

Diversity



6.4

million people work in engineering and technology jobs in the UK



Only **16.9%** of the engineering and technology workforce are **women**, compared with 56% in other occupations



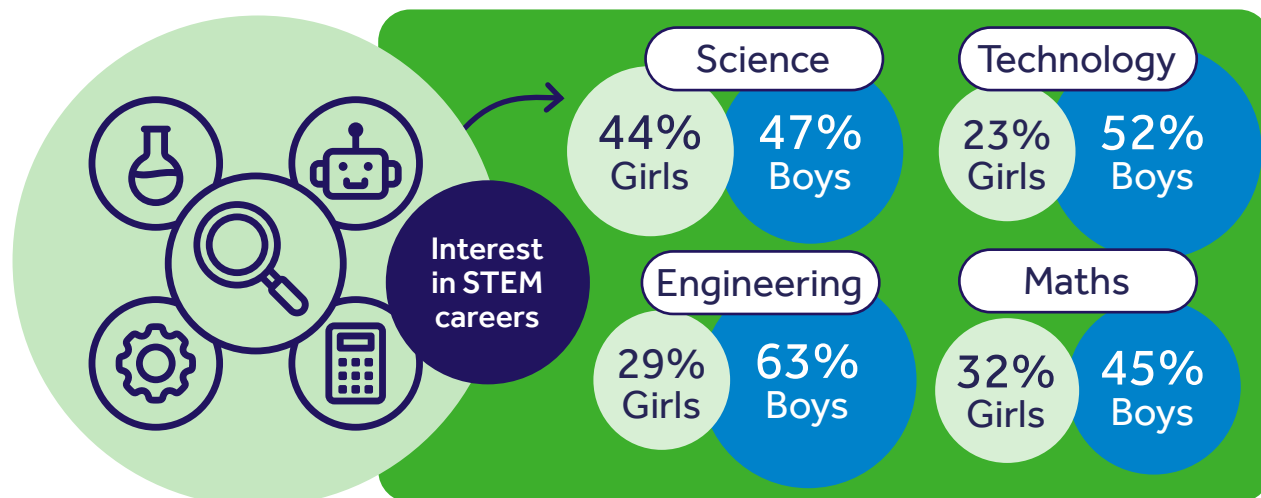
14% of the engineering and technology workforce are from a **UK minority ethnic background**, compared with 18% in other occupations



14% of the workforce in engineering and technology are disabled **vs. 19% in other occupations**



14% of engineering and tech apprenticeship starts are from UK minority ethnic students **vs. 16% across all subjects**



www.eukeducation.org.uk/references

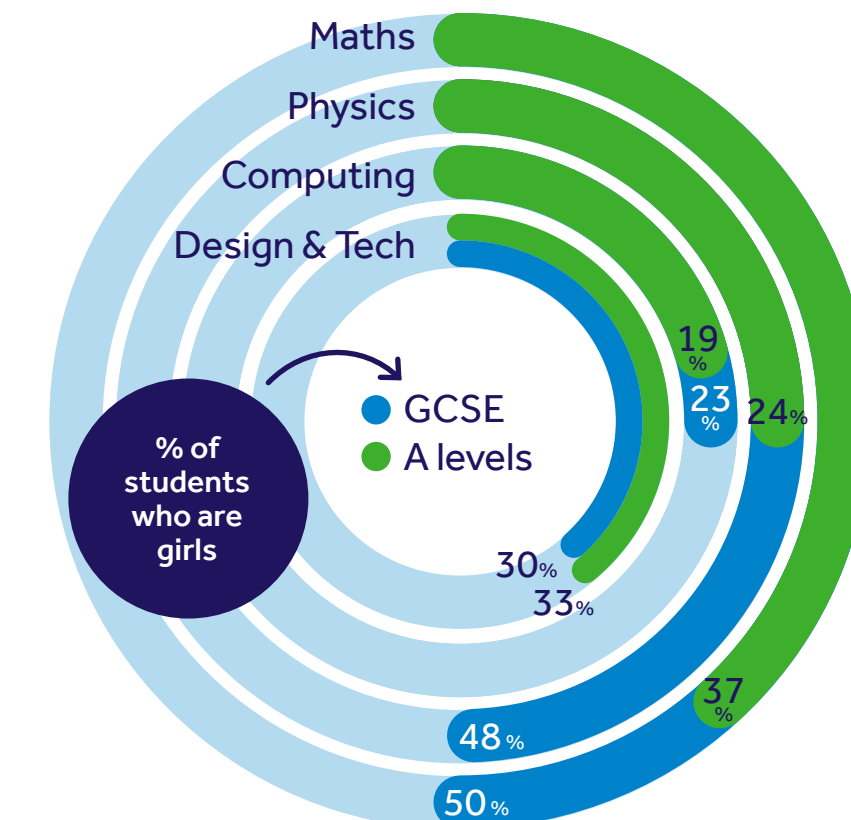
36% of **girls** say science is **not for them** compared with 30% of boys

16% of **girls** think engineering is **suitable for them** compared with 44% boys



12% of **girls** say **being an engineer fits well with who they are** compared with 38% of boys

Interest in schools science for girls has declined since 2019
↓ 75% to 65% while boys have remained consistent



in engineering and technology are **young women**

The engineering and technology workforce is not representative of the wider working population. We need to attract more young people from all backgrounds, especially girls, to create the diverse workforce needed for engineering and technology to thrive.

