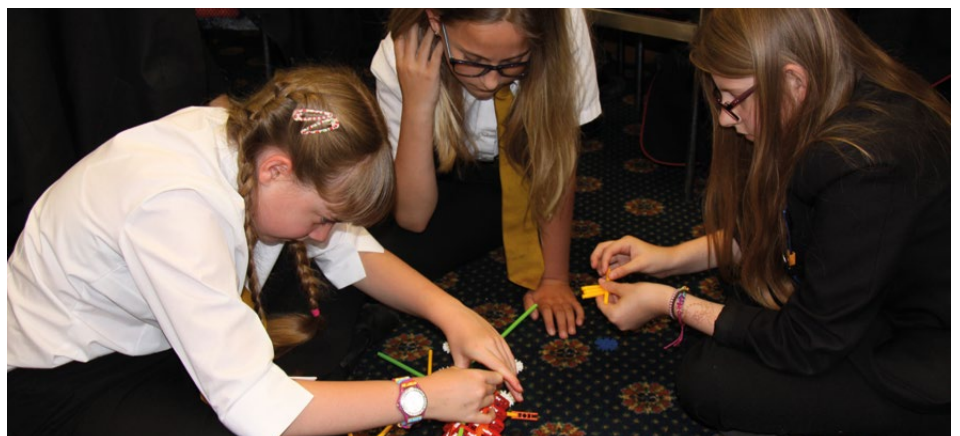


Inspiring the next generation

Engaging young people in science, technology,
engineering and mathematics (STEM)

A GUIDE FOR SMALL BUSINESSES



in partnership with



Inspired. **By you.**



Do you remember who inspired you when you were at school? There are young people sitting in classrooms today looking for positive role models to help them on their path. Could you or your colleagues be the role models these young people are looking for? Could you help them into a career where they provide the solutions to the world's most challenging problems?

The purpose of this guide is to show how easy it is to connect your business with local schools and young people and the wealth of benefits you will get from doing so. This guide is aimed at businesses in the Science, Technology, Engineering and Maths (STEM) sector.

The benefits to you and your business?

Engaging with young people is beneficial for you and your business on so many levels.

It enables you to...

- Raise your Company profile
- Increase your reputation
- Present yourself as an employer of choice in the community
- Recruit motivated, high quality future employees
- Help tackle the UK STEM skills shortage
- Encourage more female students into STEM
- Build a diverse workforce
- Give your employees new experiences and development opportunities
- Give something back to the community
- Make connections with the teachers, parents and young people in your local area
- Involve your employees in life changing work
- Inspire the next generation



“As STEM employers, it is our responsibility to inspire, educate and support the next generation, entering the STEM industry for their careers. To ensure the UK has a sustainable talent pipeline we cannot just focus on our own organisation’s future talent, but also the future talent for the organisations around us, our supply chain, and our partners in the extended enterprise. It’s about making whatever time we have available to support schools and pupils of any age and inspiring them to follow into the industries in which we have built our own careers.”

John Whelan

HR Director, BAE Systems

Why should I get involved?

The STEM sector is vital to the future of the UK economy, with engineering alone accounting for 26% of the UK’s GDP¹. However, the UK has some serious STEM skills shortages. A CBI² report found that:

- There is a widespread lack of qualified technicians and graduates with STEM skills, particularly for businesses that work in engineering, technology and science
- 39% of STEM business have difficulties recruiting employees with STEM skills

EngineeringUK’s 2017 report also identified that:

- Women are considerably under-represented in the STEM sector, with only 1 in 8 of those employed in engineering being female³

It is widely known that the UK STEM sector faces significant challenges. It is therefore the role of every STEM employer to encourage and inspire the next generation to take up careers in STEM to secure talent for the future.

¹ Engineering UK (2017) *The state of engineering*, p.2. Available at: <http://www.engineeringuk.com/media/1355/enguk-report-2017.pdf>

² CBI Education and Skills Survey (2013) *Changing the pace*, p.6. Available at: http://www.ucml.ac.uk/sites/default/files/shapingthefuture/101/education_and_skills_survey_2013.pdf

³ Engineering UK (2017) *The state of engineering*, p.8.

How can I get involved?



“There are very many ways that your company can engage with the next generation through your schools outreach work, and you will find that these engagements not only enrich your own employees and your status and visibility in the community, but contribute to the security and supply of our future engineering talent.”

