National STEM Learning Network

Working to achieve a world-leading STEM education for all young people across the UK

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We will have achieved our vision when:

• all young people are **enthused** about STEM from an early stage - an engagement which is built on and developed throughout their education

• there are more pupils from **all backgrounds** opting to study more STEM subjects, for longer, through **vocational** and/or academic routes

• there are greater numbers progressing to study STEM at HE, and entering the workforce
Young people were asked what had encouraged them to learn science and what had discouraged them:

**Teaching quality** was the most common answer to both questions

Encouragement – having a **good** teacher (58%)
Discouragement – having a **bad** teacher (43%)

*Ref* Wellcome Trust Monitor 2013
Who works with us?

Working in partnership across STEM education
STEM Learning

STEM Learning is an initiative of the White Rose University Consortium (comprising the Universities of Leeds, Sheffield and York) and Sheffield Hallam University.

Our work is made possible by the generous support of the Wellcome Trust, Gatsby Charitable Foundation, the Government, our partners in Project ENTHUSE and other funders of related STEM projects.
The National STEM Learning Network

- Professional development nationwide
- 30,000 STEM Ambassadors from more than 2,500 employers
Supporters

wellcome trust

Department for Business, Energy & Industrial Strategy

Gatsby

bp

Rolls-Royce

Department for Education

Royal Commission Exhibition of 1851

The University of Sheffield

MEI Innovators in Mathematics Education

BAE SYSTEMS

University of Leeds

BIOCHEMICAL SOCIETY

Royal Society of Chemistry

IBM

IET The Institution of Engineering and Technology

The University of York

The Institution of Structural Engineers

STEM LEARNING
Who we work with

School, college and university staff
Young people
Informal educators and leaders of community and voluntary groups
STEM Ambassadors

Employers, government and charities

What we facilitate

STEM inspiration activities and CPD for staff
- face-to-face and online CPD
- study visits and placements with R&D institutions, employers and academia

Resource engagement
- physical and online curated resources focussed on STEM subjects
- cutting-edge research collections
- STEM careers Information and curriculum guidance

Vision
To achieve a world-leading STEM education for all young people across the UK

Outcomes

Improvements for teachers, support staff and informal educators in their:
- STEM subject and pedagogical understanding
- confidence, motivation and enthusiasm for STEM subjects
- competence and quality of leading, teaching or supporting STEM subjects
- understanding how to contextualise the curriculum with cutting-edge STEM knowledge, employability skills and STEM-related careers information
- retention and career progression

Increasing STEM Ambassadors:
- professionalism, communication, team working, organisational, mentoring, leadership, delegating and relationship management skills
- understanding of education and how to inspire young people in STEM
- retention in a STEM-based career

Helping employers to:
- develop an enthusiastic, motivated and skilled STEM-based workforce
- access an increasingly competent pool of young people with employability and STEM skills with the potential to become future employees
- better inform young people and parents about STEM career pathways and the employment opportunities available with STEM employers

Increasing young people’s:
- engagement, interest, enjoyment and achievement in STEM subjects
- development of employability and practical skills
- post-16 pursuit of STEM subjects and progression into STEM-related study and careers

Network of STEM experts: STEM Ambassador Hubs, Science Learning Partnerships, partners in SWANI, employers and supporters
Achievements…

• the Network has positively impacted over 4,000,000 pupils
• around 27,000 days worth of CPD are delivered yearly throughout the Network
• the National STEM Learning Centre alone has engaged over 80% of all secondary schools and 11% of primary in CPD, conferences and events (the Network even more)
• over 3,000 educators benefit from residential CPD at York each year, with another 20,000 receiving high quality STEM-specific CPD locally
• 30,000 STEM Ambassador volunteers representing around 2,500 employers take part in over 50,000 activities with schools, colleges and other young people’s groups annually
Project ENTHUSE 2016-17

- bursary funded, face-to-face CPD for 2,887 teachers and technicians
- 9,250 UK teachers engaging in online CPD
- 80 teachers/lecturers undertaking STEM Insights placements with employers & Universities
- 42 ENTHUSE Partnerships; 248 schools and colleges (201 primary / 47 secondary) focusing on under-represented groups
- **engaging up to 1.1 million young people** with STEM through their teachers and school leaders
Planning for impact - school level

