



Making a difference
to professional practice

The National STEM Centre

Making a difference to professional practice

The National STEM Centre supports the teaching and learning of science, design and technology, computing, engineering and mathematics (STEM) education in schools and colleges throughout the United Kingdom, from primary level to post-16. We enable educators and partner organisations to share successful practice and support them through our National STEM Centre in York or via our website: www.nationalstemcentre.org.uk

Read on to find out more about our:

- vast range of free resources in the National STEM Centre eLibrary
- online community groups
- planning tools and case studies
- impressive collection of resources, gadgets and material held at the National STEM Centre in York
- wide variety of events, conferences and CPD opportunities
- support for educators and partner organisations

Our team

Experienced teachers work at the National STEM Centre. They draw on their subject and phase expertise to create resource packages for different subjects, topics and age ranges. These are linked to the National Curriculum so can provide good starting points and save time that users might otherwise have spent searching for resources and ideas.



*"The collection *Improving Learning in Mathematics* contains a wealth of resources useful both in the classroom and in department meetings when discussing pedagogy. A good place to start is the booklet *Challenges and Strategies* which explains the underlying principles behind the development of the Active Learning approaches in the materials."*

Post by Steve Lyon (Mathematics Specialist, National STEM Centre) on the secondary mathematics resource group.

*"I used this resource last week with my year 9's and it was excellent. Brilliant resource, uncovered misconceptions, and the *Guess the Number* game that is suggested at the end for extending and reviewing was a great hit! Overall, great resource."*

Response by a secondary mathematics resource group user

Online

National STEM Centre eLibrary

The **eLibrary** hosts thousands of resources to support teaching and learning of STEM subjects, and is totally free to use. There are contemporary publications, videos, Teachers TV programmes, multi-media resources and research publications. Teachers, technicians and National STEM Centre partners rate resources and feedback on how they can be used.

Already finding the eLibrary useful. One of our student teachers wanted to demo neutralisation with indigestion tablets the other day. After a test run with Universal Indicator failed I found this, and we used a simpler version. Methyl Orange is the answer!

Emily (secondary science teacher) – about Royal Society of Chemistry practical activity sheet 'Neutralisation of indigestion tablets'
www.stem.org.uk/rxbgd

Good resource to get pupils to recall the theory and put it into practice in a work based scenario. I feel it would open up more pupils' minds into pursuing one of these careers, especially if they find that they are good at it!

Rochelle (secondary science teacher) – about 'Heart surgery and dissection' video
www.stem.org.uk/rx8s3



Resources

26,523

resources available in the Library



12,830 science



3,424 technology



7,628 mathematics

9,132

resources available in the eLibrary



6,160 science



1,306 technology



2,591 mathematics

Research on the eLibrary

The eLibrary offers access to educational research about different aspects of STEM education. Users can search the extensive research documents available to develop their practice and ideas.

I am a B Ed student in my second year of training. The article Understanding misconceptions, teacher guidance has given me some fantastic supporting points for an assignment that I have been struggling with. So many thanks.

Samantha (trainee teacher) on 'Understanding misconceptions'
www.stem.org.uk/rx99

Careers

Teachers might also draw on the resources and guidance about STEM careers to help to enrich pupils' learning so that they begin to understand the pathways and opportunities that they can pursue in STEM subjects and careers.

www.nationalstemcentre.org.uk/elibrary/careers

Community groups

The National STEM Centre helps teachers and technicians to share ideas, successful practice and to access specialist expertise. This supports professional learning leading to new classroom approaches. Teachers and technicians can share what works in their classroom, discover new approaches to teaching particular topics and keep abreast of curriculum developments.

The National STEM Centre site hosts a variety of online communities and discussion groups of interest to educators. Members can share information and advice, and exchange ideas about current developments, challenges or opportunities. There are groups for educators with similar roles, phases or interests; for particular geographical areas; for members of schools or groups of schools; or across schools and colleges.

Resource community groups

The resource community groups provide a space where those working within education share good practice, recommend resources, and further their own knowledge through shared discussion and advice. Teachers are becoming more active in sharing their own resources and posting useful links.

I also receive regular bulletins from the community – people are generous in sharing their work. It has helped me to keep up to date with current issues, being the only science teacher in a school is quite isolating, and there are few opportunities for special school subject specialists to feel part of a group.