Dawn Bonfield MBE

Women's Business Council

There are so many ways that your employees can engage with young people to inspire them into STEM; just some of the ways include:

- giving careers talks or helping at careers fairs, mock interviews or CV workshops
- mentoring young people
- hosting workplace visits
- supporting enterprise/ engineering activities and competitions
- supporting school lessons by bringing real-world problems into the classroom
- supporting the STEM skills curriculum in local schools

The best and easiest way for your employee's to get involved in all of these activities is to become a **STEM Ambassador**. The STEM Ambassador programme is specifically set up to link businesses with schools so it's a straight forward way for your employees to get started.

An amazing 30,000 STEM Ambassadors, from over 2,500 different employers, volunteer their time, enthusiasm and experiences across the UK to encourage and inspire young people to study STEM subjects and take up careers in the sector.

STEM Ambassadors come from a variety of backgrounds, and can include anyone who is willing to share their own interest, skills and experiences of STEM.

What would being a STEM Ambassador involve?

STEM Ambassadors can get involved in a wide variety of activities to suit their time commitments and interests. When employees sign up they become part of the STEM Ambassador nationwide volunteer network. They are then contacted when schools in the local area need support running STEM activities. There is no obligation for Ambassadors to support every time, but the more your business can invest in young people, the more benefits you will get out of it.

To register, visit the **STEM Ambassador** website and follow the short registration process, using the link below:

<https://www.stem.org.uk/stem-ambassadors/ambassadors>

There is also a **construction Ambassador programme** which focuses on inspiring young people into the construction industry specifically:

<https://www.goconstruct.org/information-for-employers/construction-ambassadors/>

STEM Learning provides an online, or face to face **induction** for new STEM Ambassadors, and offers **training and support** to help people develop in their role. They provide access to a range of training and resources on their website:

<https://www.stem.org.uk/stem-ambassadors/training>

An employee's view of being a STEM Ambassador



“Being a STEM Ambassador has given me an exceptional opportunity to work with my local school. It helps support our site with its local apprentice recruitment activity and it is so rewarding to have the positive feedback of the students and teachers. It is very much a highlight of my job!”

Blossom Hill

Apprentice of the Year 2016, BAE Systems

STEM Resources to use in schools

There is a fantastic range of quality resources that your employees can use to support, or lead STEM activities being delivered in schools.

The **National STEM Centre** is set up to ensure all young people experience world-leading education. Their website hosts a huge range of STEM resources for both employers and teachers.

<https://www.stem.org.uk/resources>

SEP (science enhancement programme) develops innovative, low-cost resources to enhance secondary science education. They have developed a **learning skills for science programme** for 14-16 year olds which contains resources and materials to help students learn.

<https://www.stem.org.uk/elibrary/collection/3623>

SEP also publish **Catalyst magazine** which is available freely online through the National STEM Centre. This topical science magazine for students aged 14-19 years brings science to life with insights into cutting-edge research and practical applications.

<https://www.stem.org.uk/catalyst>

The royal pharmaceutical company have also produced some great resources online for people giving career talks at schools or career fairs. On their website they have a careers presentation anyone can use **‘interested in pharmacy?’** and a leaflet which can be shared with students aged 14-18 interested in a career in pharmacy.

<https://www.rpharms.com/resources/careers-information>

They have been tested with employers, teachers and of course young people and they work!

Engaging children of different ages in STEM

See below some fun activities to engage children of different ages in STEM.

You can help inspire young people and get them involved with STEM activities at any point in their education, even children as young as five – in fact, younger children are often more likely to be inspired and influenced as they won't have yet determined a path for themselves.

Primary (Age 5–7)

Visit the **STEM Learning** site and search under Primary to find activities for children aged 5 to 7.

CREST Megastar activity: There's a hole in my bucket. Encourages children to investigate different materials and approaches to mend a hole in a bucket.

