water  
and sanitation and the NEW global  
goals



### Science

Enquiry based science activities  
including concept cartoons, Upd8s  
and a document showing where  
resources fit the Scottish science  
curriculum



### STEM challenges

Problem solving, hands on  
challenges including the Plastics  
Challenge, Beat the Flood,  
Floating Garden Challenge and our  
ever popular Squashed Tomato  
Challenge



### STEM Careers

A careers poster and inspiring case  
studies which help pupils see how  
taking STEM subjects can lead to  
a range of careers that really make  
a difference.



Primary and secondary materials  
taking inspiration from Practical  
Action's projects in developing  
countries. Our resources:

- ✓ Are set in real world contexts to engage and inspire pupils
- ✓ Fit the Scottish science curriculum
- ✓ Include lesson plans, pupil worksheets Powerpoints, links to videos
- ✓ Provide secondary sources of information e.g. technical briefs and case studies



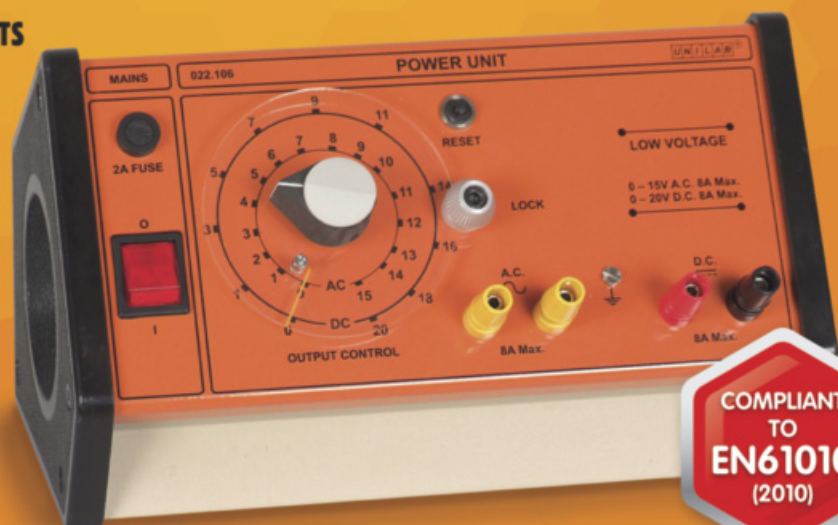
[practicalaction.org/schools](http://practicalaction.org/schools)



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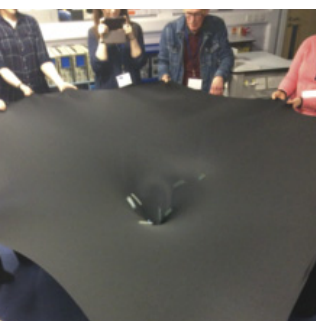
Call: **0345 120 4520**

# Conference Partners:

The ASE would like to thank our conference partners for their support for the ASE Scotland Annual Conference 2017. ASE is proud to be working with:



Harris Academy  
Dundee City Council



'Great for my setting,  
gets kids involved.  
Will definitely use.'





# Programme for Saturday 4th March

Watch out for information nearer the conference date of an informal social gathering to be held in Dundee on the evening before the conference.

## Key to Target Audience Codes:

All	Everyone
B	Biology;
C	Chemistry;
P	Physics
Pr	Primary



Programme correct at time of going to press but subject to change due to unforeseen circumstances.

