

Tomorrow's Engineers

Careers information resources

for use with young people

What's in the pack? How to use these resources

These resources are for use with young people. This leaflet covers some key points that you may like to consider if you are talking about engineering careers with young people.

Postcards and activities

Inside the pack you will find suggested activities highlighting exciting jobs in science, technology, engineering and maths. All materials are provided. You will also find a series of themed postcards for students featuring modern examples of engineering from a range of industries, including **satellites, surgical robots and smart fabrics**. These can be used to facilitate discussions about current and future world challenges, such as **reducing waste, enabling space tourism and finding transport solutions for congested cities**.



Lesson Plan

A curriculum-linked lesson plan, teacher workbook, classroom display poster and student worksheet, on the theme of disaster response.



Posters

Classroom display posters showing, exciting future career opportunities in science and engineering.

Leaflets

Leaflets for students describing the different areas of engineering and the various routes into the sector.



Ordering copies

Additional copies of the resources can be requested from the Tomorrow's Engineers website. All of the resources can also be downloaded directly:

www.tomorrowseengineers.org.uk/resources

STEM Ambassadors can request these resources through their usual point of contact in their Professional Engineering Institution.

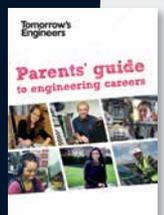
Website

The accompanying website www.tomorrowseengineers.org.uk has lots of information for students, teachers and advisers about engineering careers, including PowerPoint presentations, filmed case studies depicting young engineers and career route maps.



Careers/options evenings

You can order free of charge careers leaflets from the website to distribute at careers/options evenings at school, including a very useful leaflet specifically aimed at introducing **parents** to engineering careers.



Engineers are in demand

Did you know engineering is one of the most in-demand jobs globally?

Gatsby Career Benchmarks

Through careers resources, programmes and activities, Tomorrow's Engineers can support schools to meet many of the Gatsby Career Benchmarks, particularly around encounters with employers, linking curriculum learning to careers and learning from career and labour market information.



Talk about engineering

Frequently asked questions about engineering careers

What is engineering?

Engineering is about making a difference to the world by solving problems, improving things and designing things. It is the practical application of maths and science, combined with other subjects such as computing and design and technology.

What does an engineer do?

Engineers can be involved in building, testing and designing; they might work on large products like air craft; small products like smart phones; buildings or infrastructure; energy sources such as wind power or nuclear power; computing systems or software; transport; medicine; food; music; clothing and much more.

Where do engineers work?

Engineers can work literally anywhere – offices, hospitals, studios, laboratories, power plants, at sea, on film sets, construction sites, in space and underground. They are often employed by companies you may not immediately think of as needing engineers such as food manufacturers or healthcare companies.

What is an apprenticeship?

Apprentices are taken on by a range of engineering businesses. Apprentices typically spend part of their working week with an employer and the remainder at a local college or training provider. Apprentices get paid a training wage and work towards a qualification over a period of 1 to 4 years. Apprenticeships exist at different levels and can be embarked on straight after school, after 6th form or college, or at a later point. Higher Apprenticeships and Degree Apprenticeships can be an attractive alternative to full time study at university. More information on apprenticeships and how to apply is available at: www.tomorrowseengineers.org.uk/apprenticeships

What is a Chartered Engineer?

Chartered Engineers have gained the necessary qualifications and experience to become professionally registered and are able to use the letters CEng after their name. Other recognised professional statuses are Incorporated Engineer (IEng) and Engineering and ICT Technician (EngTech and ICT Tech). Visit www.engc.org.uk for more information and to search for accredited courses.



What qualifications do I need?

- For **apprenticeships or college courses**, good GCSEs (or equivalent) in maths and sciences. Other useful subjects include computing and design and technology.
- For **university degrees and higher or degree apprenticeships**, there are a range of entry qualifications including maths and physics A-level (or equivalent), IB, SB, T-levels and vocational qualifications in engineering, manufacturing, construction, design, digital and other relevant subjects. For chemical or biomedical engineering, chemistry is important. Grades and qualification requirements vary; check the UCAS website www.ucas.com for more information and have a look at the Tomorrow's Engineers booklets contained in this pack.

Are scholarships or grants available?

A wide range of organisations offer grants and scholarships to support budding engineers. Visit the student section of the Tomorrow's Engineers website for more information.

Will I be able to get a job?

Prospects are very bright for students wanting to go into engineering. A recent survey found that **92% of engineering undergraduates** were working or pursuing further study 6 months after graduating.

Apprenticeships are another great route into engineering. There were over 375,000 apprenticeship starts in England in 2018, with an almost 50:50 gender split.

A quarter of a million UK workplaces now offer apprenticeships; a 50% increase in the last five years.

