

Advancing **STEM** careers provision in schools

A guide for
Careers Leaders



Engineering and technology

The careers of the future

“STEM careers provision is key to inspiring the next generation of engineers and technologists, ensuring the UK’s workforce is equipped to meet the future demands of the economy.”

Dr Hilary Leever, Chief Executive, EngineeringUK

A strong and diverse engineering and technology workforce is vital to the UK economy and efforts to achieve net zero. Skills are needed in all sectors, from creative and digital, health and big data to advanced manufacturing, energy and aerospace.

Engineering and technology jobs are predicted to grow in all UK regions between now and 2030 – faster than any other occupation.

Unfortunately, employers are reporting skills shortages and difficulties recruiting, **and only around 16% of the UK engineering and technology workforce is made up of women.**


STEM careers provision in schools and colleges across the UK needs to be robust and inclusive, aligning with UK government’s strategic approach to skilling the workforce of the future.



Who this guide is for

This guide aims to support those responsible for careers programmes in schools to enable students from all backgrounds to view engineering and technology as an exciting, meaningful and accessible career option. It offers practical tips, grounded in the latest research, to help career leads bring to life the dynamic world of STEM.

How to use this guide

 Throughout the guide you will see this icon showing an actionable top tip.

The content in this guide aligns with the Gatsby Benchmarks (England) and Careers Education Standard (Scotland).

Creating a progressive, engaging and impactful STEM careers programme



Identify people who champion STEM careers, such as parents and carers, students, teachers, employers, senior leaders, governors and STEM organisations. This is an integral network of people to consult in the planning and delivery of your STEM-informed careers programme.



Create links with the school development plan

Demonstrate how the school’s careers programme is purposeful, focused and tailored by bringing to life STEM careers at various points in a young person’s school journey.



Use the CDI Career Development Framework to drive a holistic approach to careers provision in school. [theCDI.net/resources/cdi-framework](https://the CDI.net/resources/cdi-framework)



Encourage interest beyond the classroom

Exploring different careers outside of school, through passions, interests, skills and school subjects supports careers learning.



Share ‘My world, my future’ with students and their parents/carers - a free, downloadable leaflet which lists podcasts, days out, activities, competitions, books and other ways that young people can further their interest in STEM.

eukeducation.org.uk/my-world-my-future



Engage parents/carers throughout

Consider how to support and include young people’s influencers in your careers programme.




Share this guide with parents and carers at options evenings, parents’ evenings and careers events, and make it available on your school’s website:

eukeducation.org.uk/parent-carer-guide



Make content understandable and accessible on your website

 Promote the school careers programme on the school website, including links to campaigns, STEM programmes and activities, specifying opportunities for employers, parents and carers, and the wider school community to engage.

 Examples:

Tomorrow's Engineers Week

eukeducation.org.uk/tomorrows-engineers-week

Big Bang Programmes
thebigbang.org.uk


This is Engineering
thisisengineering.org.uk



Demonstrate the impact of careers programmes

Seek to evidence progress at a whole school level and link evaluation data to the school development plan's objectives.

Each UK nation has developed its own guidelines, frameworks and standards for what constitutes good careers education and guidance.

 Use the CDI briefing, 'Quality Assurance for Careers Education and Guidance in Schools and Colleges', to navigate and select the quality measures, activities and outcomes that best suit your school.

careersleaders.thecdi.net

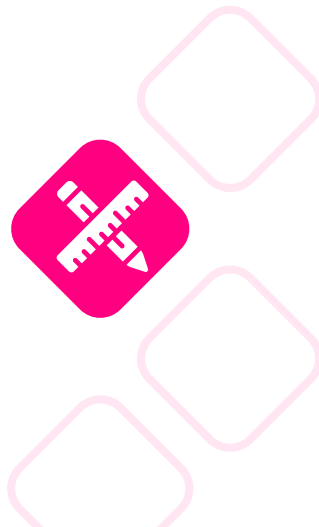


Create STEM funding opportunities for your schools

Explore bursaries that help inspire students who may be less familiar with STEM, especially those young people from underrepresented groups in engineering.

Find out more about bursaries

eukeducation.org.uk/funding



Learning from careers and labour market information



There's high demand for engineers in the UK. From apprentices to technicians and graduates to postgraduates – engineers are needed at all levels, in a wide range of sectors.

Career readiness


Increasing awareness of the changing labour market – especially in the context of engineering and technology – strengthens students' approaches to their own transitions and helps with career readiness.

The highest quality careers education can – and does – compensate for starting disadvantages amongst students. It also leads to career interests that are better aligned with the labour market. For example, "Girls with a 100% career readiness score are twice as likely to choose engineering."

The Careers & Enterprise Company, Insight briefing: Student careers readiness in 2023/24

Access to good quality, up-to-date careers information

Bring STEM to life with exciting resources designed for young people by industry and careers experts.

