

Online resources guide

From the Teacher training and development to inspire STEM education event

The Global Challenge

A joint guide by the Royal Society and the British Council, based upon contributions to an Education World Forum fringe event, 2015

A representative from each of the seven participating organisations outlined how teacher training and development initiatives can help increase STEM participation among students. Audience members also shared their own experiences and ideas. Combined, this highlighted a number of practical initiatives for inspirational science and maths teaching. Many of the programmes mentioned have accompanying online resources, and these are presented here.

This document is intended as an accompaniment to the event write up itself, and provides a summary of the various international programmes that were discussed. It is intended that these resources can then be shared internationally and used to inspire initiatives leading to increased STEM participation globally.

The Royal Society's *Vision for science and mathematics education* report can be found here royalsociety.org/education/policy/vision

Attracting inspirational STEM teachers Teacher Professional Development Initiatives

La main à la pâte Fondation, France

- La main à la pâte has one national centre and nine regional 'houses for science', specialising in STEM continuing professional development (CPD) for teachers in inquiry based science education www.fondation-lamap.org/node/17992 and www.maisons-pour-la-science.org
- La main à la pâte work internationally through their 'fondation la map', supported by the French Academie des Sciences. The foundation provides a large number of online teacher CPD resources in several different languages www.fondation-lamap.org/international-resources
- The 'fondation la map' also holds a number of international conferences and CPD events for teachers www.fondation-lamap.org/en/node/9559

National STEM Centre, UK

- The UK's National STEM centre supports science and maths teachers through subject specific CPD, from primary level through to further education www.nationalstemcentre.org.uk
- The National STEM Centre has a free and extensive online e-library of resources www.nationalstemcentre.org.uk/elibrary

Freudenthal Institute and other Dutch Programmes, Netherlands

- The Freudenthal Institute at the University of Utrecht provides its own teacher professional development programmes. There are also some online training resources (currently in development) www.uu.nl/en/research/freudenthal-institute/studying/training

- The Netherlands have regional STEM centres based at universities that specialise in subject specific CPD, these are often in collaboration with industry. The Freudenthal institute runs one of these at the University of Utrecht called U-Talent
www.uu.nl/en/research/freudenthal-institute/studying/secondary-school/u-talent
- The Netherlands Institute for Curriculum Development (SLO) has an international programme that runs a variety of curriculum projects worldwide
international.slo.nl

National Centre for Excellence in the Teaching of Mathematics, UK

- The NCETM 'Maths Hub' model is a network of teachers training teachers.
www.mathshubs.org.uk
- NCETM also has a large amount of online teacher training resources for mathematics
www.ncetm.org.uk/resources
- NCETM, along with the Department for Education (UK government), are running a Shanghai teachers exchange programme. Maths is taught in UK primary schools by Shanghai teachers
www.mathshubs.org.uk/news/video-snapshot-of-the-shanghai-teacher-exchange-in-one-primary-school
- NCETM works with the Core Maths Support Programme and the Further Maths Support Programme to provide training for teachers and encourage students to take maths post-16.
www.ncetm.org.uk/resources/45410 and
www.furthermaths.org.uk

British Council

- The British Council's Connecting Classrooms is a school partnership scheme between international and UK classrooms, to share best practise and jointly attend professional development courses
schoolsonline.britishcouncil.org/programmes-and-funding/linking-programmes-worldwide/connecting-classrooms and schoolsonline.britishcouncil.org/professional-development
- The British Council Thailand programme trains UK graduates to teach in Thailand and develops resources to teach science in a Thai context
www.britishcouncil.org/study-work-create/opportunity/work-volunteer/thailand-english-teaching-programme

Association of Science Education

- The ASE runs 'teachmeets', this brings together local teachers to share successful and innovative teaching ideas
www.ase.org.uk/news/teachmeets

Practical science

Bringing research skills to the classroom

British Council

- Unbox21 is an initiative that uses computer games to support learning), supported by the Newton Fund
unbox21.org/course

Institute of Physics Development Programme, Africa

- The Physics for Development programme provides a simple kit which can be used to teach complex physics concepts. Some examples of this are discussed here
www.iop.org/about/international/development/education/tanzania/page_65045.html
- There is also a video on YouTube describing the IoP Physics for Development work in Tanzania
www.youtube.com/watch?v=VclRglZcCLQ

Others

- The Langton Star Centre described a scheme for allowing school children to be research scientists in the classroom, for example, by collaborating on a CERN project
www.thelangtonstarcentre.org/#about and cernatschool.web.cern.ch
- The University College London (UCL) 'Think Universe' primary school initiative aims to inspire primary age students (10/11 years) in science and maths
www.ucl.ac.uk/think-universe
- Scientix is an EU funded community for science education in Europe, it provides online teaching resources and support
www.scientix.eu

Diversity and role models

promoting STEM participation and encouraging more ethnic minorities and girls into science

British Council

- British Council Fame Labs is an international competition to find, train and inspire new leaders in science communication in 32 countries, partners include NASA and CERN
www.britishcouncil.org/study-work-create/opportunity/funding-creativity/famelab-science-competition
- British Council are a partner organisation of the EU Make Science Real in Schools (MARCH) scheme. This aims to promote awareness among young people about the relevance of science to careers and everyday life
sciencemarch.eu/index.php/en

Association for Science Education

- The ASE ASPIRES project integrates information about science careers into teaching, so that young people see where science skills can take them
www.ase.org.uk/resources/stem-careers

Others

- The Dublin Academy, Ireland, mentioned both their Festival of Curiosity and Young Scientist and Technology exhibition www.btyoungscientist.ie both aimed at inspiring young people to pursue science. Targeting individual students at both primary and secondary level
festivalofcuriosity.ie
- The STAR schools scheme in South Africa targets bright pupils from disadvantaged areas. They also offer careers advice and guidance to students through industry links
www.starschoolshigh.co.za
- Royal Society and British Library videos to promote ethnic diversity in science
www.bl.uk/voices-of-science and
royalsociety.org/policy/projects/leading-way-diversity/inspiring-scientists
- EU funded Scientix project, 'It's a girl thing!' to encourage girls to pursue science
www.scientix.eu/web/guest/science-girl-thing