



THE STEM AMBASSADOR PROGRAMME

A GUIDE TO WORKING WITH STEM AMBASSADORS
FOR PRIMARY AND SECONDARY SCHOOL TEACHERS
AND FE COLLEGES





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STEM LEARNING AND THE STEM AMBASSADOR PROGRAMME

STEM Learning is the largest provider of education and careers support in science, technology, engineering and mathematics (STEM).



We offer

support and guidance to enhance the teaching and learning of STEM subjects:

- high-impact **CPD courses** for educators
- quality-assured **learning resources**
- **the STEM Ambassador programme – 30,000+ volunteers from around 7,000 employers sharing knowledge and experiences free of charge to help young people of all ages achieve more and progress further in STEM**
- professional awards and recognition schemes designed to celebrate excellent practice

Look out for the black or white bold hyperlinks in this handbook



Our vision:

A world-leading STEM education for all young people across the UK



Supported by:

A unique partnership of Government, charitable trusts and employers



Working with:

Schools, colleges and youth and community groups



The impact [of the STEM Ambassador programme] is widening horizons and raising awareness and raising aspirations because some of the children don't think they have the skills and abilities to be successful in a field. But, when they meet someone who tells their story about what they did, and how they got there, it can really help them have that confidence to progress."

Science Teacher, Cumbria

The STEM Ambassador programme is completely free of charge

MEET THE STEM AMBASSADORS

STEM Ambassadors are positive role models who give their time and enthusiasm for free to bring STEM subjects to life and demonstrate their value.



STEM Ambassadors who can talk about their everyday life once they've left school, or are further on in their developed careers, can really focus students. They're effectively an interface between the student and the opportunities which are out there."

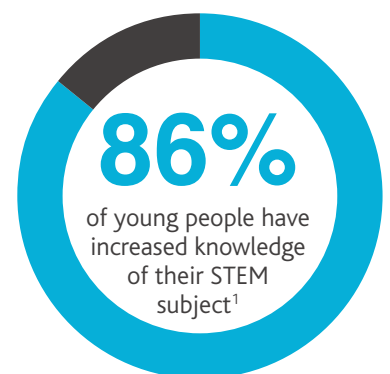
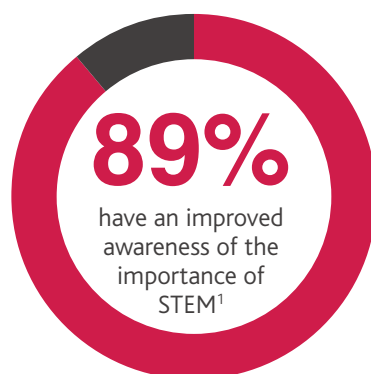
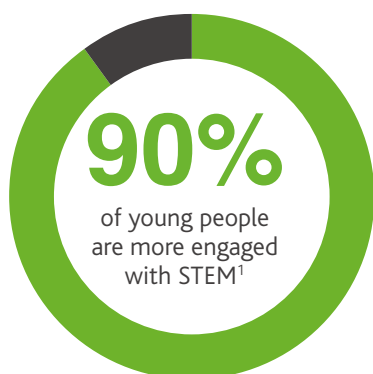
Russell Davies, Head of Design and Technology



STEM AMBASSADORS BRING MANY BENEFITS

Engaging young people of all ages

After working with STEM Ambassadors:



Helping young people to see a future for themselves in STEM

Research shows that inspiring STEM role models can boost students' Science Capital² and help them see a future for themselves in STEM.



The STEM Ambassadors inspired the girls in under-represented STEM subjects, such as physics, by showing them how they connect with issues girls care about and their gateway to interesting careers."