**‘Good practice and detailed handouts. This will enable more practical uses in class.’**

Prog. Time	Title/Speaker	Target
09:00-09:30	<b>Registration – exhibitions</b>	All
09:30- 10:45	<b>1A Keynote: You're never too young to be a research scientist – Professor Becky Parker MBE, Institute for Research in Schools</b> <p>The Institute for Research in Schools (IRIS) is a UK registered charity, which invites young people to contribute to the forefront of science and technology whilst they are still at school. We encourage and enable secondary schools and colleges to involve their students in authentic research.</p> <p>School students are bold, prepared to take risks and creative. IRIS aims to support teachers, so that they can support their students to make their own discoveries. Through bespoke accredited CPD programmes, downloadable classroom material and dedicated staff we empower teachers across the UK. We are developing this across a number of programmes including space science, particle physics, material science, chemistry, transport, marine science and biomedical science. As well as inspiring the scientists, engineers and scientifically aware citizens of the future, teachers can reconnect with their subject and rise above the constraints of teaching to the test. Many students have published research and are making a difference at the forefront of science and innovation.</p> <p>Professor Becky Parker, Director of the Institute for Research in Schools (Royal Society Kavli Education Medal winner) will outline what IRIS had achieved and how to roll this out much more widely</p>	B/C/P
	<b>1B Forum discussion on science within the new literacy and numeracy benchmarks – Chaired by Susan Burr</b> <p>Come join teachers from schools that have gained the Primary Science Quality Mark and explore ways to deliver quality science experiences within the new literacy and numeracy benchmarks.</p>	Pr
	<b>1C Creative Science: Explore the Importance of Creativity in the Sciences – Christine Angus and Anna Danby, Dynamic Earth</b> <p>Exploring the importance of creativity within the sciences you will discover novel ways to enthuse, inspire and engage your pupils. All activities are easily reproduced in a classroom with every participant receiving a supporting resource pack. Curriculum links abound across the sciences, social studies, maths and literacy.</p>	Pr
	<b>1D Using STEM challenges to engage pupils in science – Julie Brown and Bren Hellier, Practical Action</b> <p>This hands-on workshop will demonstrate how including global contexts into your teaching will engage and inspire pupils. STEM challenges such as the squashed tomato challenge are extremely popular for lessons, STEM clubs, collapsed curriculum and transition. Find out about these and other free resources including Global Upd8s produced with the ASE.</p>	All
	<b>1E Investigating Outdoors: Thinking through outdoor learning – Daniel Moncrieff, FSC Scotland</b> <p>Fieldwork and outdoor learning can be very effective tools in delivering Curriculum for Excellence. This is a practical workshop focusing on techniques to use with students to ensure they are engaged with their learning whilst outside and thinking more deeply about the world around them. The focus will be on science related activities and will include examples of ICT in the field.</p>	All
10:45-11:15	<b>1X Exhibitions – An extended opportunity to check out the exhibitions.</b> <b>Refreshments – exhibition</b>	All All

Programme continued on page 9

# Curriculum for Excellence fieldwork with FSC Scotland

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80% of schools rebook with FSC every year

Hands-on fieldwork in such amazing natural surroundings allowed for a much more enriching and enjoyable learning experience for pupils and staff alike. [Hillpark School](#)

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SCOTTISH ENGINEERING Leaders Award



## IF YOU WERE AN ENGINEER IN SCOTLAND - WHAT WOULD YOU DO? 2016-2017

Over the past **4 years 20,000** primary and secondary school pupils have participated in this programme – it can be completed as a whole class, whole year group or whole school activity.

Pupils will:

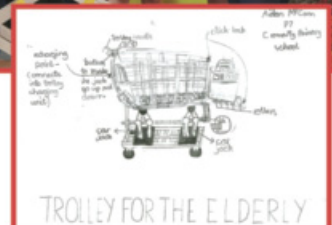
1. Interview an engineer.
2. Identify a problem.
3. Invent a solution.
4. Illustrate and annotate their invention.
5. Pitch a letter to engineers to build their invention.

It will culminate in a grand Award Ceremony and exhibition at The Barony Hall, University of Strathclyde on June 2nd 2017. The Scottish Engineering Leaders Award is a fantastic STEM programme for Scottish pupils, teachers and engineers alike.

Don't delay register **TODAY** at [www.leadersaward.com](http://www.leadersaward.com)

If you would like further information please call **01282 417334** or email [info@leadersaward.com](mailto:info@leadersaward.com)

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Your pupils could inspire engineers to build your invention like Aidan McCann did with this Trolley for the elderly!

Scottish Engineering



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# ASE SCOTLAND ANNUAL CONFERENCE 2017

## REGISTRATION FORM 1

**Confirmations will be made by email,  
please provide a current email address**

**This form must be used – only one person per form**

Title:	First Name:	Surname:
Name to appear on badge:		
Name of organisation to appear on badge:		
Correspondence address:		
Tel. (work)	Tel. (mobile)	Email:
Special diet and /or access requirements:		
Have you been to an ASE Annual Conference before?      Yes <input type="checkbox"/> No <input type="checkbox"/>		
If you are an ASE member please enter your membership number here:		

Please tick all relevant boxes to indicate your main area of interest / employment and subject specialism as appropriate:

Primary ☐ Secondary ☐ Tertiary ☐ Technician ☐ Probationer ☐ Student ☐ Other ☐

Biology ☐ Chemistry ☐ Physics ☐

If employed by a local authority please state which:

