



Transforming lives through education

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## Focus on Science

### PISA results highlight need for policy changes

The Programme for International Student Assessment (PISA) is an international survey of over 70 countries that evaluates education systems based on tests taken by 15-year-old students. The Organisation for Economic Co-operation and Development (OECD) administers these tests every three years.

This month the results of the 2015 PISA were published<sup>1</sup>. Science was the major focus of the survey for the first time since 2006. The results allow educators and policy makers to identify effective policies that they can adapt and use in their own countries.



Students participate in a Kusuma Sutton Scholars Science event at York University  
Photo: Sutton Trust

Key findings include:

- In the majority of countries, Science performance in the PISA remains unchanged since 2006 despite significant changes in Science and Technology over this period. A few countries showed an improvement in Science performance, including Singapore, Macao, Portugal, Qatar, Peru and Columbia.
- Students from 'advantaged' countries are more likely to pursue a career in Science. On average 25% of boys and 24% of girls reported that they expect to work in a Science-related job when they leave education. Girls saw themselves working more in health related professions, with boys favouring roles as scientists, engineers or ICT professionals.

- Only 8% of students across the participating countries were classed as top performers in Science. Top performers are those able to apply knowledge creatively and autonomously to a wide range of situations.
- Most students who participated in the PISA expressed a broad interest in Science and the important role that Science plays in the world. Despite this only a small number of students reported that they regularly participate in Science related activities.

The OECD concludes that the results of the survey show a clear need for changes in policy to improve Science learning and increase awareness of Science related careers. Parents and teachers should do more to challenge stereotypes associated with Science so students reach their full potential. Additional support for students to become more aware of the range of career opportunities through knowledge of Science and Technology is important. Students who struggle to understand Science concepts should receive additional support to develop a lifelong interest in Science. In this age of ever-developing technology it is vital that students are given more opportunities to learn about Science.

*'An understanding of Science and Science-based technology is necessary not only for those whose careers depend on it directly, but also for any citizen who wishes to make informed decisions related to the many controversial issues under debate today. From maintaining a healthy diet, to managing waste in big cities, to weighing the costs and benefits of genetically modified crops or mitigating the catastrophic consequences of global warming, Science is ubiquitous in our lives.'*

PISA 2015 Results (Volume I), Excellence and Equity in Education

The Kusuma Trust UK (the Trust) inspires young people to study and engage with Science. The Trust's programmes provide opportunities for students to study Science at university, access advice on how to enter Science-related employment and enjoy Science lessons. The Trust supports teachers with professional development opportunities to discover new ways to teach Science. Examples of Science programmes the Trust supports are described overleaf.

1. <https://www.oecd.org/pisa/pisa-2015-results-in-focus.pdf>

## GIBRALTAR

### Kusuma Trust Science Week 2016

On 21-25 November 2016 the sixth annual Kusuma Trust Science Week took place in Gibraltar in partnership with the Science Museum<sup>2</sup>. This year 2,500 students aged 7 to 14 years participated in practical demonstrations, experiments, group activities and live interactive Science shows.

Students from Key Stage two (aged 7-11 years) attended live shows to learn about the human digestive system and the material world. Students witnessed practical demonstrations such as 'It takes guts' allowing them to understand how the human body digests food, the benefits of eating a balanced diet and the impact certain food groups have on the body. Students also learnt about what the world around them is made of and the difference between elements, compounds and molecules. This included practical demonstrations on setting fire to flour and the experiment 'how to make a jelly baby scream!'



A Science demonstration at the Kusuma Trust Science Week  
Photo: Science Museum

Key Stage three students (aged 11-14 years) from Westside, Bayside and Prior Park schools participated in practical learning activities during visits by the Science Museum team. This included a group challenge of how to transport water using only a funnel, bamboo canes and basic stationery.

The Kusuma Trust Science Week gives students an opportunity to learn in a new and exciting way that brings Science to life rather than just learning from a textbook. Darren Grech, Senior Education Adviser for the Department of Education in Gibraltar said:

*“Museums are often associated with history but the Science Museum presentations are sure to inspire the younger generation to develop their enjoyment of Science.”*

## UK

### Science student encourages others

The Kusuma Sutton Scholars programme<sup>3</sup> supports young people from the former UK coalfield regions to boost their aspirations and academic performance. As part of the programme students visit universities, participate in project days and receive advice on their GCSE and future career options.

Charlotte is a first year physics student at Nottingham University who volunteers as a Kusuma Sutton Scholar ambassador, serving as a positive role model to young people interested in Science:

*“This year I have been an ambassador working with the scholars. I have very much enjoyed being a part of these events and seeing the students getting really involved and excited by Science. They get an interesting taste of Science subjects whilst developing their problem solving skills and working in a team. Working with the students has also allowed me to personally develop my communication skills by adapting to different age groups and activities. It is great to help the students develop their interest in Science and share my experience of studying physics at university.”*

## INDIA

### Teaching Interactive Science

Mr Satish Yadav is a Science teacher at the Government Inter College, Tadiyawan in Hardoi. Mr Yadav has 24 years teaching experience and always felt that students were disinterested in studying Science. After participating in training and receiving support from Kusuma he changed the way he delivered his Science lessons. He began explaining concepts through demonstrations, practical experiments and making models from local resources to explain Science theories.

Mr Yadav has used plastic bottles to explain the working principle of a syphon and in order to explain the concept of air pressure he developed a working model of a helicopter. As students showed more interest, he began encouraging them to develop and build their own Science models. His prime focus is now to make all of his teaching activity-oriented and engaging for all students.

*“Since attending the Kusuma training I now love teaching Science and working with students using models. It really helps them understand the theory and its application in real life. It also makes the classroom more fun, interesting and interactive.”*

2. <http://www.sciencemuseum.org.uk>

3. <http://tinyurl.com/ljf99xc7>