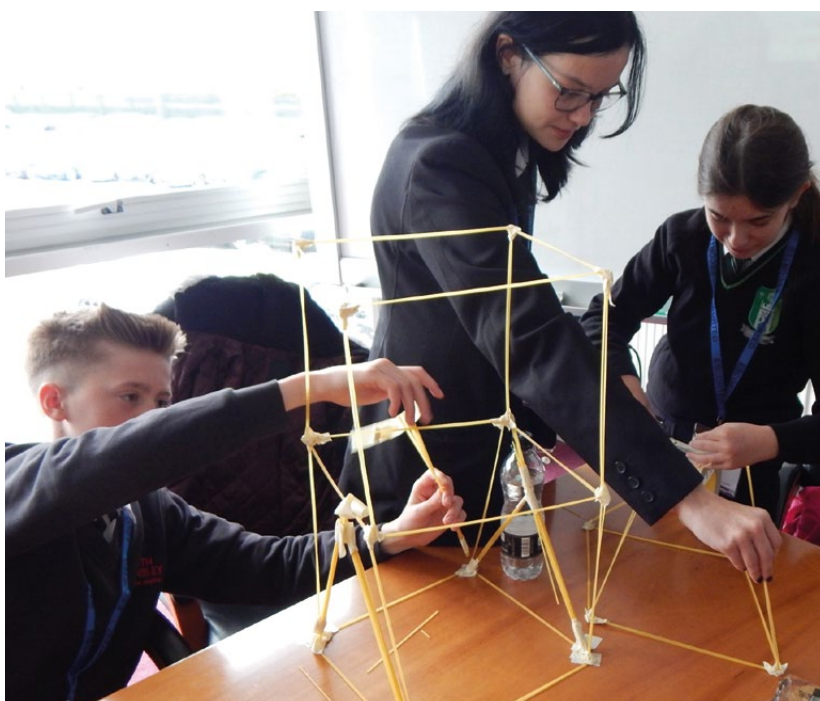
Instant ice cream: This activity investigates the properties of different states of matter and how they look and behave differently by mixing the right mixture for ice cream and making it cold enough without the aid of a freezer.

Secondary (Age 11–14)

Visit the **STEM Learning** site and search under Secondary to find activities for children aged 11 to 14.

MRI scanning: a science activity investigating the super magnets used in MRI scanning machines. Can MRI scans discover if you're telling lies?

Colouring maps: This math's activity is based on the four colour theory, which is used by mapmakers. There is an interactive task which challenges students to colour a map using no more than four colours and ensuring that no two regions which share a border have the same colour.





Guidance to help you promote STEM careers to female students

There is a wealth of expert guidance that has been produced to help employers engage specifically with female students. The links below provide guidance that is relevant for all STEM industries.

The WISE: Women in science and engineering campaign website contains a number of reports on language and communication strategies that effectively inspire female students. For a start, look at the resources 'People like me: pathways to apprenticeships', and 'Engaging girls in STEM: what works'.

<https://www.wisecampaign.org.uk/resources/tag/resources-for-companies>

Another place to visit is the **Women's Engineering Society (WES)** website. This features a range of reports and gives practical advice on the do's and don'ts of engaging female students. Their 'Positive Action' – how to attract more women as employees' guide is particularly helpful.

<http://www.wes.org.uk>

Lastly, it is worth mentioning that **SEMTA** (science, engineering and manufacturing technologies alliance), **WISE** and the **ICE** (Institution of Civil Engineers) have produced a toolkit that shares best practise, expertise and case studies. It covers how to attract, engage, support and retain women in STEM apprenticeships:

<https://www.wisecampaign.org.uk/apprenticeship-toolkit>

Involve a successful STEM role model in your business that young people could immediately connect with



"Signing up to be a STEM Ambassador has provided me with the opportunity to go out into the local community for a few days each year, whether it be at air shows, science fairs, career events or local schools, to talk about the benefits of studying STEM subjects and the broad range of careers it can provide. I really enjoyed being able to dispel the myths and stereotypes and enlighten the students on how they can be an engineer too. I always love the look of shock on people's faces when I first tell them I'm a systems engineer!"

Samantha Surmon

Systems Engineer, BAE Systems STEM Ambassador



“My work experience gave me an insight into what it would be like working in the MTC. It broadened my horizons as to some of the many different career paths that are available within engineering and redoubled my enthusiasm for the field and my determination to do well in my exams to achieve my ambitions. It also exposed me to people who are enjoying their work and has provided me with some role models that I would like to emulate.”

Georgina Crook

Work experience student at The
Manufacturing Technology Centre Ltd

Work Experience

The very best insight into work is provided by work experience, which can really bring to life what work in a STEM setting actually involves. It is typically aimed at students aged 14-16 and 16-18.

Every employer should support and help young people by offering work experience. It's a great way for them to see and experience, hands on, the variety of roles in STEM; helping them to make informed decisions early on.

It also provides a stepping stone into longer term work. To be successful in today's world, education is often not enough; young people typically need relevant work experience to get a job at an apprentice or graduate level. Giving students an insight into your business, and enabling them to put experience on their CV could be life-changing for a young person.

It can also offer a great opportunity for your employees to develop mentoring skills, and can enable you to bring in future talent. It doesn't have to be difficult or complicated, and it can be anything to suit your business's time commitments, from one to two weeks, or just a few hours.