School students



% of students, that say **science is not for them**

35% white

26% Black

22% Asian

30% mixed ethnicity

SEND* students

are equally interested in science at school compared to non-SEND students, **but less interested in a science career (39% vs. 48%)**

are equally interested in an engineering career (47%) and **are more interested in a tech career (43% vs. 37%)**

Students eligible for free school meals (FSM) **less likely to think they are good at science (44% vs. 51% non-FSM)**

SEND students are less likely to think they are good at science (40% vs. 51% non-SEND)

*Special educational needs and disabilities

Educational pathways into engineering and technology

Young people interested in an engineering career prefer a technical or vocational route (36%) compared to a university route (28%)



More interested in a university route
Girls 38% Asian students 44%



More interested in a technical or vocational route
Boys 40% white students 40%

Teachers



Teachers are equally likely to recommend an apprenticeship or university route (36%) and less likely to recommend another technical/vocational route (4%)

53% feel confident advising their students of vocational and technical pathways into engineering

85% of STEM teachers recommend a career in engineering

83% of teachers say they know what subjects their students would need to take to have a career in engineering

Top 3 reasons young people are interested in a technical or vocational route



To start earning money straight away

48%

Prefer to learn by doing things

48%

Engineering is practical and well suited to on-the-job learning

46%

Top 3 reasons young people are interested in a university route



To keep career options more open

54%

A degree would lead to better paid jobs in the long run

53%

To have the experience of going to university

54%

Top 3 reasons STEM teachers would recommend a technical or vocational route into engineering



If they prefer to learn by doing rather than being in a classroom

54%

Engineering is practical and well suited to on-the-job learning

52%

To avoid high student fees and/or debt

50%

Top 3 reasons STEM teachers would recommend a university route into engineering



To keep career options more open

71%

They might need a degree to progress in their career

48%

Better for their personal development

39%

We need all young people to understand the variety of educational routes available to them to have a career in engineering and technology. As parents and teachers are the main sources of careers information for young people, it is important to also understand their level of knowledge.

89%
of STEM teachers in England are aware of T Levels



But only 11% say their school or college offers T Levels

Parent knowledge of different education/training routes:



	Know a lot	Know a little
University	42%	40%
Apprenticeships	20%	60%
Other vocational	15%	54%
BTECs	12%	47%
T Levels	5%	23%

Engineering and technology workforce

6.4

work in engineering and technology jobs in the UK, that's 19% of all jobs



25% of all job adverts are for engineering and technology roles

1 in 5 jobs in the UK are in engineering yet engineering vacancies account for only 1 in 4 adverts

48% increase in job adverts mentioning 'green skills'
55% increase in job adverts for 'green engineering jobs'

Up to 725K new jobs are needed to support the transition to net zero



Engineering and technology jobs predicted to grow in all UK regions between now and 2030 faster than other occupations

16.9%



of the workforce in engineering and technology are women vs. 56% in other occupations

14%



of the workforce in engineering and technology are disabled vs 19% in other occupations

14%

are from a minority ethnic background



18%

in other occupations

Occupation and industry

13% working as an engineer in the engineering and technology industry

6% working as an engineer in a different sector

10% working in the engineering and technology industry but not as an engineer

71% neither working as an engineer nor in the engineering and technology industry

Engineering and technology occupations
All other occupations combined

Ethnicity		
Asian	8%	9%
Black	3%	5%
Mixed ethnic groups	1%	2%
Other ethnic groups	2%	2%
White	86%	83%

