

National News

Spring 2012

Achieving excellence in challenging times

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If you are reading this newsletter at the Association for Science Education Annual Conference 2012 then you may already have participated in one of the sessions focusing on the conference's theme: "Achieving excellence in challenging times". The approach of the Stimulating Physics Network is to offer imaginative ways of creating practical physics demonstrations that will inspire and engage your students without needing expensive equipment or materials. At the ASE Conference, our team of Teaching and Learning Coaches and Physics Network Co-ordinators are running an extensive programme of workshops, lectures and drop-in sessions offering effective and economical practicals that can be used by all teachers of physics, both specialists and non-specialists. These sessions include:

'Toys in Physics' takes a playful approach to teaching physics, using just ten toys to explore topics such as electricity, forces and pressure; providing an engaging way of introducing 11-14 year olds to core concepts in physics.

Our **'make and take'** workshops use equipment that is easy and cheap to use in class such as plumbing parts, paper and sellotape to create a rocket launcher or a dragster racing car that are powered by compressed air. Students can alter the designs of their rockets and cars to explore the effect of forces through friction, weight and balance.

'What Happens Next' presents a series of simple practical activities which can be used as starters or prompts for revision. Each demonstration presents a puzzle with a range of possible outcomes which have the potential to surprise and engage pupils. The activities are deceptively simple. They encourage discussion and, while brief, have enough scope to lead to lengthy investigations at a higher level.

These are just a few of the sessions the Stimulating Physics Network is running at the ASE Annual Conference and offers throughout the year, free, to all teachers of physics. The Physics Network Co-ordinators (PNCs) in your region will have workshops already



organised this term which you can book to attend or, if you can bring together teachers from a few local schools, the PNC can organise a bespoke session for you.

To find out what your local PNCs have already planned view your region's page at stimulatingphysics.org

You can view a fuller list of the workshops the PNCs can offer at iop.org/workshops. This is not a complete list as each PNC draws on their own experience as full-time physics teachers to develop sessions that use their particular expertise and enthusiasm. You can get in touch with your local PNC directly (see the regional section in this newsletter) or contact the External Liaison Officer who co-ordinates all the Stimulating Physics Network activity in your region; their contact details are on the back page.

Propelling physics teaching into the future

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The Stimulating Physics Network is a government-funded project run by the Institute of Physics and the National Network of Science Learning Centres. Our aim is to improve the take-up of A-level physics by offering free events, resources and activities to support teachers and inspire students in secondary schools across England.

Find out
more online:
[stimulating
physics.org](http://stimulatingphysics.org)



Why choose physics?

The aim of the Stimulating Physics Network is to increase the number of students opting for physics post-16. Most of our work is done with teachers, to give you the confidence, skills and knowledge to engage your students with physics. Our Physics Network Co-ordinators (PNCs) run workshops for teachers from across the region to attend; while our Teaching and Learning Coaches (TLCs) work with individual schools (known as SPN Partner Schools), going into science departments to support the whole team. When working this closely with a school, a TLC can get involved directly with students to help further inspire them with what physics can offer. One of our TLCs recounts a recent experience at one of the schools he is working with:

“So why choose physics? This simple question brings the focus onto careers in physics – and led to a request from one of my Partner Schools to talk to Year 10 students about careers. After some discussion, the decision was to plan and try a session which looked at two answers to the question ‘Why Physics?’ The answers are “because it’s fascinating” (not always obvious to students or, indeed, all teachers) and “because you’ll earn more money!” The session incorporated two parts. The first was based on the workshop ‘What Happens Next?’ – a series of short quick puzzles with unexpected outcomes. The second was ‘spot the non-physicist’, looking at several sets of three people with very diverse careers. This shows that an A-level or degree in physics can take you anywhere from the City of London to the editor’s chair of a Woman’s Magazine – all a far cry from the stereotypical ‘scientist in a white coat’. “As ever, the impact of events like this is difficult to measure – but one girl after the event did make a point of reporting back that it “had changed her mind about physics.” In a good way we hope...”

There is a growing wealth of students resources offering real-life examples of the opportunities studying physics can offer. A good starting point is the website created by the Institute of Physics, physics.org, which has an interactive resource designed for students to use to explore where physics can take you in media, medicine, law, architecture and other possible paths. Visit: physics.org/careers

If your students and your department would benefit from the direct support of one of our TLCs then get in touch with your local External Liaison Officer to see if you can become an SPN Partner School. See the back page for contact details.



Sparking discussion

If you want to talk about physics then head to talkphysics.org. This online community is open to all teachers of physics to pose questions, share resources or just bat a few ideas around. Currently there is a post about physics sayings and teachers have been sharing what adorns their classroom walls:

“If it squirms, it’s biology; if it stinks, it’s chemistry; if it doesn’t work, it’s physics; and if you can’t understand it, it’s mathematics.” Magnus Pyke

“Imagination is more important than knowledge.” Einstein

“All science is either physics or stamp collecting.” Rutherford (just before getting the Nobel Prize for chemistry!)