Earning potential

Research has shown that around three in five 11-19 year-olds underestimate graduate engineer starting salaries. The following average salaries will provide a framework for discussions:

- On average, **professional engineers** can expect to earn between 20% to 70% more per year than the typical worker.
- **Engineering graduates** start out earning around 20% more than graduates from other degree disciplines and can expect to earn significantly more over a lifetime.
- **Engineering technicians** earn 12% more per year than the average worker.

Inclusivity

Fantastic engineering careers exist for boys and girls and people from all backgrounds, with many companies actively seeking a more diverse workforce.

It is important to reinforce positive and inclusive careers messaging. Engineers are as likely to be found working in robotics or healthcare as they are on large infrastructure projects such as Crossrail. Providing examples of women and people from BAME backgrounds whenever possible is important, as well as managing groups so that boys and girls have equal opportunities to ask questions.

All the resources in this pack, as well as the careers presentation and 'real jobs' profiles on the Tomorrow's Engineers website, portray a diverse group of young engineers and can be used to facilitate discussions.

When asked whether they thought they could become an engineer if they wanted to, just 60% of girls aged 11-14 said yes compared with 72% of boys.

Role models and examples of engineering

Research shows that young people are most inspired by modern and futuristic examples of engineering. Inviting engineers in to give a talk or to deliver or support an activity can transform the way young people view engineering.

Find speakers, ambassadors or set up an alumni network:

- www.stem.org.uk/stem-ambassadors
- www.inspiringthefuture.org
- www.futurefirst.org.uk

Short, filmed case studies can also be played to young people:

- www.tomorrowseengineers.org.uk
- www.icould.com

Engineer:

Lorena, Product Engineer, Cummins Turbo Technologies
www.tomorrowseengineers.org.uk/Lorena



"I am able to contribute a great deal to improving the level of emissions in the commercial vehicle market, making our environment cleaner. It is all about innovating and making a difference and by choosing an engineering career you have the chance to do that. No two days are ever the same, which makes the job really enjoyable."

Routes in

There is a predicted demand for technician or apprenticeship level skills in engineering. Try to cover **university, apprenticeship and vocational** routes into engineering in your discussions with young people. There are many positive examples of young people who have opted for an apprenticeship route and emerged with a great career path, good qualifications and no student debt.

Equally, complex engineering requires high level skills – often at Master's level or beyond – and young people need to be sure they are choosing the right qualifications if they have a specific career in mind. Continuing with maths and science, especially physics, at A-level (or equivalent) will enhance the range of university courses that students can apply for. The careers leaflets included in this pack may be helpful when looking at routes into engineering with students.

If you require more detailed information about the qualifications that support a career in engineering see the route maps on the Tomorrow's Engineers website – versions for England, Wales, Scotland and Northern Ireland are available to download from www.tomorrowseengineers.org.uk



Apprentice engineer:

Zavier, Civil Engineering Apprentice (Worked on the Queen Elizabeth Olympic Park stadium transformation project)
www.tomorrowseengineers.org.uk/Zavier

"The best thing is seeing it built. After all the work that goes in, just seeing it all come together and being used. That's an awesome feeling."



What next?

Find speakers, hands-on activities and places to visit...

- Attend a science and engineering fair (or hold your own at school!)
www.thebigbangfair.co.uk
www.thebigbangfair.co.uk/nearme
- Enter a project in the Big Bang Competition
www.thebigbangfair.co.uk/competition
- Take part in a Tomorrow's Engineers challenge or workshop
www.tomorrowsengineers.org.uk/robotics
www.tomorrowsengineers.org.uk/energy-quest
- Organise a science, technology, engineering or mathematics (STEM) ambassador visit
www.stem.org.uk/stem-ambassadors
- Organise a school trip:
www.sciencemuseum.org.uk
www.dayoutwiththekids.co.uk
- Find free lesson plans and activities
www.stem.org.uk/resources
<http://stemresources.raeng.org.uk/>



Sources of careers information:

STEM careers information

www.thebigbangfair.co.uk/inspire

General careers information and inspiration

www.nationalcareersservice.direct.gov.uk
www.icould.com
www.prospects.co.uk

Engineering careers quiz for students

Meet the future you is a fun and informative quiz that helps young people match their strengths and passions to careers in engineering:

www.tomorrowsengineers.org.uk/quiz

Also available on the App Store and Google Play



Apprenticeship vacancies

- England: www.getingofar.gov.uk
- Northern Ireland: www.nidirect.gov.uk/apprenticeships
- Scotland: www.apprenticeships.scot
- Wales: www.careerswales.com

University

www.ucas.com
www.whatuni.com



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These careers information resources have been developed by:



IOP Institute of Physics