**I wish to book the following options from the workshop selection as described on the programme:**

Session 1 ☐☐☐      Session 2 ☐☐☐      Session 3 ☐☐☐      Session 4 ☐☐☐

***\*please select letters for your 1st, 2nd and 3rd choices for each parallel session.***

**Please return both pages of this form together with any cheques and/or purchase orders to:**  
ASE Scotland Annual Conference, c/o Intelligent Events, 126 High Street, Dunblane FK15 0ER  
no later than 20th January 2017 to qualify for Early Bird rates, and 24th February 2017 for Standard rates  
**Enquiries to: [events@intel-events.co.uk](mailto:events@intel-events.co.uk) or Telephone 01786 611 030**  
**Completed forms can be scanned and emailed to [events@intel-events.co.uk](mailto:events@intel-events.co.uk)**



# ASE SCOTLAND ANNUAL CONFERENCE 2017

## REGISTRATION FORM 2

**To qualify for Early Bird rate, your completed Booking form must be received no later than Friday 20th January 2017**

<i>Please tick the appropriate conference fee</i>	Early Bird ASE Member	Standard ASE Member	Early Bird Non-Member	Standard Non-Member
Conference Fee (Sessions 1 to 4)	£55 <input type="checkbox"/>	£80 <input type="checkbox"/>	£110 <input type="checkbox"/>	£135 <input type="checkbox"/>

### NOT ALREADY A MEMBER?

Find out more about the ASE and the benefits by joining the ASE at [www.ase.org.uk/membership](http://www.ase.org.uk/membership)

**Please return both pages of this form together with any cheques and/or purchase orders to:**

**ASE Scotland Annual Conference, c/o Intelligent Events, 126 High Street, Dunblane FK15 0ER**  
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**Completed forms can be scanned and emailed to [events@intel-events.co.uk](mailto:events@intel-events.co.uk)**

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 (Worldpay apply this charge for secure credit card payments)

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# Join ASE

Turn your enthusiasm into inspirational teaching

From local events to national policy, ASE works with you to develop your skills, your career and your professional recognition. Some of our membership benefits include:



## Journals

The ASE's journals offer insights into science education. With articles from expert teachers and technicians, each publication has classroom tips, policy updates, suggested resources and shared effective practice.

 **The Association  
for Science Education**  
*Promoting Excellence in Science Teaching and Learning*

## Professional Recognition

ASE can award its members formal recognition of their skills and expertise as teachers and technicians. Building from Registered Scientist (RSci) to Chartered Science Teacher (CSciTeach) provides a highly regarded pathway for science teachers committed to their subject knowledge and profession.

## Events

ASE has a strong community that organise local TeachMeets where people can share their favourite classroom ideas and Conferences that offer a select programme of CPD sessions. Our flagship event is the ASE Annual Conference which brings together educators from across the UK and further afield to share best practice.

Follow us @theASE and tweet us using hashtag #ASEchat

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membership](http://www.ase.org.uk/membership)

 **schoolscience.co.uk**

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and it's all FREE!**



brought to you by

 **The Association  
for Science Education**





# Programme continued

## Key to Target Audience Codes:

All	Everyone
B	Biology;
C	Chemistry;
P	Physics
Pr	Primary



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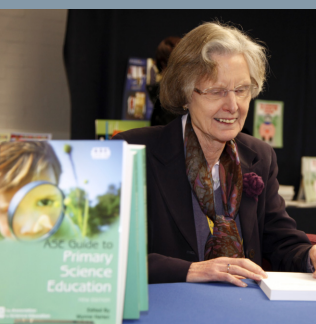
‘Fantastic... motivational... enjoyable... inspiring.’