“If it disagrees with the experiment, it is wrong.” Feynman

As one of the contributors says: “Maybe not the best, but they have sparked a few discussions.” And that is the philosophy behind talkphysics.org. You do not need to be an expert or have all the answers to post on the site, just share your thoughts, queries or experience and you will connect with our specialist Teaching and Learning Coaches, the expert IOP in-house team and other teachers in the community, so you can get advice, practical ideas or just some understanding from people in the same situation.



→ To get talking, register free at talkphysics.org

Make the Olympics a winner for you

It may seem that everything from burgers to cars is being branded with the Olympics in an attempt to cash in on the build-up to this summer’s event. Cynical as this may appear, it would seem short-sighted of us to not help you make use of the national excitement to engage your students with the science behind the games. Therefore, an invaluable range of resources has been created by respected science education organisations to help you use the Olympics as a springboard to capture your students’ interest.

The Institute of Physics Schools and Colleges Lecture Tour 2012 - Physics and the Games: a winning formula

Utilising our knowledge of Newtonian physics to improve sporting performances is nothing new and is often controversial, from drag-reducing swimsuits and running prostheses to the latest in pervasive sensor technology. “Physics and the Games: a winning formula” will cover many of the key technologies that have allowed athletes to push the boundaries of human performance and will ask where the future might take us. Has perhaps science gone too far in the quest for sporting success?



The free lecture will be presented by researchers from Sheffield Hallam University’s world-leading Centre for Sports Engineering Research (which provides technological support for many Olympic teams) and will involve hands-on demonstrations, live experiments and multimedia elements. Dr David James was the IOP’s Schools and Colleges lecturer in 2004 and the Royal Academy of Engineering’s first Public Engagement Fellow in 2009. He is joined by early-career researchers, Heather Driscoll and Leon Foster who both have undergraduate degrees in sports engineering from the University of Bath and are currently in the process of completing their PhDs. Leon has been modelling the impact of technology on athletic performance and Heather has focused on understanding the traction of football boots.

This lecture lasts an hour and it is suitable for those aged 14 and over. It will be touring the UK throughout 2012. Although the lecture is free, places must be pre-booked with the chosen venue.

For more information and to book, visit: iop.org/schoolslecture

The Wellcome Trust: In the Zone

In the Zone focuses on the human body in sport... How do athletes move so fast or jump so high? How do they get ‘in the zone’, and what happens inside our bodies and minds when we take part in sport, performance or dance? The Wellcome Trust has created free experiment kits so that students of every age can carry out practical experiments to discover for themselves what a body does as it battles with the fundamental physics principles of gravity, forces, energy and motion. A free experiment kit will be sent out to every school early this year and a website offers further activities and teaching resources.

For more information visit: getinthezone.org.uk or email: inthezone@wellcome.ac.uk

STEMNET: STEM Challenges

The STEM Challenges are ten activities that have been inspired by London 2012 to actively engage students with the science, technology, engineering and mathematics (STEM) aspects of the games.

Each challenge is a competition that focuses on a different aspect of the preparations or the event itself and so provides a contextual and cross-curricular approach to studying the STEM subjects at 11-14. We are currently up to Challenge 9: The Paralympic Torch Relay Challenge, for which students need to design a spectacular human-powered invention for creating the spark which lights the Paralympic Flame. You can enter a team of students to compete in the STEM Challenges nationally or you can use the ideas and free resources from any of the current or past challenges to engage your students in class or after-school club.

To find out more visit: stemchallenges.net

→ To get you students engaged with more real-world physics visit: physics.org

► Get in touch

To get connected with the Stimulating Physics Network contact your regional External Liaison Officer. They will be able to give you details of events and courses happening across your region. If you want a workshop on a particular

day then you could create a cluster group with two or three other schools and look to organise a session with a Physics Network Co-ordinator for a day and time that suits you. Contact your External Liaison Officer to find out more.

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To keep up to date with what workshops and events are being planned for your area visit: stimulatingphysics.org and select your region.

Although the listings are split into regions there are no boundaries to our support, so if, for example, you work in London but find it easier to get to one of the East of England events then just contact the relevant PNC or ELO and book yourself a place.

As well as listing our free CPD events, the regional pages include details of sessions at your local Science Learning Centre. You can also attend an exciting programme of CPD through the many residential courses at the National Science Learning Centre in York. For details visit: sciencelearningcentres.org.uk/centres/national

Summer Schools

These annual events for teachers from SPN Partner Schools offer an intensive four days of physics. Our team of Teaching and Learning Coaches deliver sessions to enhance your knowledge, increase your confidence and send you back to school for the new term energised and enthused to inspire your students with physics.

More information will be sent out this term but put the dates in your diary:

York: 24 – 27 July | Oxford: 23 - 26 August