Helen (special school teacher)

Sharing practice

Regular updates from community groups and the monthly National STEM Centre eNewsletter keep users up to date about news, opportunities and current debates in education.

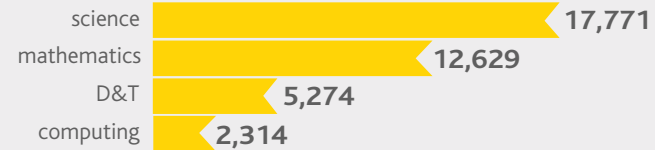
National STEM Centre registrations



63,024

work in UK schools and colleges

UK Secondary STEM teachers

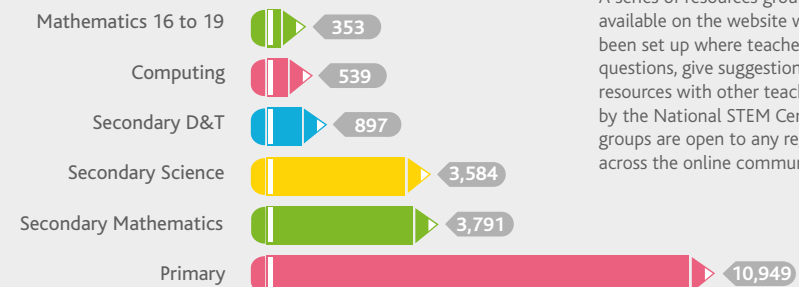


UK Primary STEM teachers



Resources groups

Number of group members



A series of resources groups are available on the website which have been set up where teachers can ask questions, give suggestions and share resources with other teachers. Managed by the National STEM Centre, these groups are open to any registered users across the online community.

Planning tools

Our online STEM planning tools, such as the STEM Planner and the STEM Manager, help senior leaders and subject leaders to develop STEM provision in their school – including improving the physical environment and enrichment and enhancement approaches.

www.nationalstemcentre.org.uk/stem-in-context/stem-planning-tools

Self-Evaluation Tool

The Self-Evaluation Tool, based on the four point Ofsted grading scale, has been designed to support secondary science departments by identifying strengths and areas for development as part of their self-evaluation process, providing them with useful courses and resources.

www.nationalstemcentre.org.uk/stem-in-context/support-for-science-self-evaluation

Case studies

Case studies of successful practice in other schools, available in the eLibrary, can be helpful to senior leaders and subject leaders, providing starting points for reflecting on current practice in their own school and ideas for tried and tested approaches.

stem.org.uk/cx3xw



Support for subject leaders

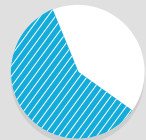
The National STEM Centre has helped me in my role as science Key Stage 2 lead through forums and resources.

Member of primary resources group www.nationalstemcentre.org.uk/community/groups/112/resources-primary

The National STEM Centre has a range of support available for subject leaders, including:

- the eLibrary to keep up to date with emerging leadership approaches and curriculum developments
- networking, through the online community, with other subject leaders
- continuing professional development (CPD) and resource collections can help facilitate high quality curriculum development