Prog. Time	Title/Speaker	Target
11:15-12:30	<b>2A Improving Gender Balance Scotland – Heather Earnshaw, IOP</b> In collaboration with Skills Development Scotland and Education Scotland, the IOP are in year 2 of a pilot project investigating ways to identify and address issues around gender imbalances in subject choice and career aspirations. Working with six school clusters the aim is to improve the balance of genders across all subjects, including increased uptake of girls in the physical sciences. This session will explore the emerging findings and recommendations from the project.	All
	<b>2B Language of Mathematics in Science – Richard Needham, LoMiS</b> The Language of Science in Mathematics project was set up to help pupils and teachers overcome some of the mathematical challenges encountered when learning science. The workshop will look at a key area – that of drawing graphs – and will consider some of the challenges, some suggested approaches and resources to support graph drawing skills. The project reports are available for all to download free at <a href="http://www.ase.org.uk/resources/maths-in-science/">http://www.ase.org.uk/resources/maths-in-science/</a>	All
	<b>2C Astronaut Science – National Space Academy</b> Children of all ages love dinosaurs and space. Since the dinosaurs aren't coming back, here's some hands-on, fun space science that also makes you think. A host of, curriculum linked, practical ideas to use in your classroom next week (and next year) that will engage you and your students.	Pr/ All
	<b>2D Practical Parasitology – Mhairi Stewart, University of St Andrews</b> In this workshop we will present some practicals that can be used to engage learners with parasitology and current research in the field. Delegates will take part in these practical sessions with detailed guidance and notes to take away on reproducing them in school with, or without, researchers present.	B
	<b>2E Support for CfE Higher Biology and Human Biology – Kate Andrews, SSERC</b> Within the biology curriculum, at National 5 and Higher it is suggested that learners might use the colour changes of resazurin dye as a measure of respiration rate, or dehydrogenase activity, in yeast. In this workshop we will suggest two methods of generating quantifiable data using yeast and resazurin dye. Workshop participants will receive a CD of resources, including associated data sets.	B
	<b>2F Learn Chemistry Theme Roadshow: Practical Chemistry – Heather Milton and Nicola Jordan, Royal Society of Chemistry</b> With around 4000 free, quality-assured teaching resources, LearnChemistry has activities to support every chemistry course. To help teachers to find exciting new activities, each term we visit schools showcasing a selection of resources linked to a different chemistry theme. Learn about our spring theme of Practical Chemistry.	C
	<b>2G The Sun, The Earth and Global Warming – Martin McCoustra, Heriot-Watt University</b> Global warming is one of the most important issues facing us today. It is also open to question by many who don't understand the physics and chemistry. Only by clear exposition of the issue and the underpinning physics and chemistry can we start to address this problem and its potential impacts on the Earth.	C
	<b>2H CERN@school – Laura Thomas, Institute for Research in Schools</b> Through the Institute for Research in Schools you are able to borrow a Medipix detector based on CERN technology. This session will give you examples of where it can be used in the curriculum and discuss how to get your students involved in carrying out their own investigations. This technology is used in many different areas and is currently deployed on the ISS where it is used for radiation environment monitoring and this data has been made available through our partners at NASA.	P
	<b>2I Particle Physics Revisited – Perimeter Institute &amp; Institute of Physics</b> This session includes a new series of activities to help teach the Particle Physics sections of Higher and Advanced Higher Physics.	P
	<b>2X Exhibitions – An extended opportunity to check out the exhibitions.</b>	All