Teaching and Learning Coach, Harwich and Essex

¹STEM Ambassador Impact Report, 2016

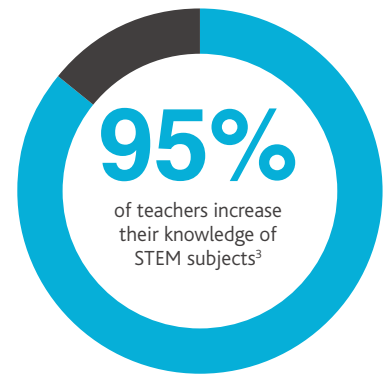
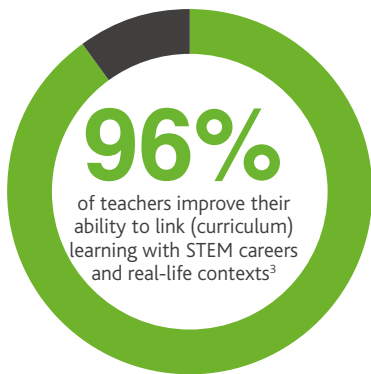
²Science Capital is based around theories of social capital. The more of it you have, the more likely you are to believe that 'science is for me', which can lead to engaging better as well as taking science education further.

stem.org.uk/sites/default/files/pages/downloads/Science-Capital-Made-Clear.pdf



Enhancing the quality of teaching

By bringing learning from business and industry into the classroom, STEM Ambassadors enrich teaching and learning with current and cutting-edge STEM contexts. Through working with STEM Ambassadors:



Before the programme I didn't feel I had sufficient knowledge of STEM careers to talk with confidence. Now I am equipped with up-to-date knowledge, real examples and experiences, as well as strong industry links that I can use to benefit the whole school."

Alice Kupara, Thomas Deacon Academy

Supporting teacher retention

After working with STEM Ambassadors, teachers are more likely to stay in teaching and progress in their career.



This session really reignited the staff's enthusiasm for our subject: it would be great CPD for all teachers!"

Head of Science, South Tyneside

³This data comes from analysis of data on the STEM Ambassador website that is reported by the teachers themselves

Supporting participating secondary schools and colleges across the UK to deliver these Gatsby Careers Benchmarks⁴ (and the equivalent benchmarks in other areas):

- 2 Learn from career and labour market information.
- 3 Address the needs of each student – through challenging stereotypes and seeking to raise the aspirations of students.
- 4 Link curriculum learning to careers – highlighting the relevance of STEM subjects.
- 5 Provide encounters with employers and employees – creating opportunities to learn about work, employment and the skills that are valued in the workplace.
- 6 Facilitate experiences of workplaces – through work visits, work shadowing and/or work experience.

“Pupils now have an improved understanding of the applications of mathematics and its relevance in the real world and in many different careers. They appear more engaged and have a genuine interest in the subject and in continuing this course of study at university.”

Mathematics Teacher, Scotland

Find out more about the impact of the programme **online**.

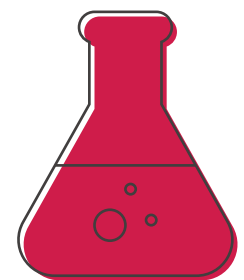
⁴The Gatsby Benchmarks provide a framework for best practice in careers, underpinning the Department for Education guidance to schools on meeting their statutory responsibility for careers guidance. [stem.org.uk/career-benchmarks](https://www.stem.org.uk/career-benchmarks)






STEM AMBASSADORS CAN OFFER SUPPORT IN MANY WAYS

There's no limit to the ways in which STEM Ambassadors can inspire the next generation! They:

- show how STEM subjects apply in the **real world**
- illustrate what a **career** in STEM really looks like and share their own stories
- challenge young people to solve **real-life problems**
- bring **specialist equipment** for young people to experience
- make STEM relatable by bringing **experience of the everyday** into lessons



You can request a STEM Ambassador to deliver a new activity or support an existing one. They visit schools / colleges or host visits at their place of work, and deliver a wide range of activities, completely **free of charge**.

STEM activities	Support with or deliver workshops, enrichment days, exhibitions, STEM fairs or STEM Clubs	Judge school STEM competitions	Bring specialist equipment for young people to experience	Host a school trip
				
Careers support	Give careers talks or help at careers fairs	Host a workplace visit or work experience	Speed networking with pupils, parents and teachers	Help students with mentoring, mock job interviews and CV writing
				
Wider school & college support	Develop and run CPD for educators or talk to a teacher to help with any questions	Provide support and advice for governors, headteachers and senior leaders	Develop curriculum, resources and activities	Develop connections with local businesses
				

The opportunities are endless – thinking outside the box is what really inspires our young people!
If you have an idea, speak to your local Hub.