Geographical specialisms



Environment, energy and earth occupations



Skilled trades, industrial and general operative roles

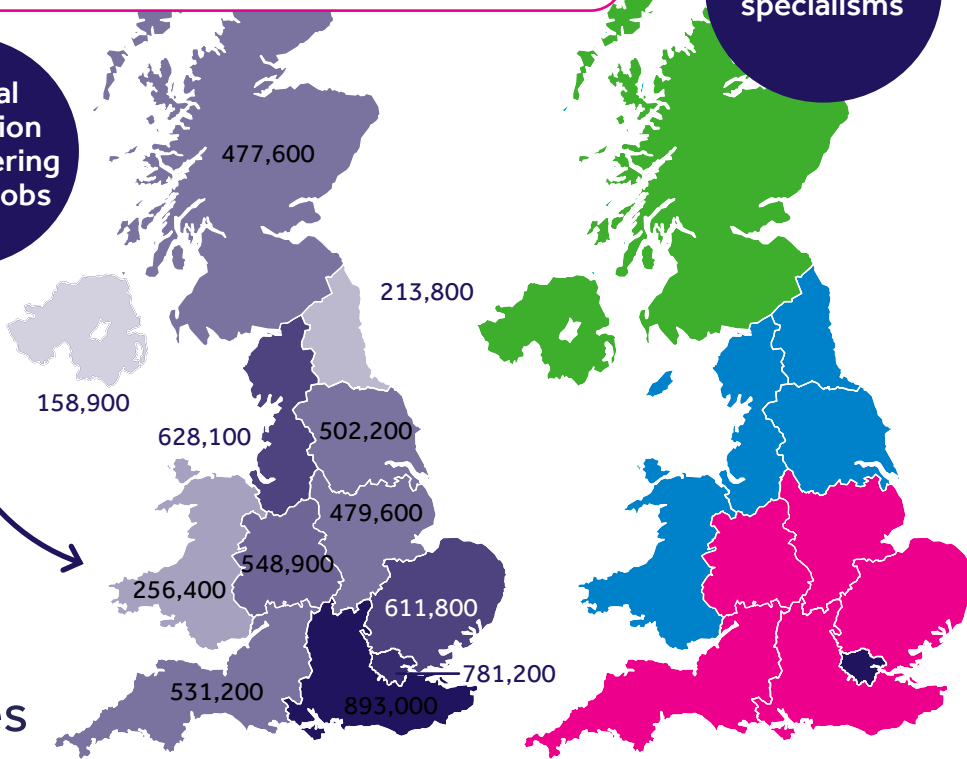


Mechanical and electrical



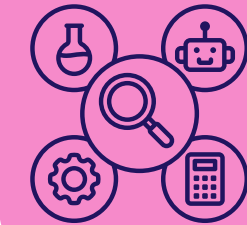
ICT and civil engineering roles

Regional distribution of engineering and tech jobs



Over 6m engineering and technology professionals are employed in the UK. Jobs are predicted to grow but the industry faces skills shortages and lacks diversity, with women the most underrepresented group.

Interest in STEM careers



Science

44% Girls
47% Boys

Technology

23% Girls
52% Boys

Engineering

29% Girls
63% Boys

Maths

32% Girls
45% Boys

83% of students were more interested engineering jobs because of The Big Bang Fair

31% of students were more interested in science, engineering and tech because of The Big Bang Fair

85%

of STEM teachers recommend a career in engineering



19%

were more interested in engineering careers because of Energy Quest

What students and teachers say

Key subject uptake

Double science
16.1%



Entries into key GCSE subjects and proportion of all entries:

Double science* – 989,264	16.1 %
Maths – 893,198	14.5 %
Chemistry – 174,088	2.8 %
Physics – 173,227	2.8 %
Computing – 91,619	1.5 %
Design & technology – 86,307	1.4 %
Engineering – 2,476	0.04 %

*Double science counts for 2 entries per student

Maths – 34,775	10.4 %
Chemistry – 15,210	4.6 %
Physics – 13,680	4.1 %
Practical woodworking – 9,040	2.7 %
Computing science – 6,585	2 %
Design and manufacture – 3,990	1.2 %

Entries into key Scottish National 5 subjects and proportion of all entries:

Entries into key Scottish Higher subjects and proportion of all entries:

T Level uptake

All engineering and tech-related: 5,643 (47%)



Top 3 subjects

Digital production, design and development	1,472
Design and development for engineering and manufacturing	1,110
Design, surveying and planning for construction	1,022

www.eukeducation.org.uk/references

Entries into key A level subjects and proportion of all entries:

Maths
12.7%



Maths – 112,138	12.7 %
Chemistry – 63,538	7.2 %
Physics – 44,957	5.1 %
Computing – 19,796	2.2 %
Design & technology – 10,576	1.5 %

Maths – 19,705	9.7 %
Chemistry – 10,120	5.0 %
Physics – 8,560	4.2 %
Computing science – 3,960	2 %
Design and manufacture – 1,940	1 %

Higher education – first year undergraduates:



38,615
engineering and technology students, around 6% of all subjects

8,680 mechanical engineering
6,115 electronic and electrical engineering
6,080 general engineering
5,285 civil engineering
3,845 aerospace engineering
2,750 chemical, process and energy engineering
2,430 production and manufacturing engineering
3,430 other engineering and technology subjects

There are many different routes into engineering and technology roles, but there are some key STEM subjects that set young people up well for following this career path. Girls are underrepresented in all key subjects and pathways into engineering and tech.

