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 Utrech 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.

national.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.
- 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](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

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](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](www.btyoungscientist.ie) both aimed at
  inspiring young people to pursue science. Targeting
  individual students at both primary and secondary level
  [festivalofcuriosity.ie](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](www.starschoolshigh.co.za)
- Royal Society and British Library videos to promote
  ethnic diversity in science
  [www.bl.uk/voices-of-science](www.bl.uk/voices-of-science) and
  [royalsociety.org/policy/projects/leading-way-diversity/
  inspiring-scientists](royalsociety.org/policy/projects/leading-way-diversity/
  inspiring-scientists)
- EU funded Scientix project, ‘It’s a girl thing!’ to encourage
  girls to pursue science