# Programme continued

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All	Everyone
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Prog. Time	Title/Speaker	Target
12:30-13:00	<b>ASE Scotland AGM</b>	All
12:30-14:00	<b>Lunch – exhibitions</b>	All
14:00-15:15	<b>3A Let's Talk - Teresa McErlean, SSERC</b> An introduction to a new resource, "Let's Talk – Bogs", which aims to help teachers highlight and discuss some environmental science issues relating to preservation of peat bogs with their pupils. Whilst written for pupils at CfE second level it could be modified to be used with younger pupils.	Pr
	<b>3B Learning from dissections - Dundee Science Centre</b> Learn the skill of dissection! This hands-on session will introduce Dundee Science Centre's new dissection workshops for Primary or Secondary, explain how the new £1.7 million Medical Science & Technology exhibition can help your pupils, and give everyone the chance to perform a lung dissection and a plant dissection.	Pr/B
	<b>3C Does Maths Count? - Fordyce Davidson, University of Dundee</b> Contrary to the preconception that mathematics is purely designed to torture school pupils and has no relevance to the "real world", Professor Fordyce Davidson will discuss how mathematical tools are being used to address some of the most fundamental challenges facing mankind today.	All
	<b>3D Camouflage Hiding in Plain Sight – George Lovell, University of Abertay</b> Animals have evolved in many ways to conceal themselves from watchful preying eyes, often through camouflage. Dr Lovell, a psychologist at Abertay University, will show examples of the various types of camouflage in nature and will offer speculations on what visual processes they may be trying to disrupt.	All
	<b>3E Assignments, Projects and Fieldwork – Daniel Moncrieff, FSC Scotland</b> A practical workshop on setting up fieldwork options for Advanced Higher biology and National Assessments in biology. Different fieldwork investigations will be discussed and explored in this hands on session, which will relate these investigations back to assessment criteria.	B
	<b>3F All Singing, All Dancing Biology: Richard Spencer, Middlesbrough College and finalist of The Global Teacher Prize</b> Back by popular request! Biology songs and dances engage students and help to bring complicated language, structures and processes to life. Songs include The Heart Song and "It Had to be U, Uracil U". Dances include DNA Boogie, Mitosis Mamba, Aerobics Respiration and Meiosis Square Dance. Use these, or be inspired to create your own!	B
	<b>3G Actually it is Rocket Science – the chemistry of combustion: Judith Green, National Space Academy</b> Think rockets, think explosions, think chemistry! Through demonstrations and hands-on practical work, this workshop uses rocketry to develop the key chemical ideas about combustion and equations.. If you thought rocketry was all about physics, think again.	C
	<b>3H Get Energised: Renewable Energy Resources near you! – Sarah Cowie, National Museums Scotland</b> This hands – on session introduces teachers to National Museums Scotland new renewable energy outreach kit (launching at the conference). During the session you'll find out about current trends in the renewable energy industry, try the equipment, and discover how it, alongside our online resources, can fit into your classroom teaching.	P
	<b>3I Relativity and Black Holes – Perimeter Institute &amp; Institute of Physics</b> This session includes a new series of activities to help teach the Particle Physics sections of Higher and Advanced Higher Physics.	P
	<b>3J Time-Saving Tips for Science Teachers – Sally Weatherly, Guzled</b> Being busy has almost become the norm in teaching. Our job description expands as we deal with curriculum changes, pastoral responsibilities, extra-curricular events, etc. Join this workshop to learn time-saving tips, collated from teachers all over the world, to help you in your teaching.	All
	<b>3X Exhibitions –An extended opportunity to check out the exhibitions.</b>	All



# Resources for teachers of physics

Discover how the Institute of Physics can support your physics teaching and enhance your career

- Free CPD workshops, conferences and events through our Physics Teacher Network
- Schools and Colleges Affiliation scheme
- SPUTNIK – an online community for physics teachers in Scotland
- Resources for the classroom
- Stirling Physics Meeting
- Physics Teachers' Summer School
- Improving Gender Balance Programme
- Career guidance information

Visit [iopscotland.org/education](https://iopscotland.org/education) for full details of our support or email [gordon.doig@iop.org](mailto:gordon.doig@iop.org)



# Programme continued

## Key to Target Audience Codes:

All	Everyone
B	Biology;
C	Chemistry;
P	Physics
Pr	Primary



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‘Excellent session presented with enthusiasm..’

