

Vision

for science, computing
and mathematics
education

Progress update 2018

For further information

The Royal Society
6 – 9 Carlton House Terrace
London SW1Y 5AG

T +44 20 7451 2500

E education@royalsociety.org

W royalsociety.org

The Royal Society

The Royal Society is a self-governing Fellowship of many of the world's most distinguished scientists drawn from all areas of science, engineering, and medicine. The Society's fundamental purpose, reflected in its founding Charters of the 1660s, is to recognise, promote, and support excellence in science and to encourage the development and use of science for the benefit of humanity.

The Society's strategic priorities are:

- Promoting science and its benefits
- Recognising excellence in science
- Supporting outstanding science
- Providing scientific advice for policy
- Fostering international and global cooperation
- Education and public engagement



Founded in 1660, the Royal Society is the independent scientific academy of the UK, dedicated to promoting excellence in science.

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THE
ROYAL
SOCIETY

“If we are to truly benefit from the development of new technology, we must act quickly to make sure our education system and curriculum is ready.”

Rt Hon Robert Halfon MP.

To equip people to work in an advanced economy, the Royal Society’s ambition for science, computing and mathematics education is to enable people to make informed choices, and become empowered to shape scientific and technological developments.

We set out proposals for achieving this ambition in the *Vision for science and mathematics education* report in 2014. This aimed to raise the general level of mathematical and scientific knowledge, increase the population’s confidence in science and provide the skills employers need. This 2018 update highlights key activities since the publication of *Vision*.

For more information, visit royalsociety.org/education

OUR VISION	All young people study a broad and balanced curriculum, including maths and science.	Curricula and assessment are stabilised and support excellent teaching and learning.	Teachers have high professional status and there is a strong supply of science and mathematics specialists.	Students understand the significance of science, technology, engineering and mathematics (STEM) through better careers awareness and guidance.	The success of students, teachers and education systems is judged through broadly based assessment and accountability measures.	Education policy and practice are better informed by evidence.
The Society’s work	<p>The Royal Society Advisory Committee on Mathematics Education (ACME) provides phase-specific advice on maths education.</p> <p>Commissioned research looking at curriculum breadth in UK post-16 education.</p> <p>Commissioned research to establish whether and how universities signal the importance of having quantitative skills.</p> <p>Reviewed the extent to which data science skills are nurtured across England’s National Curriculum.</p>	<p>Royal Society Schools Network for science, maths and computing teachers to exchange teaching concepts and share ideas.</p> <p>Continual Professional Development for Royal Society Schools Network teachers.</p>	<p>Published our comprehensive review of teachers’ confidence in delivering the new computing curriculum.</p> <p>The Royal Society ACME produced a snapshot on key issues in maths teacher supply.</p> <p>Braided Careers case studies have highlighted four ways of encouraging flexibility within the teaching profession.</p> <p>Commissioned a set of twelve case studies looking at national teacher training systems for science teachers.</p>	<p>Our Brian Cox School Experiments resources feature videos highlighting STEM careers.</p> <p>Our Royal Society Schools Network improves schools’ access to scientists from industry and academia.</p> <p>Over 100 schools a year visit the Summer Science Exhibition and meet scientists from across the UK.</p> <p>Our Partnership Grants partner schools with scientists so pupils can see what a career in science really involves.</p>	<p>Gathering evidence on the impact of experimental science on pupils’ outcomes. Supporting Ofqual and awarding bodies to monitor reforms of qualifications.</p> <p>The Wellcome Trust, the Gatsby Charitable Foundation and the Royal Society have funded two projects to explore how best to assess students’ experimental science skills.</p>	<p>The Royal Society and the British Academy published the report of their investigation into how education policy and practice can be better informed by educational research</p> <p>The Royal Society and the Education Endowment Foundation published a review of the attainment gap in science, showing that this exists pre-school, increases throughout primary and secondary education, and is strongly linked to poor English literacy.</p>
Key developments	<p>A Core Maths qualification at level 3 for those not studying AS or A-level Maths.</p> <p>Following the Sainsbury review, new technical pathways, T-levels, are being introduced.</p> <p>Following the Sir Adrian Smith’s report the Government is investing in post-16 mathematics education.</p> <p>Qualification reforms and funding changes have reduced the number and narrowed the breadth of A-levels typically taken.</p>	<p>Major curriculum reform in Wales, including a Digital Competence Framework and a new STEM curriculum plan for schools.</p> <p>Reformed GCSE and A-level qualifications for maths and science have been introduced in England. The Government is committed to make no further changes in the medium term.</p>	<p>The Government committed to creating a teacher recruitment and retention strategy.</p> <p>£100 million to upskill computing teachers and create a National Centre for Computing.</p> <p>£42 million for a Teacher Development Premium pilot.</p> <p>£27 million for improving the teaching of maths through the Teaching for Mastery programme.</p> <p>The Government consulted on changes to Qualified Teacher Status and strengthening career progression for teachers.</p>	<p>The Wellcome Trust’s 2016 Science Education Tracker found 43% of young people are interested in a science-related career.</p> <p>The Government published statutory guidance for governing bodies, school leaders and school staff in 2017 to assist schools and colleges in meeting the Gatsby Benchmarks on career guidance and provision.</p> <p>A new Careers and Enterprise Company was set up in 2014 to support collaboration between schools, colleges and employers on careers guidance.</p>	<p>GCSE and A-level students are required to undertake a minimum number of practicals as part of their course. A-level science pupils are awarded a practical endorsement alongside their grade.</p> <p>Local Authorities are developing school-led improvement systems for collaboration and shared accountability.</p> <p>Regional schools commissioners intervene in underperforming schools.</p>	<p>The National Foundation for Education Research and the Education Endowment Foundation continue to lead on the use of research and evidence by teachers.</p> <p>The number of Research Schools expands to 23, aimed at increasing the use of evidence in teaching.</p> <p>The Chartered College of Teaching signs an evidence Magna Carta with other professions in support of evidence-led teaching. Its new Chartered Teacher programme includes a research component.</p>