 Quickly find trusted, high quality resources on resource directories:

resources.careersandenterprise.co.uk
marketplace.skillsdevelopmentscotland.co.uk/offers

 Explore the wide range of resources on EUK Education:
eukeducation.org.uk/careers

 Engineer Your Future (presentation)
eukeducation.org.uk/engineer-your-future

 100 Jobs in STEM (poster)
eukeducation.org.uk/100-jobs

 Meet the future you (quiz)
mtfy.org.uk

Addressing the needs of each young person

Around 6.3 million people in the UK are employed in engineering and technology but there are significant skills shortages and workforce challenges, including a need for more diversity.

Engineers at all levels are in demand, from apprentices to technicians, graduates to postgraduates. It's one of the few career options that spans every sector, from sport to space.


The UK needs people from all backgrounds and differing abilities to follow their passion and use their unique, creative minds to improve people's lives through engineering and technology.

Adopting an inclusive, whole-school approach to careers provision will support each young person's career aspirations, within and outside of the curriculum. Create a range of STEM opportunities throughout your careers programme, that enable young people to explore and suggest solutions to global challenges (such as reducing carbon emissions). Help young people build connections between STEM and the world around us, repeatedly and in a variety of meaningful ways.

Take a targeted approach

To support an equitable approach to careers programming, tailor support and strategies to engage more young people from specific groups underrepresented in certain areas of the STEM workforce and/or young people who have additional barriers or factors which could lead to disadvantages.

Determine gaps, needs and patterns of careers interest in STEM, at a whole school and individual level. Tailor access to STEM careers information and create practical opportunities for students to experience STEM first-hand, in a way that links to their own lives.

 Use research such as the rapid evidence reviews to inform the design of your careers programme.

engineeringuk.com/rer-girls



Linking careers learning


Take an evidence-based approach

Utilise EngineeringUK research to help you design a careers programme that supports a wide-ranging, sustained selection of activities throughout a young person's school journey: engineeringuk.com/research-and-insights

Young people (age 12 to 15) choose engineering based on:

- awareness and enjoyment of engineering
- experiencing engineering role models
- receiving engineering-specific careers advice
- finding their STEM teachers inspiring


Young people that take part in STEM-based activities are more likely to be interested in a STEM career than those who don't.

 Use the EUK Education calendar of key dates to plan STEM inspiration into a range of curriculum areas:

eukeducation.org.uk/dates

Champion STEM in all subjects


Entry and progression routes into engineering careers vary. Whilst engineering pathways typically align with maths, science (often physics) and subjects such as D&T, computing, electronics and construction, it is important that young people learn that other subjects (like geography, art and languages) are also valued by engineering degree courses and employers.

 The Climate Schools Programme is designed to show how multiple school subjects such as English, science and geography, interconnect through engineering and technology.

eukeducation.org.uk/climate-lessons

Recent research has identified that there is a decline in hands-on practical science in the classroom, yet "Practical science is a key motivator for young people studying science in years 7-9"


The Science Education Tracker 2023 (The Royal Society and EngineeringUK)


 Use the Neon website neonfutures.org.uk a directory to help bring practical science to life and create impact with project-based activities.



Wider world connections and skills for engineering

Highlighting the connections between skills and employability can help young people determine the relevance of their school subjects to their career options. Skill development is key to social mobility and helps young people to become effective workers by building awareness about the transferability of skills.


 Learn more about The Skills Builder Universal Framework skillsbuilder.org/uf2 - a tool for measuring and building essential skills which provides a shared language for schools, employers and young people.


 Encourage the use of Skills Builder Careers Explorer tool to discover the skills combinations that are sought after in STEM roles. skillsbuilder.org/essential-skills-profiles

Skills engineers use:

Engineering skills are highly transferable and will always be in demand.

-  Creativity
-  Teamwork
-  Open-mindedness
-  Social conscience
-  Communication
-  Determination
-  Problem-finding and solving
-  Innovation

 At key transition points create deliberate and practical ways to bring engineering skills to life. Raise awareness for young people and their careers influencers.

 Share the booklet, 'Engineering and technology: the key to the future' at options events, careers days, guidance sessions and parents' evenings: eukeducation.org.uk/engineering-and-tech

 Display the 'green careers in engineering' posters and postcards and use the activities and case studies to inspire students: eukeducation.org.uk/green


Workplaces and people in STEM

Students are shown to benefit greatly from employer encounters, especially if these take place annually, enabling employers to build on their engagement with younger secondary school audiences.

School relationships with local employers can be supported through careers hubs (in England), Employer Careers Education Groups (in Scotland) and volunteer programmes and/or networks that operate throughout the UK, like STEM Ambassadors. stem.org.uk/stem-ambassadors

Employers are seeing direct benefits from engaging with careers education. "91% of the most engaged employers say it is helping them develop new talent pipelines and is supporting young people to take up careers in their industry"

The Careers and Enterprise Company, Careers Education 2022/23: Now and next

 Build a network with local STEM employers to realise encounters for young people. Common role titles of people who support careers education are: Early Careers Manager, Social Value Manager, Emerging Talent Manager.