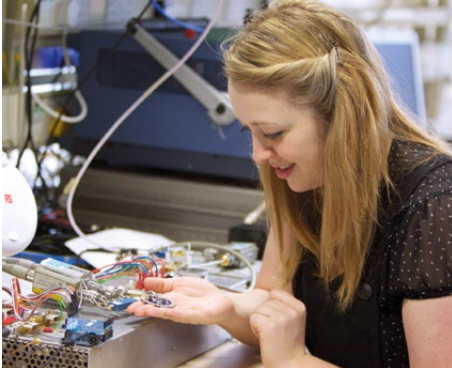
There are plenty of resources that you can use to get started offering work experience:

- **STEM Learning** has a useful guide that is designed to help employers develop good-quality STEM placements for young people aged 14 -19. It contains work experience examples across a range of different size businesses.

<https://www.stem.org.uk/elibrary/resource/26623>

- **Goconstruct** have also produced a useful guide to make it as easy as possible for construction employers to provide work experience. It contains a useful one week work experience plan, and provides great guidance on making work experience effective, using feedback from young people, and case studies.

<https://www.goconstruct.org/information-for-employers/resources/dashboard/careers-educational-resource-toolkits/guides-video-resources/work-experience-guide/>



It is also worth highlighting **Take your Sons and Daughters to Work Day**, which encourages employees to bring their 14-16 year olds into their companies for one day, (usually in April), to experience the world of work with their parent.

The **WISE (Women in science and engineering)** Campaign has provided some helpful guidelines around maximising the benefits for daughters:

<https://www.wisecampaign.org.uk/events/433-bring-yourdaughters-to-work-week-24th-27th-april-2017>

Some other good ideas for collaboration

STEM Ambassadors for your company could also support the following:

- **The Big Bang.** This is a national showcase at the NEC Birmingham to promote STEM careers to young people which now engages an amazing 80,000 young people over four days each year and is held in March.

<http://www.thebigbangfair.co.uk/>

- **STEM Learning** Teacher Placements. Opportunity to host teachers for work experience in your organisation to help them to get a better understanding of STEM careers.

<https://www.stem.org.uk/stem-insight>

- **The Engineering Development Trust (EDT).** This is a charity working with young people aged 9-21 across the UK to deliver STEM related experiences from STEM days in school to industry-led projects and industrial placements.

<http://www.etrust.org.uk/>



“Such is the importance of engineering to our future that we need to ensure we have a constant supply of engineers and scientists – we cannot afford to leave it to chance. Therefore, it is vital that we, as responsible employers and ambassadors of engineering, do everything we can to not only promote STEM subjects but emphasise their importance and the careers it can lead to. Currently, women only make up a small per cent of UK engineers but it is vital that we have a good gender and ethnic balance because the best engineering solutions will be determined by teams with diverse interests and backgrounds.”

Dr Clive Hickman FREng

Chief Executive, The Manufacturing Technology Centre Ltd

Other Handy Links



Careers and Enterprise Company: is the national network that connects schools and colleges, employers and career programme providers to create high-impact career opportunities for young people. It supports sustainable connections between these groups and provides funding, research and evidence on what works best in careers and enterprise.

<https://www.careersandenterprise.co.uk/>

Business in the Community (BiTC): is the Prince of Wales's 'Responsible Business Network' which offers a range of practical ways for businesses to work together and take action to help tackle some of the key issues facing education and society.

<http://www.bitc.org.uk/>

Generating Genius: supports talented young people from disadvantaged backgrounds to realise their potential in STEM through challenging programmes which build self-discipline, positive behavior and improve academic performance.

<http://www.generatinggenius.org.uk/>

The Science Museum: based in London and aims to promote science at all levels and has a fabulous website with a rich range of resources for schools.

<http://www.sciencemuseum.org.uk/educators>

Association of the British Pharmaceutical Industry

<http://www.abpi.org.uk/our-work/careers/Pages/default.aspx>

Royal Society of Chemistry:

<http://www.rsc.org/careers/future/>

Sentinus STEM career links and STEM careers booklet

<http://www.sentinus.co.uk/stemcareers/>

EngineeringUK: has a key role to promote career opportunities in engineering to the next generation. It does this primarily through its Tomorrow's Engineers programmes which connect employers and their employees to schools and young people.

<http://www.tomorrowsengineers.org.uk/>

SEMTA: the sector skills council for advanced engineering and manufacturing. Its website has some very helpful careers pathways guides and it provides an excellent overview of engineering apprenticeships

<http://semta.org.uk/>