UK Schools with one or more teacher registered



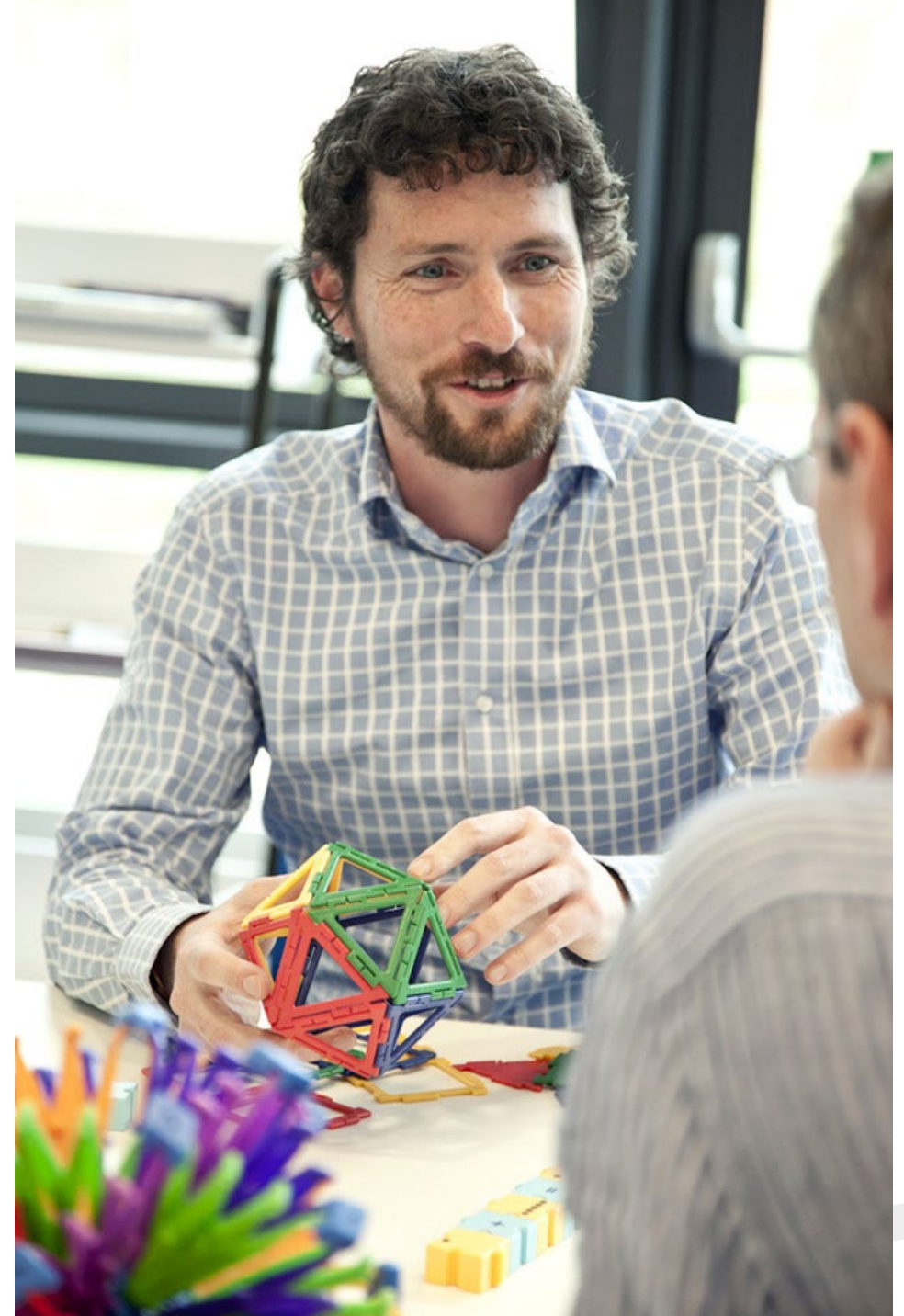
59%
Primary



100%
Secondary



96%
Colleges



Support for technicians

High quality technical support is essential to good quality practical work in science, technology, computing and engineering. The National STEM Centre can help technicians to keep up-to-date with and respond to changes to the curriculum, new assessment requirements particularly of practical skills, new teaching and learning approaches and cutting edge developments in STEM subjects.

Through the National STEM Centre, technicians can establish links with technicians in other schools and learn about what works elsewhere. They can share ideas, best practice and explore ways of overcoming problems.



The practical pages of the eLibrary have been really useful – so good to have all the information collected together in one place rather than having to use multiple websites. We are a relatively new school (7 years) so do not have the collections of textbooks/older resources that older schools have – the eLibrary gives me access to lots of these. As a very experienced technician working with a largely very young, inexperienced group of teachers and technicians I am frequently asked for ideas for practical work or resources to enhance their teaching and the practical pages of the eLibrary is one of the first places I look – the lists are particularly helpful. The only problem is that I get distracted by good ideas I see not related to what I'm supposed to be finding!

Similarly when I have visited the National STEM Centre, it has been good to be able to look at a range of books – I was responsible for all ordering as the school developed and used visits to the centre to research available books both for use in the department and as suggestions to our librarian for the science section of the library.

Philippa (secondary school senior science technician)

Online community and curriculum resource groups can help technicians to keep up-to-date and share ideas. These might be regional, for example the Brighton and Hove technicians group and the HEaTED London group, or national for example the science technicians group or the secondary science resource group. Some groups are set up specifically for participants on CPD courses.

