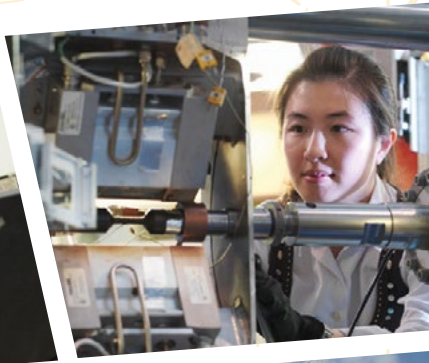
Tomorrow's Engineers

Parents' guide to engineering careers






ENGINEERING
TAKE A CLOSER LOOK

What is an engineer?

Engineers use their creativity and problem-solving skills to improve the design and performance of everything we use today and to develop the products and processes of the future.

Engineers are currently tackling some of the world's most pressing problems. From dealing with cyber security and maintaining clean energy supplies to finding sustainable ways to grow food, build houses and travel.

Why choose engineering?

1. Engineers are in high demand and it's one of the fastest growing sectors
2. Like doctors and lawyers, professionally registered engineers are well respected and well paid
3. Engineers get to be creative, practical and innovative
4. There are exciting opportunities to make a difference in the UK and all over the world
5. It's one of the few career options that spans every sector, from sport to space

Engineers at all levels are in demand

There is a **high demand for engineers in the UK** – in fact engineering is one of the most in demand jobs globally. From apprentices to technicians; graduates to postgraduates – engineers are needed at all levels, in a wide range of sectors.

Between now and 2024, we expect over **2.5 million job openings** to arise in the engineering sector, in addition to many more jobs requiring engineering skills in other sectors. Engineering represents around **20% of total UK employment.**

What are the employment prospects for engineers?

Engineering is one of the most in demand jobs globally. A recent survey found that **92%** of engineering undergraduates were working or pursuing further study 6 months after graduating.

The number of apprenticeship starts has risen to the highest it has been for 10 years. Around a quarter of a million UK workplaces now offer apprenticeships – over a 50% increase in the last 5 years.

How much do engineers get paid?

The average starting salary for engineering and technology graduates is around **£26,000**, which is approximately **20% higher** than the average starting salary for all graduates.

With experience, average salaries can be between **£35,000 and £90,000** with specialist roles and Chartered Engineers at the higher end of the scale. Many engineering employers also pay apprentices well above the statutory rate.

Where do engineers work?

The engineers of today are found in modern design offices, high tech research and development laboratories and out in the field (for example a stadium, a hospital, an airport, underground or at sea).

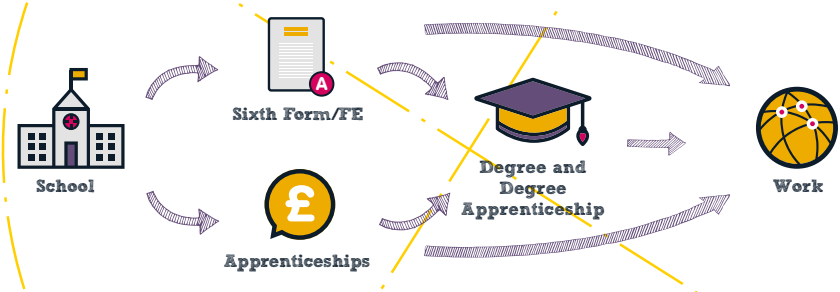
What else can you do with engineering qualifications?

The skills that engineers develop are highly transferable. Numeracy, project management, teamwork, communication, IT, problem solving and the ability to be creative and analytical are very highly valued by employers from all sectors.

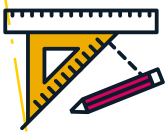
Engineering graduates can also be found working in finance, IT, teaching, project management and senior management roles in a wide variety of public and private organisations.

Data is taken from *EngineeringUK 2018: The State of Engineering.*

Getting into engineering



Important subjects and routes into engineering



Maths and science subjects, particularly **physics**, are important for engineering careers. Subjects such as **chemistry** (for biomedical or chemical engineering), **design & technology**, **computing**, **electronics** and **construction & the built environment** are also useful.

It is sometimes possible for students without maths or science subjects to complete a foundation year at university, leading directly onto an engineering degree.

Many colleges and employers seeking apprentices also welcome applications from students who have taken other subjects. Grades 9-4 (A* to C) are usually required in maths, science and English.

Entry requirements vary so please check the following:

- **Post-16 options: www.ucasprogress.com**
- **University: www.ucas.com**

Apprenticeships:

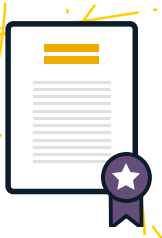
- **England: www.getingofar.gov.uk**
- **Northern Ireland: www.nidirect.gov.uk/apprenticeships**
- **Scotland: www.apprenticeships.scot**
- **Wales: https://ams.careerswales.com**

Are there any scholarships or awards to help with funding?

Several organisations offer scholarships/ bursaries for young people wanting to pursue an engineering career. There are also awards and grants for those already working in engineering and science.

More information can be found at www.tomorrowsengineers.org.uk/funding

What is a professionally registered engineer?