Prog. Time	Title/Speaker	Target
15:15-15:45	<b>Refreshments – exhibitions (and announcement of the Exhibitor Competition winners)</b>	All
15:45-17:00	<b>4A Science with mobile devices – Richard Needham, ASE</b> Mobile technology provides an easy way to create, store and use media for learning science. In this hands-on workshop you will have opportunities to develop your own skills and consider how the use of technology could support learning in your classroom. You can choose one or more activities from the following topics: Creating video instructions for complex equipment; Producing time lapse video sequences; Using stop motion animation to assess understanding; Using virtual reality for immersive learning experiences	All
	<b>4B Space for Learning; linking to Tim Peake’s mission – Laura Thomas, ESERO</b> Tim Peake spent six months on the International Space Station and is the first British ESA Astronaut to visit. Space can act as an umbrella for all sorts of different topics. This session will introduce a variety of freely available Primary level resources linked to Tim Peake’s mission.	Pr
	<b>4C Chemistry in the Primary School – Susan Burr</b> There will be a range of hands-on activities, developed with the support of an RSC Outreach Grant, to support both the formal and informal part of Curriculum for Excellence. There will also information about the activities and planning of the showcase days which allowed P6/7 pupils to present science activities to their peers, parents and other visitors to school.	Pr
	<b>4D Science careers in the food and drink industry – Jonathan Wilkin, Abertay University</b> The food and drink industry recruits large numbers of skilled food scientists. With an estimated 17,000 expected to retire in the next 20 years there will be high demand for those with a scientific background to come into the industry. Dr Wilkin has a wealth of experience in the peanut industry and working with Scottish companies, where he is currently involved in food innovation.	All
	<b>4E Secondary workshops at Dundee Science Centre: Medical Science &amp; Technology – Dundee Science Centre</b> This hands-on workshop will showcase our new curriculum-linked workshops for Secondary schools, to accompany Dundee Science Centre’s new Medical Science & Technology exhibition. Try activities including gel electrophoresis (e.g. Higher Biology or Human Biology), and discover what else our exhibition can offer your pupils.	B/P
	<b>4F Bangs, Batteries and Barbie – Adrian Allan, Dornoch Academy – supported by RSC</b> This session will demonstrate how microscale chemistry techniques can be used to demonstrate chemical concepts such as pH indicators, molar volumes, gas properties, conductivity, gravimetric analysis and precipitation. A Barbie doll will also be given a detox session in the name of science education.	C
	<b>4G A Fistful of Physics – Gregor Steele, SSERC</b> With more and more schools buying sets of tablets and others encouraging children to “bring your own device”, the SSERC physics team has been looking at apps that can be used for practical physics. We’ve even developed our own. Here we showcase a selection that we believe can enhance learning from S1 to 6.	P
	<b>4H Astro Academy: Principia – Andrew McDonald, National Space Academy</b> As part of Tim Peake’s legacy of his time aboard the International Space Station he performed and recorded a series of educational experiments under the guidance of the National Space Academy. These simple demonstrations illustrate fundamental aspects of science and results in micro-gravity can be compared with those in classrooms. The physics demonstrations cover topics such as circular motion, collision physics, kinetic theory of gases and harmonic motion.	P
	<b>4I Book into Science! Encouraging children to read science for enjoyment – Ruth Jarman, Queen’s University Belfast, with Jennie Hargreaves and Gill Arbuthnott</b> Each year, scores of science information books are published many of which have the potential to excite the interest of children and young people and extend their knowledge. However promoting science reading for pleasure is rarely a specific aim of our primary or secondary science programmes. This session presents a wealth of classroom activities designed to encourage 8 – 14 year olds to read science for enjoyment, thereby enhancing their science knowledge and developing their literacy skills.	All



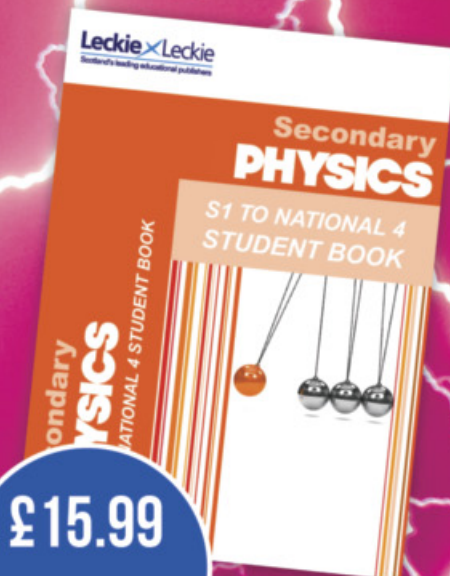
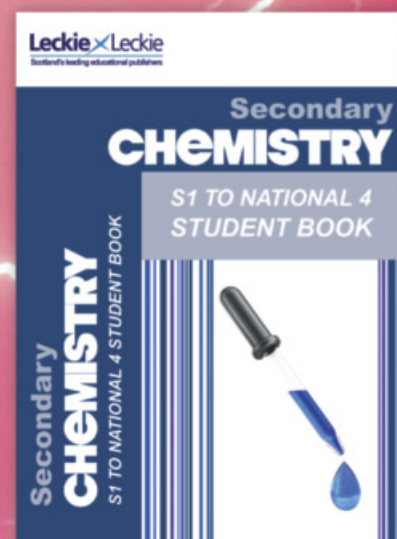
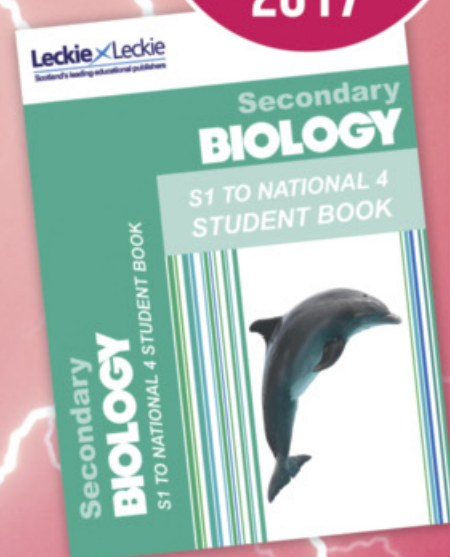
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