GET INSPIRED!

We asked some STEM Ambassadors about their favourite volunteering experience

Younger students

"An apprentice day at a local primary talking about **sensory science**."

"The **water supply challenge** in a primary school in Hertfordshire, their participation, enthusiasm and engagement was outstanding."

"My best STEM Ambassador activity I have ever done is **designing and building electric fan boats** with all 180 KS2 pupils at my local school. They were so engaged and excited, and they even got to take their boats home to keep."

"Difficult to choose... anything hands-on is an instant hit with primary school aged children. **Making snot (slime)** with lots of children at our university festival was great fun!"

"Taught reception classes about **electricity**."

"**Extracting DNA** from strawberries. It was messy and engaging."

"Taking live insects and entomology activities."

"Setting up a **paper aeroplane challenge**."



Watch **STEM Ambassadors in action** on the **STEM Learning website**



Older students

"Bitesize 15 to 20 minute **career insight sessions** to year 7 and 8 students including a Q&A for them to work out what my main career and place of work were."

"**Student mentoring, career sessions, CV writing, mock interviews and STEM activities** in general are the most rewarding part of this, especially when I can help those that aren't sure of their aspirations or strategy, and those with SEN needs."

"Helped a school deliver their **Zombie Apocalypse STEM day**, during which STEM classroom activities were used to counteract the Zombies."

"A **talk about my day-to-day design activities**, and how they related to the students' coursework."

"Developing and delivering '**Science in a Box**' to show Yr9 students the breadth of STEM careers in the pharmaceutical industry."

"**Speed networking** with a selection of pupils put into groups to ask questions about my career/profession."



FINDING A STEM AMBASSADOR IS EASY

There are three ways to **find and request a STEM Ambassador**:

1. On the STEM Ambassador website

Register and post your requirements to directly communicate with STEM Ambassadors. The process is quick and easy, but there are some tips for posting your requirements on **page 11–12** and **more information online** if you need it.

Browse through the **offer pages** of local STEM Ambassadors online, and express an interest in any offers that might be a good match to discuss your needs.

2. Via your local STEM Ambassador Hub

Our network of 19 STEM Ambassador Hubs coordinate the volunteering opportunities of over 30,000 STEM Ambassador volunteers across the UK. If you are not sure exactly what you are looking for, contact your Hub for support, opportunities and local expertise. They develop links between groups and individuals working to enhance young people's STEM education.

Find out how to **get in touch with your local Hub and sign up for email updates** online.

3. Through your existing contacts

Promote the STEM Ambassador programme to your parent body via your usual communications. Encourage parents to sign up – and to volunteer at your school or college! Consider connecting with local employers that you know.

If you haven't heard from the STEM Ambassador within two weeks, or enough time to manage your diary, contact your local Hub to let them know

Any queries, please contact your local STEM Ambassador Hub

WRITING A GOOD ACTIVITY LISTING



Once you have registered you will be able to advertise an activity. It's best to put your request in as early as possible for the best chance of support. Follow our top tips to make your activity sound interesting and worthwhile for volunteers.

Interactive Rocks and Fossils lesson in Whitby, Yorkshire

Number of Participants: 30

Age Range: 7-11 years

Ambassadors: 1

Participating Organisations:

Church Lane Primary School

Activity Type:

Hands on practical

Aim:

For pupils to handle some rocks and fossils and learn about rocks and fossils and the local landscape

Description:

We are looking for STEM Ambassadors who can talk to pupils about rock formation, how fossils are developed, and link this to our local area.

The curriculum says that pupils should be taught to: compare and group together different kinds of rocks on the basis of their appearance and simple physical properties; describe in simple terms how fossils are formed when things that have lived are trapped within rock.

Pupils will have gone through the basics of how rocks are formed, but haven't been introduced to fossils, and haven't seen any real examples.

It would be great if a STEM Ambassador was able to bring in examples of rocks and fossils. We would like the session to last around an hour to an hour and a half, and ideally it would take place on Wednesday or Thursday mornings, but that is flexible.