Apprenticeship uptake

Engineering and technology-rated apprenticeship starts

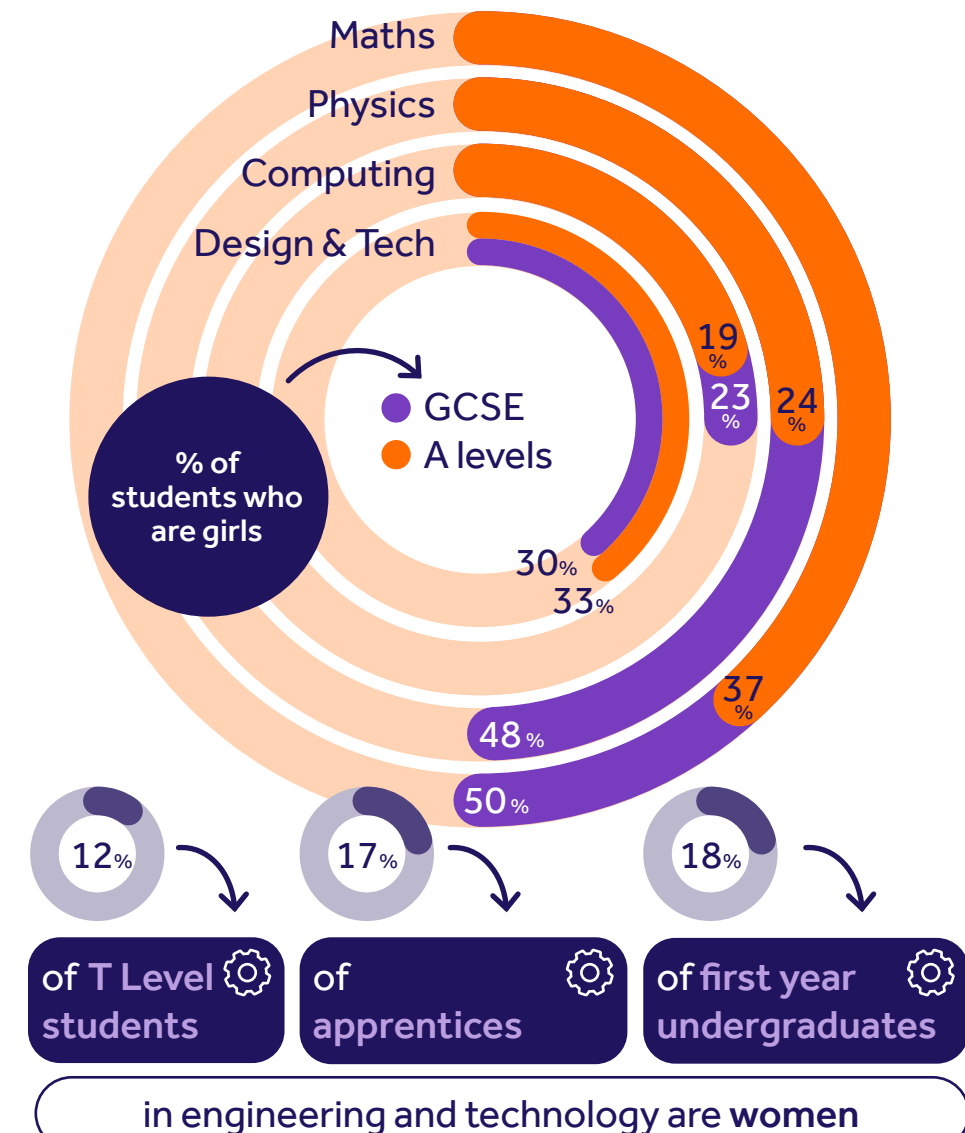
97,120
England

5,025
Wales

12,026
Scotland

4,316
Northern Ireland*

*STEM apprenticeship starts



83%

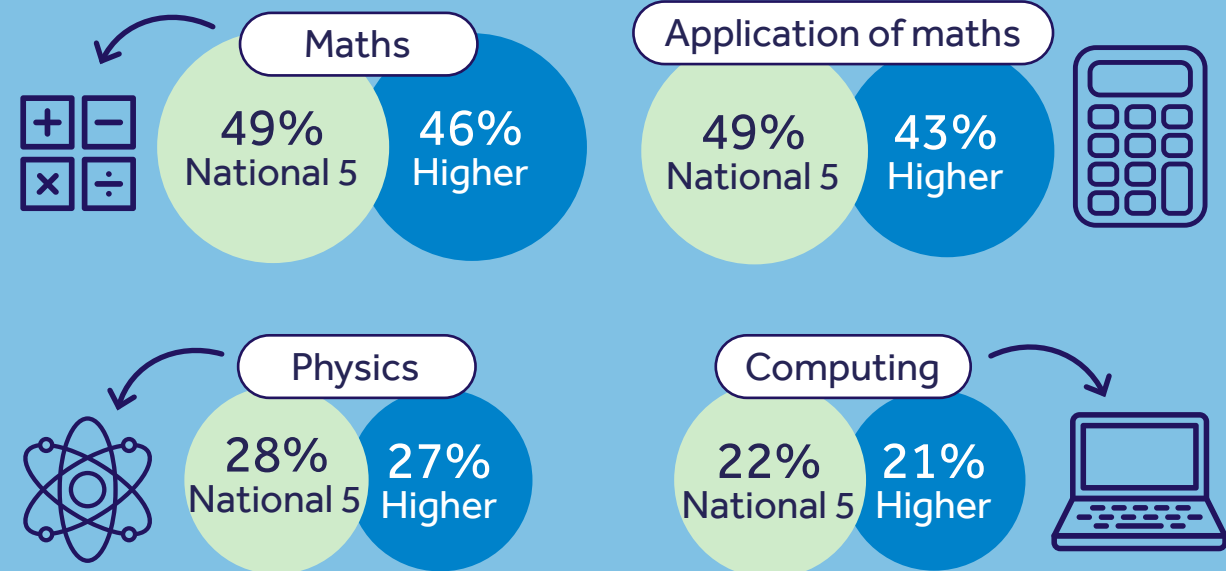
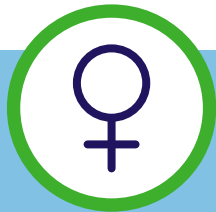
of teachers say they know what subjects their students would need to take to have a career in engineering

