

Parents' and carers' guide to engineering careers





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, processes and technology of the future.

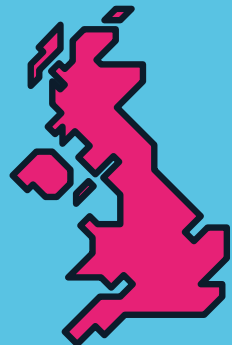
Engineers are currently addressing some of the world's most pressing problems. From tackling climate change (developing more renewable power and finding sustainable ways to grow food, build houses and travel), to dealing with cyber security and maintaining clean water supplies for everyone.

Why choose engineering?

- Engineers are in high demand - now and in the future. Engineering skills will always be needed.
- Like doctors and lawyers, professionally registered engineers are well respected and well paid.
- Engineers get to be creative, practical and innovative.
- Engineers make a real difference to the world.
- Engineers will be critical to moving the UK to Net Zero carbon emissions by 2050.
- 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.



How much do engineers get paid?

Engineers have strong earning potential. Average salaries for professional engineers tend to compare favourably against average salaries for other professionals. For specialist roles and experienced Chartered Engineers, average salaries can exceed £75,000.

Engineering apprentices expect to earn considerably more than the national apprentice minimum wage. People who graduate with engineering and technology degrees can expect to earn significantly more over their lifetime than graduates from most other subjects.*

For more information about engineering salaries, visit:
www.checksalary.co.uk/salaries/engineering

*Graduate outcomes (LEO 2021): www.gov.uk/government/collections/statistics-higher-education-graduate-employment-and-earnings

Where do engineers work?

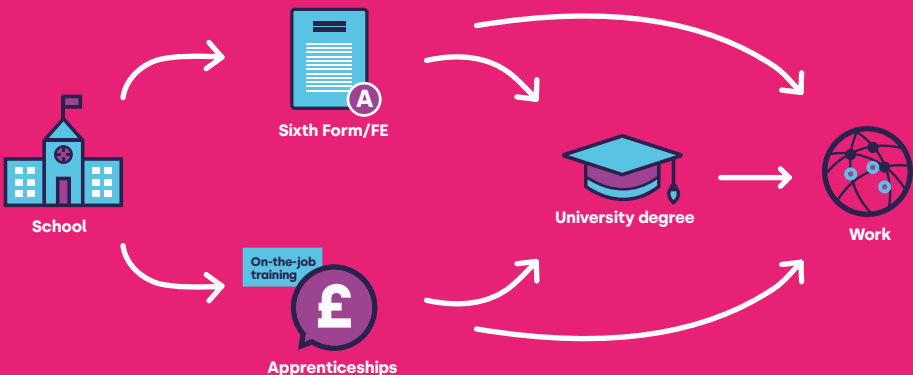
The engineers of today are found in **modern design offices, high tech research and development laboratories** and **out in the field** (for example stadiums, hospitals, airports, underground or at sea).

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 highly valued by employers from all sectors.

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

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** 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.

Apprenticeships in engineering and technology exist at different levels, including degree level. To start an apprenticeship after leaving school, grades 9-4 (A* to C) are usually required in maths, science and English.

What are T levels?

T levels are roughly equivalent to 3 A levels and take 2 years to complete. They consist of 80% classroom learning and 20% work placement, and they can lead onto university, a degree apprenticeship or employment. Subjects include:

- Design & development for engineering and manufacturing
- Design, surveying & planning for construction
- Digital production, design & development
- Building services engineering for onsite construction
- Science

For a full list and to search for T levels, visit: www.tlevels.gov.uk/students

Explore all post-16 options:
www.ucas.com



Search for apprenticeships:

England: www.apprenticeships.gov.uk

Northern Ireland: www.nidirect.gov.uk/apprenticeships

Scotland: www.apprenticeships.scot

Wales: www.careerswales.com

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/ICTTech)
- 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



How to spot a future engineer

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

Hear from engineers and people who work in tech, describing what they do and how they got into their job:

www.thisisengineering.org.uk

www.neonfutures.org.uk/case-study

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 and carers for careers advice in the first instance. Here is a list of suggested prompts for these conversations, to help encourage young people to explore their future options, starting with their interests:

- **Trips to exhibitions, science centres and museums:**

www.dayoutwiththekids.co.uk
www.sciencecentres.org.uk/centres/

- **Science, technology and engineering TV shows, podcasts, computer games and apps.** A quick internet search will point you in the right direction

- **A fun careers quiz - Meet the future you** - helps young people match their strengths and passions to careers in engineering
www.mtfy.org.uk



- **For more suggestions, including magazines, podcasts, hands-on activities, online games, books, STEM fairs and social media accounts, have a look at the student guide on Neon:**
www.neonfutures.org.uk/student-guide

- **Visit 'Talking Futures', a toolkit designed for parents and carers to support constructive careers conversations with their children:**
www.talkingfutures.org.uk

- **Have a look at different engineers describing what they do and how they got into their job:**

www.neonfutures.org.uk/case-study
www.thisisengineering.org.uk

- **Find out about any after school clubs that may be on offer** and explore opportunities for industry taster sessions, projects, competitions, summer holiday courses and other events

Most of these are free!

Where will the jobs be?

Engineers are critical to solving our biggest challenges. From minimising the impact of natural disasters to developing renewable power and producing and distributing vaccinations, engineers and technicians create a better future for everyone.



Advanced manufacturing: A growing sector, influenced by the 'computerisation' of production processes, designing for the new 'right to repair' legislation, using renewable materials and techniques like 3D and 4D printing.



Automotive: Electric and autonomous vehicles are a key focus for the future as diesel and petrol cars are phased out, leading to thousands of additional jobs in automotive, design, electrical and mechanical engineering.



Aerospace and space: The UK is a world-leading aerospace manufacturer and is making significant investment into researching and developing greener, quieter, more economical aircraft.



Agricultural technologies: A fast-growing global market driven by population growth and the need to reduced associated greenhouse gases. Nutrition, informatics, satellite remote sensing, precision farming, vertical farming and meat alternatives are all underpinned by technological advances.



'Big Data': There is a massive global market for data analysis products and services. 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 intelligence.



Creative digital: The UK is a world leader in areas requiring software and coding skills, such as post-production special effects in films, games design, app development and digital advertising.



Construction: Significant investment into low-carbon construction techniques, developing new housing and the need to retrofit our existing housing stock, along with infrastructure projects such as HS2, Northern Powerhouse Rail and the Dogger Bank wind farm, will generate plenty of opportunities in this sector.



Life sciences: Employs people in areas such as medical technology and biopharmaceuticals. There has been a rapid expansion in the number of roles for engineers working on vaccine research, development, manufacture and distribution.



Renewable energy: Renewables now provide around a third of the UK's electricity. The UK is a world leader in offshore wind. Other growth sectors include solar and hydrogen energy, requiring engineers who are skilled in civil, electrical, chemical and mechanical engineering.



Nuclear power: Will form an important part of a 'balanced mix' of generating technologies over the long term, to provide reliable, low carbon electricity.



Materials and recycling: With the urgent need to reduce landfill and clean up the ocean, engineers and technicians are developing recyclable and biodegradable products and clothing, as well as designing apps that promote behaviour change around re-using and upcycling. They are also using AI to improve automated waste sorting.



Road and rail transport: including smart motorways and port expansion, as well as the electrification of the rail network mean engineers and technicians working in this sector will be in demand.



Allannah, software engineer

I chose to do an apprenticeship where I can learn on the job, and earn while working alongside professionals - I've come out with so much experience

<https://neonfutures.org.uk/allannah>



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