After the session, we would like pupils to be able to describe how a fossil is formed.

This is the first thing STEM Ambassadors will see when they are browsing volunteering opportunities.

Keep the title simple and descriptive. Include your location in the title, so volunteers can see at first glance whether they can get to you.

Can add multiple organisations if applicable.

Include curriculum links if relevant.

It is helpful to include details about what pupils will already know.

Make it clear where you can be flexible.

Employability talk in Peebles, Scotland

Number of Participants: 250

Age Range: 14-16 years

Ambassadors: 2

Participating Organisations:

Hilldale High School

Activity Type:

Employability skills session, e.g. mock interviews / CV writing

Aim:

For students to understand what employers are looking for in interviews

Description:

We are looking for one or more STEM Ambassadors from any area of STEM to come in and talk to students about interview skills. This might involve running through Dos and Don'ts from an employer perspective, and sharing their experience.

We would like the Ambassadors to deliver their talk within the context of an assembly (15-20 minutes) for a group of 250 Year 10 students who will soon be completing work experience. Many of them will be required to undertake an interview as part of this process. Year 10 assemblies take place on Thursdays at 9am. We would like to do this one Thursday in April.

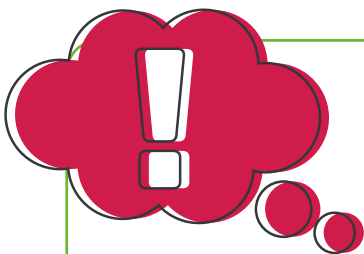
A large screen and a laptop will be available if you wish to use PowerPoint or show films.

After the session, we would like students to feel more confident about interviews, and to be able to list some Dos and Don'ts.

Be as specific as possible about timings etc.

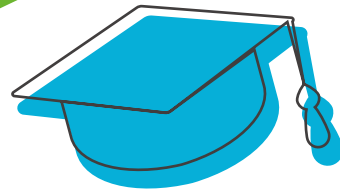
Make it clear what facilities will be available.

Tell us about the impact you would like the activity to have.



Remember! Click **offer position** each time a STEM Ambassador expresses an interest. If you don't do this, they won't know that you want them to come! Most of our STEM Ambassadors work full time. The quicker you offer them a position, the more likely they are to be able to make arrangements to support your activity.

PREPARATION MAKES PERFECT



Communicate and collaborate with your STEM Ambassador

Once you have found a STEM Ambassador it is important to discuss expectations clearly, so everyone can get the most out of the activity. It is important to remember that **STEM Ambassadors are not teachers**, so will need some classroom support.



Have a conversation early in the STEM Ambassador's planning process, then make contact again when their plans are further advanced. It may help to work through the checklist on the next page. You can download a copy **online**.

Prepare your class

You could:

- ask students to think about questions in advance
- recap their knowledge on the subject that the session will focus on
- send students' questions to the Ambassador in advance so that they can come in with the answers prepared
- talk to your class about behavioural expectations during the activity

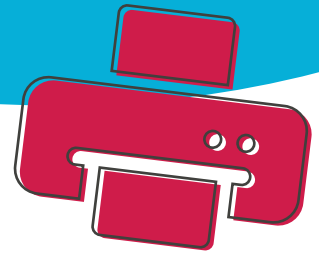
Communicate with parents and carers

Tell your parent body about the STEM Ambassador programme – you can ask your STEM Ambassador if they can provide some information.

You could encourage parents with a STEM background or connection to sign up.



CHECKLIST



Go through the following with your STEM Ambassador:

Communications

Contact names and details? Preferred times and methods of contact?

Audience

Numbers? Ages? Special needs? Behaviour routines (e.g. the best way to get the class's attention, reward schemes for positive behaviour)? Will you need to divide them into small groups?

Note: You will need to actively support with behaviour management and differentiation during the session. If you have any great tips for getting the student's attention please share them on the day – or model them for the STEM Ambassador. **It's important to remember that they are not teachers!**

Activity content

What are your requirements, e.g. format or topic? What will the audience already know? What's on the curriculum? Already done any related activities?

Timings

Dates and times that work for everyone? Activity duration? Timing of any breaks? One-off, or follow-up activities required?