1. Strategic planning of the CPD
2. Sharing and embedding what is learned
3. Evaluating impact in the classroom
4. Refining and sustaining the approach

Impact on staff, pupils, the school itself and other schools
Impact process - participant level

NSLN PROFESSIONAL DEVELOPMENT

BEFORE CPD

B1 Learning Objectives

DURING CPD

D1 Action Plan

D2 Learning & Evaluation Tool

D3 Participant Evaluation

Post-CPD

P1 8 weeks after the end of CPD

P2 6-9 months after the end of CPD

P3 Annual Departmental or Primary School Impact Assessment

SCHOOL Performance management and Teacher standards

School Development Plan

Ofsted Criteria

Annual Departmental or Primary School Impact Assessment

LINKS to SCHOOL
Impact on pupils from teachers attending intensive CPD

- Greater motivation and engagement in lessons: 83%
- Improved progress in STEM subject(s): 51%

Impact from teachers attending intensive CPD on wider school or college

- Improved quality of subject teaching: 70%
- Raised profile/priority of STEM subjects: 49%
- Increased capacity and capability for STEM teaching: 43%

Intensive CPD at the National STEM Learning Centre
Science Learning Partnerships in England, and partners in Scotland, Wales and Northern Ireland

Local, high impact, quality assured subject-specific professional development

Impact from teachers attending local CPD

Self: 99%

Pupils: 96%

Wider school or college: 95%
Independent evidence and research shows that our CPD improves teaching; leading to better outcomes for young people.

Participate in CPD

Improved outcomes for teachers, technicians, and support staff

- subject & pedagogical knowledge and awareness of STEM careers
- confidence, motivation and competence
- leadership within STEM
- quality of teaching
- retention and career progression

Improved outcomes for young people in STEM

- increased engagement and achievement in STEM subjects, and higher levels of STEM literacy
- increased progression to STEM studies and STEM-related careers post-16
Primary schools that engage with Network support improve more rapidly and show higher value added than other schools

Improvement in percentage achieving L4+ at KS2 science, 2012-2014

- Users (4+ courses with reasonable spread over 2 years): 5.94
- Users (4+ courses attended): 2.12
- Users (1+ courses attended): 1.87
- No courses attended: 1.65

Impact of National STEM Learning Network CPD on schools, Isos Partnership 2015
Network of Science Learning Partnerships

What the network has delivered

- 20,406 CPD units delivered (over 102,000 CPD hours)
- To 14,547 teachers and technicians
- In 6,721 schools and colleges
- Potentially reaching up to 4 million pupils and students
STEM Insight
lifting the lid on STEM careers for teachers

Insight | into industry
During a placement, develop your knowledge of STEM careers and routes for your students to progress into STEM-related employment. Work with world-leading employers across a range of STEM industries such as manufacturing, engineering, medical, computing and many others.

Insight | into university
Spend time in a leading UK university and learn about the latest cutting edge research in your field. Support your students as they make the transition to university.
Impact of STEM Insight on participants

- more confident in talking to students about careers in science and engineering
- more able to use appropriate practical examples in lessons
- improved understanding of breadth and depth of STEM careers
- more confident in discussing apprenticeships and vocational routes with young people, colleagues and parents
Resources

Thousands of curriculum-linked, quality-assured STEM teaching resources
We house the UK’s largest collection of physical and online resources to support the teaching of STEM subjects.
Resource centre

- at the heart of the National STEM Learning Centre
- thousands of physical resources, including books, reports, gadgets, DVDs
- extensive archive collection – the best of the past 100 years
- digitised versions available via the online collection
Online resource collection

- more than 10,000 resources
- free to download
- classroom activities, guidance, policy, research
- print, multimedia, interactive and practical
- curated collections linked to subject, curriculum and careers
- quality assured
- tried and tested
Examples of STEM Ambassador activity

- Classroom
- STEM Club activities
- Careers talks
- Speed networking
- Online mentoring
- Site visits and hosting work experience
- Large science festivals and fairs
- Non-school group
Keep in touch

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