National STEM Centre website usage



2.4 million

unique visitors since site launch

per month

Average

89,198

visitors per month
in 2015

per month

Average

117,450

visits per month
in 2015

I have always used the community groups that have been set up for courses; they are very helpful and help me to keep in touch with other technicians that I have met on the courses. I always visit the STEM Centre when I am there as I normally pick up free leaflets or booklets for ideas that help me in the clubs I run.

Angie (secondary school chief science technician)



The National STEM Centre in York

The National STEM Centre is an inspiring learning environment, which includes a physical resource centre, accommodation and on-site restaurant.

The National STEM Centre is an ideal venue for:

- departmental away days
- cross-curricular planning events
- whole-school STEM training

Many other organisations also use also use the Centre to host meetings and training sessions.



Sarah, the science coordinator at Clifton with Rawcliffe Primary School, has organised science focused meetings at the National STEM Centre for: Foundation; Key Stage 1; and Key Stage 2 staff.

Her colleagues appreciated the opportunity to explore the eLibrary, to look at physical resources and to focus on curriculum planning supported by National STEM Centre staff, who provided advice about ways of finding suitable resources and embedding them in schemes of work. An online community enables teachers at the school to share planning and resource ideas.

Since the original meeting, they have returned to the National STEM Centre in small groups to plan together and use the resources.



The physical resource collection

The National STEM Centre physical resource collection is open to visitors all year round. The online library catalogue and National STEM Centre staff can support visitors to make best use of the collection.

I teach in London. But it's worth the journey!
Fahmina (secondary school science teacher)

Professional learning

It was lovely to have time to explore the eLibrary and create lists (of resources) for upcoming topics and a whole staff science day... I plan to introduce all staff to the website and range of resources... will also let maths and DT subject coordinators know.

Participant on 'Resourcing the primary science curriculum' workshop www.slcs.ac.uk/NY038

The National STEM Centre also runs subject-specific conferences, events and courses through the year. Our subject specialists stay on top of the latest changes in practice, research and the curriculum to provide quality training and practical information.

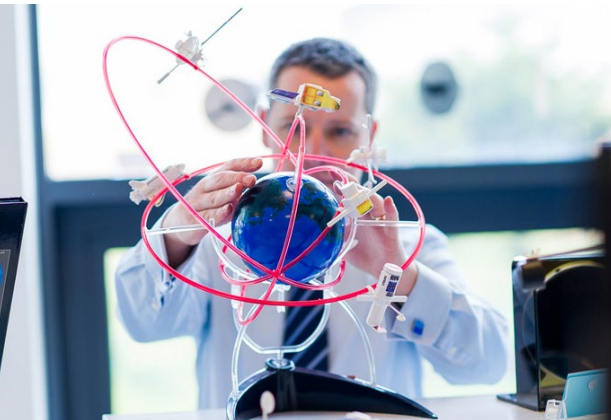
Our courses also provide advice about making the best use of resources in the eLibrary and physical resource collection to support the planning and resourcing of high quality lessons.

Today has been really useful. We are leading an INSET in November and now feel better equipped to lead the staff and offer them support.

Participant on Resourcing the primary science curriculum www.slcs.org.uk/NV038

Incredible...it is really fascinating how we as teachers can develop connections with all the three sciences together.

Comment by Photon on a case study that describes how the year 8 science curriculum is based around space.



Support for space education

ESERO-UK

Also known as the UK Space Education Office, ESERO-UK promotes the use of space to enhance and support the teaching and learning of STEM in schools and colleges throughout the United Kingdom. ESERO's programmes enable educators and partner organisations to share successful space-related teaching and learning approaches and resources.

www.esero.org.uk

The National STEM Centre web site hosts ESERO resources, case studies and information about CPD to develop the use of space as a context for teaching and learning in STEM subjects.

www.stem.org.uk/cx5k



Prospect Vale Primary School participated during 2013-14 school year in the ESERO primary science project. Staff were provided with expert support, advice and practical assistance – including CPD, in-class support, assistance in setting up activities for pupils led by scientists and engineers working in the space industry and help in setting up visits for pupils to space related locations such as the Daresbury Laboratory. As a result of the project, pupils reported that they enjoyed space related learning, teachers gained new knowledge and confidence and space is now embedded in the curriculum.

On completion of the project, 81% pupils said that they would like to use science in their jobs, and 92% were able to name jobs which include science.

To find out more:
www.nationalstemcentre.org.uk