Support

Number of adults needed? Who? Roles and responsibilities?

Location

Size? Facilities? Back-up option (e.g. in case of wet weather for an outdoor activity)?

AV

AV facilities required? Plug sockets? Need to bring anything (e.g. own laptop)? Need to send PowerPoint / film in advance to test?

Resources and equipment

What is required? Who will supply it?

Safety

If there will be a practical activity, are you comfortable with the STEM Ambassador's plans? Do any students or supporting adults have relevant allergies? Do you need to check with CLEAPSS / SSERC? Will you do a risk assessment? Does the subject matter cover any potentially sensitive areas?

Note: Health and safety remains the ultimate responsibility of the teacher and school or college.

Arrival and set up

Parking? Arrival time? Who should the STEM Ambassador ask for when they arrive? Will they need to bring ID / their DBS or PVG certificate? Access to the venue before the session starts to set up?

After the session

How much time and space will be available for pack-up? How can you / your students provide feedback?

FEEDBACK IS CRUCIAL TO THE PROGRAMME'S SUCCESS

Feedback is vital to the STEM Ambassador programme. It helps:

- **you and your STEM Ambassador**, to see the areas you can improve on if working together in future
- **STEM Learning**, to measure the impact of the STEM Ambassador programme on young people
- **young people**, as feedback is vital in securing ongoing funding to keep the programme going

Ways to feedback

Young people

The STEM Ambassador may use the **STEM Ambassador Impact Tool** to gather feedback from young people at the end of the session quickly and easily. They mark their agreement to four statements using a 4-point scale.

You and the STEM Ambassador

Feedback online via the STEM Ambassador website.

Make time for a **debrief**, preferably face to face immediately afterwards or as soon as possible over the phone.

Discuss future activities, what could you do together in the future, could you utilise the wider network of STEM Ambassadors? Their company, institute, connections?

Share your stories and photos on **social media** – but don't post a photo without everyone's consent (see your organisation's photography guidelines).

@STEMAmbassadors **#STEMAmbassadors**

If you have not had the experience you expect, you can also contact your Hub directly.

The STEM Inspiration Awards

STEM Learning's STEM Inspiration Awards recognise and celebrate the work that individuals, youth and community groups, and employers do to inspire young people in STEM.

Free to enter, this annual award scheme offers individuals and organisations from every area of STEM, including STEM Ambassadors and inspirational STEM Clubs, the chance to shine.



CASE STUDY

STEM Ambassadors bring learning alive



School: St Mary's Primary School, Edinburgh, Scotland

Age group: Primary 5 and Primary 7

St Mary's got in touch for support with organising their first STEM Week in autumn term. Their local STEM Ambassador Hub organised for volunteers to visit the school, delivering workshops, talks and activities.

The event was so successful in raising the pupils' aspiration across Science, Technology, Engineering and Mathematics that they have kept up the momentum and participated in a wide range of workshops and school trips with STEM Ambassadors throughout the year.

- Their Primary 7 class visited Forth Bridges Education Centre to take part in interactive construction challenge workshops and learn about engineering and the Bridges over the Forth.

- Their Primary 5 class enjoyed two engaging careers talks from a Marine environmental consultant and a clinical scientist, learning about red and white blood cells by getting hands-on with play dough.
- Another class had a visit from the Glasgow Science Centre, investigating the role of oxygen in a healthy body through some very active games!

The teachers at St Mary's said that STEM Ambassadors were able to bring learning from the classroom alive, demonstrating real-life application in people's day-to-day work and careers, and widening their own knowledge of STEM subjects and practice.

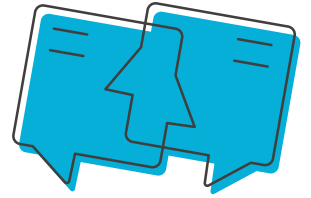
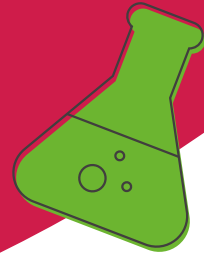


It has challenged stereotypes and instilled a more 'can-do' attitude for STEM subjects and 'why not me?' The variety of challenges and activities with a range of different STEM Ambassadors meant that the pupils were really excited and enthused about what each day would bring."