By joining one of the **30+ professional engineering institutions**, engineers have the opportunity to gain **professional registration** as:

- Engineering Technician/ICT Technician (EngTech/ICT*Tech*)
- Incorporated Engineer (IEng)
- Chartered Engineer (CEng)

Like doctors and lawyers, professional engineers are well respected and professional registration is recognised around the world. The letters after the name demonstrate academic ability, expertise and competence developed by work place experience.

Find out more at www.engc.org.uk/professional-registration

Next steps

The following booklets will help you and your child understand more about the different types of engineering and the various routes into the sector.

They can be downloaded or ordered in print, free of charge: www.tomorrowsengineers.org.uk

How to spot a future engineer

Asking how things work, dismantling and re-assembling things, coming up with solutions to problems and making adjustments and improvements are skills and traits that are used in engineering.

If you notice young people doing any of these, it could be that a future in engineering beckons!

The Royal Academy of Engineering identifies certain 'habits of mind' associated with engineers:

- Curiosity
- Open-mindedness
- Resourcefulness
- Collaboration/teamwork
- Creative problem solving
- Ethical consideration

Talking about engineering careers

The majority of young people look to their parents or carers for careers advice in the first instance. Here is a list of suggestions of how to prompt these conversations and how to encourage young people to explore their future options, starting with their interests:

- Trips to exhibitions, shows and museums, such as the Science Museum: **dayoutwiththekids.co.uk**
- Science and engineering TV shows, radio programmes, podcasts, computer games and apps. A quick internet search will point you in the right direction
- A simple careers quiz – Whose Crew Are You? – helps identify potential areas of interest. Find it on the App Store or at: **thebigbangfair.co.uk/whose-crew-are-you**
- Use the career finder on the Tomorrow's Engineers website and read the blogs and profiles of the engineers featured: **tomorrowsengineers.org.uk/students**
- Have a go at simple science and engineering activities at home together – there are lots to choose from, e.g. **stem.org.uk/resources/search**
- Find out about any after school clubs that may be on offer and explore opportunities for industry taster sessions, projects, summer holiday courses and other events
- Attend a science and engineering fair and consider encouraging your child to enter a project into a national competition with exciting prospects and opportunities for career progression: **thebigbangfair.co.uk** **thebigbangfair.co.uk/competition**

Most of these are free!

Where will the jobs be?

Engineers are at the forefront of shaping the world we live in, helping to solve our biggest challenges. From dealing with cyber security, enabling commercial space travel and minimsing the impact of natural disasters to developing sustainable energy, food, housing and products, engineers help pave the way to a better future for everyone.

Advanced Manufacturing: An area of significant potential growth for the UK economy, influenced by the growing 'computerisation' of production processes, a shift to shorter production runs and more tailored products (facilitated by new techniques such as 3D printing).

Automotive: Connected and autonomous vehicles are a key focus for the future, providing an additional 300,000 jobs by 2030, enabling vehicles to talk to each other and the wider world.

Aerospace and space: The UK is Europe's largest aerospace cluster and manufacturer and second only to the USA globally. Over the next 20 years there is likely to be significant investment into researching and developing greener, quieter, more economical aircraft.

Agricultural technologies: A fast-growing global market driven by population growth. Genetics, nutrition, informatics, satellite remote sensing and precision farming are underpinned by technological advances.

'Big Data': A massive global market for data analysis products and services is anticipated. The UK's current digital skills shortage means that opportunities exist in the next decade to gain the skills required to analyse complex data and turn it into useful information and intelligence.

Construction: Significant investment into housing and social infrastructure, along with projects such as Crossrail, Hinkley Point C and the expansion of Heathrow, will generate plenty of opportunities in this sector.

Creative digital: Contributes around £92 billion to the economy and employs around 9% of the UK's workforce. The UK is a world leader in areas requiring software and coding skills, such as post-production special effects in films, games design and digital advertising.

Life sciences: There are over 350 pharmaceutical companies based in the UK. The Life Sciences industry employs over 240,000 people in areas such as medical technology and biopharmaceuticals and has a turnover of £70 billion.

Low carbon economy: Power, waste processing, energy efficiency products and low carbon vehicles are all growing industries. The UK is a world leader in offshore wind and marine energy and renewable energy now provides around a fifth of the UK's electricity.

Nuclear energy: Nuclear power is likely to form an important part of a 'balanced mix' of generating technologies over the long term, to provide reliable, low carbon and cost competitive electricity. A new nuclear power station at Hinkley Point, Somerset, is due to start generating electricity by 2027.

Oil and gas: Provide more than two thirds of the UK's total primary energy and are expected to do so until at least 2035. Across the UK, oil and gas supports around 270,000 jobs.

Road and rail transport: With over £400 billion being invested in transport projects and programmes across the UK, the number of apprenticeships in the sector is expected to treble.

Data is taken from *EngineeringUK 2018: The State of Engineering.*

Tomorrow's Engineers

"There's a big shortage of engineers in the UK and in other parts of the world so you're well placed to get a job. It's really interesting work and it's well paid. You're bound to find something that interests you because there are so many jobs you can go into. I love being set a problem to solve, discussing it with other people, coming up with a new solution and implementing it."

Yasmin Ali, Operations Engineer

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