48%

of parents say they understand the subject requirements to follow an engineering career path

Key subject uptake - Scotland

Proportion of students taking National 5 and Higher subjects who are girls



Engineering and tech-related apprenticeship starts



560
Foundation
apprenticeships

12,026
Modern
apprenticeships

677
Graduate
apprenticeships

Entries into key National 5 subjects and proportion of all entries:

Subject	Count	Proportion
Maths	34,775	10.4 %
Application of maths	27,655	8.3 %
Chemistry	15,210	4.6 %
Physics	13,680	4.1 %
Practical woodworking	9,040	2.7 %
Computing science	6,585	2 %
Design and manufacture	3,990	1.2 %
Engineering science	2,135	0.6 %

Entries into key Scottish Higher subjects and proportion of all entries:

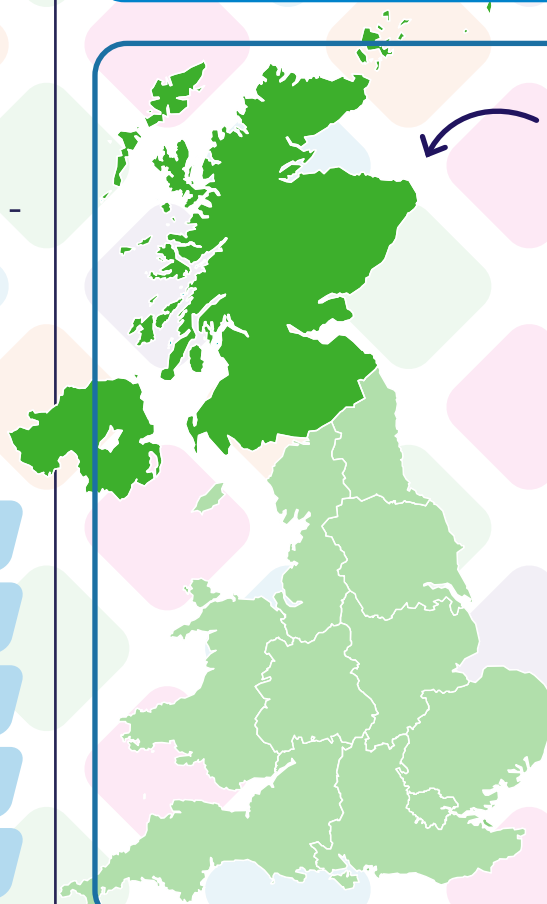
Maths 9.7%

Subject	Count	Proportion
Maths	19,705	9.7 %
Chemistry	10,120	5 %
Physics	8,560	4.2 %
Application of maths	4,680	2.3 %
Computing science	3,960	2 %
Design and manufacture	1,940	1 %
Engineering science	1,400	0.7 %

Scotland is a vital part of the UK's engineering and technology landscape. It has a different education system from the rest of the UK, with different key STEM routes into these careers.

Scotland makes up 8% of the UK's engineering and technology workforce

8%



North Eastern Scotland in particular has a very high proportion of engineers relative to its population

Jobs in environment, energy and earth are particularly prevalent in Scotland

Knowledge and perceptions

Young people

72% think engineering is a career that allows people to be creative



36% say they know a fair amount about what engineers do



32% say they know a fair amount about what those working in tech do



35% of young people are interested in a career that will help reduce the impact of climate change



64% of young people are interested in climate change issues



21% of students said Energy Quest motivated them to find out more about engineering jobs



79% of The Big Bang Fair attendees said they knew more about what engineers do after The Fair. **75%** wanted to find out more about STEM jobs. **65%** were inspired to consider a job in STEM.

www.eukeducation.org.uk/references

46% interested in an engineering career



38% interested in a tech career



25% think engineering fits well with who they are



12% of girls say being an engineer fits well with who they are compared with 38% of boys



Interest in STEM careers

30% think engineering is suitable for them



16% of girls think engineering is suitable for them compared with 44% boys



Science

44% Girls
47% Boys

Technology

23% Girls
52% Boys

Engineering

29% Girls
63% Boys

Maths

32% Girls
45% Boys

36% of girls say science is not for them



Engineering and technology jobs offer a wide range of opportunities to young people. More can be done to improve knowledge and perceptions of these careers amongst both teachers and students.

Young people interested in an engineering career prefer a technical or vocational route (36%) compared to a university route (28%)



More interested in a university route
38% Girls
44% Asian students



More interested in a technical or vocational route
40% Boys
40% white students

Teachers are equally likely to recommend an apprenticeship or university route (36%), another technical/vocational route (4%)

53% feel confident advising their students of vocational and technical pathways into engineering

85% of STEM teachers recommend a career in engineering

92% said engineering is important or very important in the UK achieving net zero by 2050