Teacher, St Mary's Primary School

CASE STUDY

Making the link between science and everyday life



School: Two primary schools in Northern Ireland

Age group: Primary 7

Neill's Flours and Allied bakeries joined the STEM Ambassador programme as a new employer in January 2019 with an idea for a flour-to-bread workshop for primary school pupils. Their STEM Ambassador led the design, planning and outreach of the initiative, which aimed to show Primary 7 pupils the science around how the grain is milled into flour, the proving of the dough, and the chemistry behind this and the finished product, as well as highlighting the healthy eating aspect.

A STEM Ambassador started this as a pilot with two primary schools within Northern Ireland – one primary school from a Catholic area and one from the Protestant sector.

The children who participated were really enthusiastic, and unanimous in their positive response when asked whether the workshop showed how science and food are connected.



It was really good fun – the balloons exploding was really funny. I didn't know that bread could do this when it was dough! I didn't know there was science in bread."

Students, Victoria Park and St Joseph's Primary Schools



CASE STUDY

Creating an 'engineering buzz' with the help of local businesses



School: Aylesford School, Kent

Age group: Years 7, 8 & 9

Aylesford School invited STEM Ambassadors from local Engineering firms to support them with their 'Create an Engineering Buzz' event, over three days in summer term.

The Ambassadors delivered interactive, engaging workshops for all students in Years 7, 8 and 9, including:

- Bridge Design and Construction
- Computer Simulations

- K'nex Roller Coaster
- The day in the life of an engineer
- Welding with Chocolate
- BBC micro:bit traffic lights
- Paper Rockets

Students thoroughly enjoyed the day and 86% said they had a better understanding of engineering careers as a result.



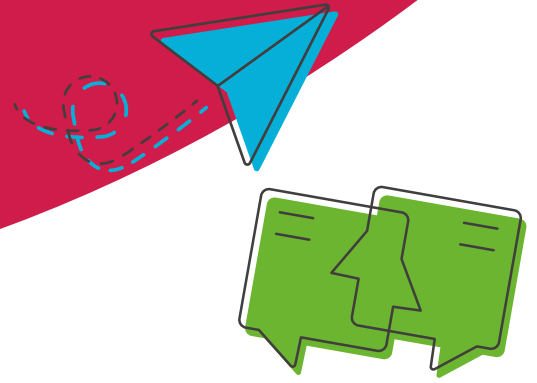
Starting this course, I had no intention of doing an engineering-based job. However, doing this course has now given me an open mind and I now see differently from what I did. This course not only gave me the opportunity to experience some engineering, the staff were very professional, giving a good day."

Student, Aylesford School



CASE STUDY

Delivering 'Generation STEM'



School: 150 secondary schools across South-West England

Age group: Year 10 students

Two STEM Ambassador Hubs in South-West England delivered 'Generation STEM' – a two-year project being evaluated by the National Federation for Educational Research, which aimed at identifying Year 10 students who would benefit from STEM work experience. There were three stages to the project:

Schools across the South-West of England received a Year 10 work preparation day, consisting of a series of workshops in small groups with a STEM Ambassador mentor.

Fifteen students per school were identified, based on who was likely to gain the most from a Generation STEM work experience; and were interviewed by a member of the Hub Team and a STEM Ambassador.

Five students per school were selected for a Generation STEM work placement. This comprised a week in industry (in a local STEM company) completing a project, and an Industrial Cadets Award.

The University of Bath (Department of Water, Environment & Infrastructure Resilience) hosted a student from The Blue School. The university was so impressed with the student's motivation and confidence that he was funded to attend the Young Marine Biologist's summit in London, where he presented his project and his experience of the work placement.

Schools particularly liked the Year 10 work preparation day, and several have requested support for future events.



I am REALLY pleased to hear that our student fully engaged in the placement. She doesn't always see the point of school, it doesn't seem relevant to her, so often we have a lot of lateness and missed days. I hope that her time with you will now give her a reason to improve – a real picture of what she can achieve outside of school."

Teacher, St Peter's High School