Women are the most underrepresented group, making up around 16% of workers compared to 56% in other sectors. We need more girls to see a future for themselves in engineering and technology.

Encourage employers to make the interaction meaningful by supporting the interests of young people; e.g. for girls consider topics which are known career motivators, such as demonstrating how a career pathway benefits society, helps others or tackles climate change.


The Science Education Tracker 2023 (The Royal Society and EngineeringUK)



Green jobs

Many new roles will be created, and existing job roles will adapt to the emergence of the green economy and clean technologies. Green jobs are found in lots of different sectors and involve protecting or restoring the environment with a core aim of helping people work and live in ways which are sustainable. Engineers and technicians are shaping the world by working towards the Global Sustainable Development Goals (SDGs).


 Explore green skills and jobs: greencareershubs.com and use these occupational maps to explore green jobs: occupational-maps.instituteforapprenticeships.org

 Empower tomorrow's workforce by introducing your school to the local Climate Ambassador (and/or STEM ambassador). Together, your students will explore the ways STEM professionals are tackling climate change, and how this could be a future career for them.

climateambassadors.org.uk

Role models in context

Showcase a range of role models and raise aspirations by challenging misconceptions, bias and stereotypical thinking.

 Explore different job roles including engineer, scientist and technician:

thisengineering.org.uk

eukeducation.org.uk/real-jobs


lightyearfoundation.org/role-models
(inclusive role models)

technicians.org.uk/role-finder

Exploring STEM working environments

Encourage trips and visits to facilitate young people's exposure to the world of STEM. Ask your local careers hub or other networks about upcoming careers opportunities with local STEM employers.

Some STEM workplaces aren't suitable for young people to visit and explore.

 Utilise the wide range of virtual experiences developed by industry and brought to life on various careers platforms for young people to access employer settings on-demand.

neonfutures.org.uk/experiences

Visit museums and STEM showcases or events e.g.

sciencemuseum.org.uk/see-and-do/technicians-david-sainsbury-gallery

Find a STEM festival near you:

sciencefestivals.uk/festival

Find a Science Centre near you:

sciencecentres.org.uk/centres

Experiences of workplaces

Work experience provides opportunities for young people to practice, showcase and build demonstrable examples of skill development in wider world application. Practical careers learning helps contextualise and bring to life:

- entry routes into STEM
- growth sectors
- where skills shortages are prevalent
- the changing economy
- the variety of roles and responsibilities available


Build multiple, varied and targeted experiences throughout a young person's education journey to help them make informed choices, improve career readiness and employability.

Use current best practice guidance, such as equalx (in England):

careersandenterprise.co.uk/modern-work-experience

Encounters with further and higher education

Young people need to understand the variety of further education learning environments so that they are able to choose a STEM learning pathway connected to their interests and learning styles. Providing impartial information about a full range of learning options in academic, technical and vocational settings is key to the parity of routes into STEM careers and helps young people navigate their career choices effectively.

 Provide information about the varied work and study options:

From Idea to career (booklet)

eukeducation.org.uk/idea


T Level explorer (leaflet)

eukeducation.org.uk/t-level-explorer

All routes into engineering (booklet)

eukeducation.org.uk/all-routes

Invite guest speakers into school

 Provide young people with first-hand insights and help them to identify pathways based on the experiences of others who have recently navigated different routes into STEM. Engage a range of people who represent the diversity of people who work in STEM. Invite alumni or STEM professionals to share their experiences with students:

stem.org.uk/stem-ambassadors

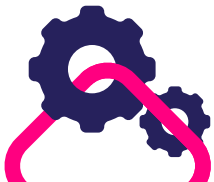
speakersforschools.org

inspiringthefuture.org

Professional registration

Whichever route young people take into engineering, once they have the necessary qualifications and skills developed in the workplace they can apply to become professionally registered with a professional engineering institution, allowing them to be recognised globally as having met the high standards of engineering professionalism. Registration options include: Chartered Engineer (CEng), Incorporated Engineer (IEng) and Engineering Technician (EngTech).

Find out more:
engc.org.uk/professional-registration/guide-to-professional-registration



Moving STEM careers education forward

- Utilise a wide range of careers resources, programmes and experiences to support careers learning through your careers programme. A good place to start is:
eukeducation.org.uk
- Support parents and carers with relevant, up-to-date insights and information about routes into STEM. Have a look at:
talkingfutures.org.uk
eukeducation.org.uk/parent-and-carer-guide-to-engineering
- Take a look at the STEM content, activities, resources and toolkits available on the STEM Learning website:
stem.org.uk/secondary/careers/resources
- Take a targeted approach to championing careers in engineering and technology in an inclusive and equitable way. Have a look at:
neonfutures.org.uk/experiences
thisisengineering.org.uk



www.eukeducation.org.uk

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IOP Institute of Physics



 Royal Academy of Engineering



IET The Institution of Engineering and Technology

THE CAREERS & ENTERPRISE COMPANY