Teachers



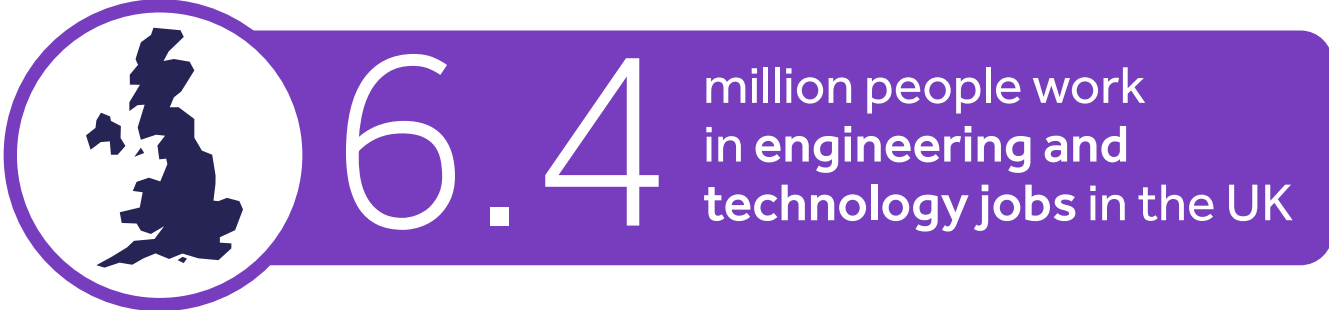
76% of teachers delivering Big Bang at School said it made them more confident to speak to students about STEM careers



82% said it motivated them to suggest STEM careers to students



Transition to net zero



25% of all job adverts are for engineering and technology roles

In the past 5 years:

48% ↗

increase in job adverts mentioning 'green skills'

55% ↗

increase in job adverts for 'green engineering jobs'



Up to **725K** new jobs are needed to support the transition to net zero

77%



of **students** agreed that The Big Bang Fair had shown them solutions to environmental problems.

71%



of **students** said that Energy Quest had taught them about the role engineers play in developing technologies for renewable energy sources



92%

of teachers said engineering would be important or very important in the UK achieving net zero by 2050

www.eukeducation.org.uk/references

Projected new jobs in net zero workforce

Transportation



Aviation	10,350
Electric vehicles and batteries	90,000
Rail	12,000
Energy and power	
Energy (all)	260,000
Biomass and bioenergy	15,000
EV charging points	4,900
Hydrogen	28,000
Solar PV	26,250
Wind (offshore)	104,400
Wind (onshore)	27,000

Buildings



Retrofit	250,000
Industry	
Industrial decarbonisation	353,000
CCUS (Carbon Capture, Usage and Storage)	70,000

Waste



Waste & recycling	14,800
-------------------	--------

Engineering and technology is fundamental in providing solutions to climate change and achieving net zero. Demand for 'green skills' is increasing, with up to 725,000 new jobs needed to support the UK's transition to net zero across a wide range of sectors.

Young people's interest in the environment



Girls

Climate change **47%**
Biodiversity loss **37%**
Sustainable fashion **21%**



Boys

Climate change **38%**
Biodiversity loss **24%**
Transport that has less impact on the environment **21%**

35%

of young people are interested in a career that will help reduce the impact of climate change

64%

of young people are interested in climate change issues

What are the top 3 environmental topics young people are interested in?

31%
biodiversity loss

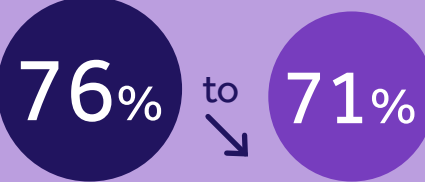
42%
climate change

22%
air pollution

*New jobs projections are indicative numbers from over 20 pieces of original research and analysis. As such, projection methodology and dates will differ.

STEM in school

Interest in school science among years 7 to 9 has declined from



For girls, the decline is 75% to 65%

Year 7 to 9 students are less confident in their abilities compared to 2019

49% think they are good at science, down from 56%

43% think they are good at computing, down from 50%

8 in 10 STEM teachers have delivered STEM outreach in the last year

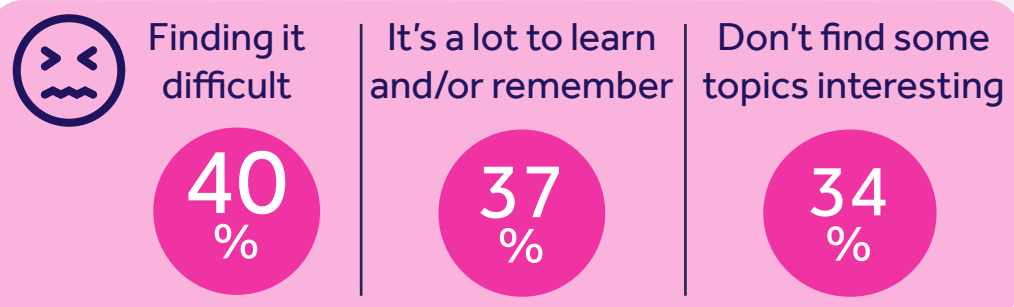
Barriers to delivering more STEM outreach:



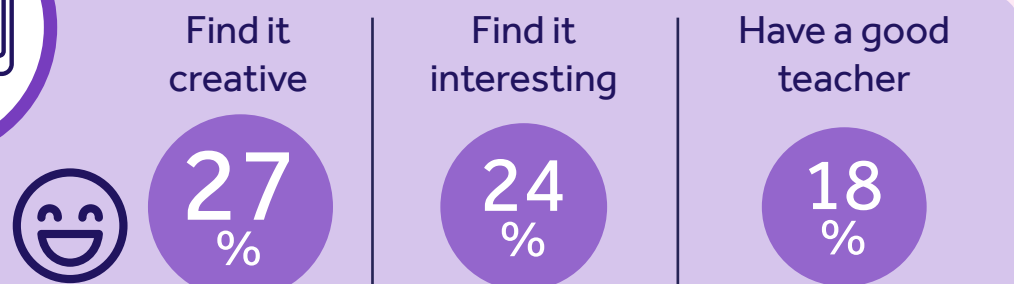
www.eukeducation.org.uk/references



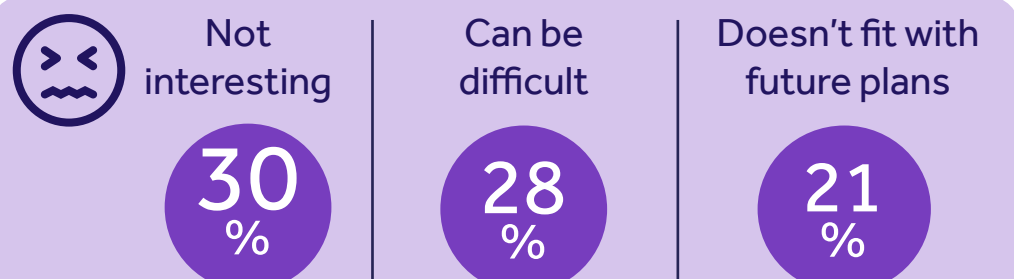
Main motivations and discouragements for years 7 to 9 studying science:



Main motivations and discouragements for years 7 to 9 studying computing:



But 43% of girls say nothing has encouraged them, compared to 27% of boys



33% of boys say nothing has put them off, compared to 15% of girls

Interest and confidence in school science is declining. Hands-on practicals are declining, despite being the main motivator for young people.

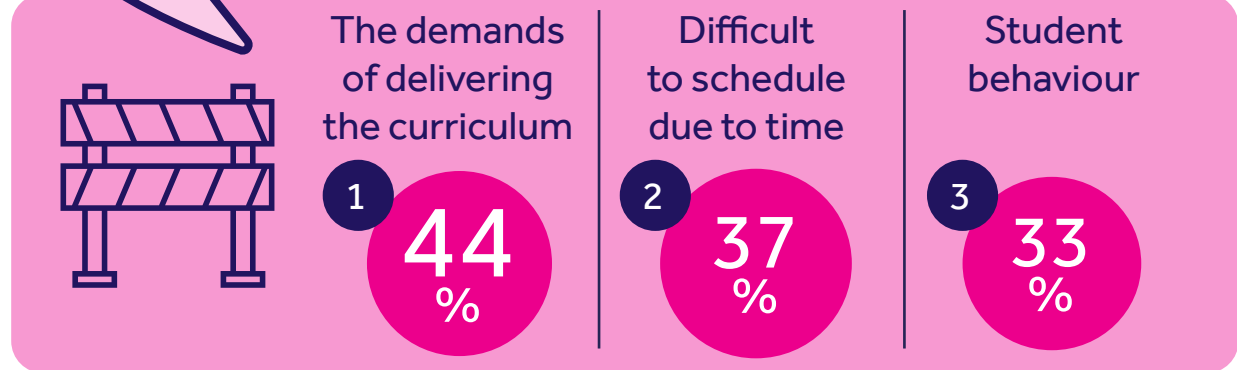
GCSE students doing hands-on practical work at least once a fortnight is declining



Top 3 barriers for teachers delivering practicals:

Watching a video of a practical fortnightly has risen from 26% to

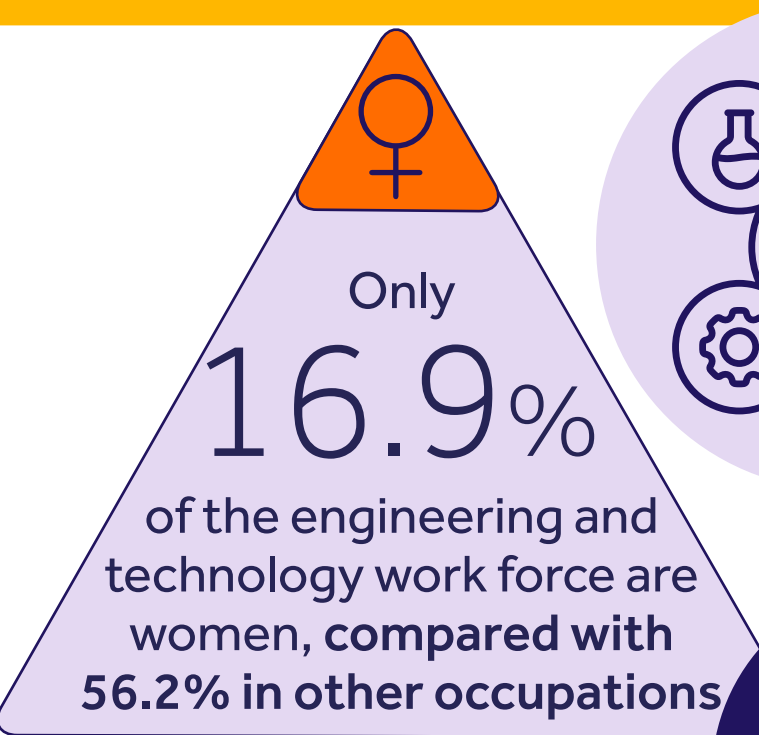
46% since 2016



43% of young people report doing a STEM extracurricular activity in the last year

Careers fair	17%
Talk at school	15%
School club	12%

Women in engineering



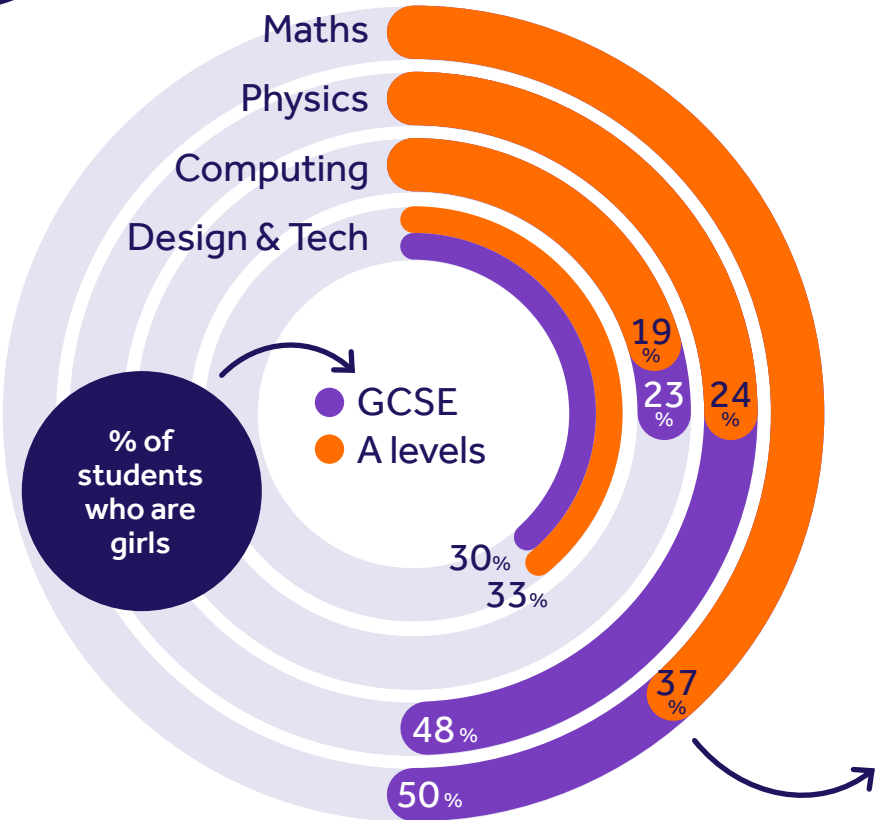
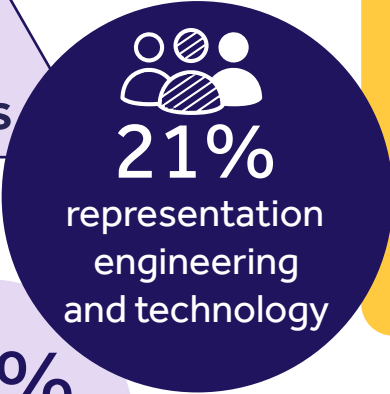
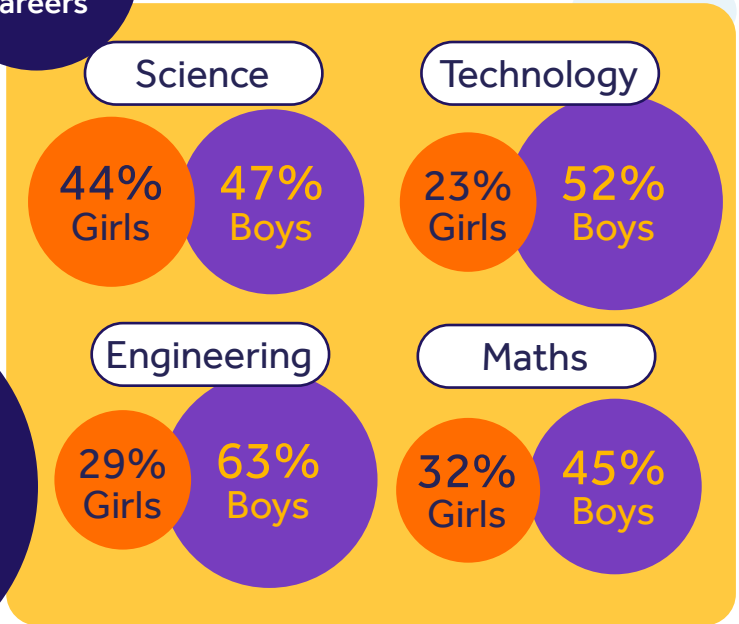
A higher proportion of women working in engineering and technology are from **ethnic minority background** compared to other occupations:

Ethnicity	Engineering and technology occupations		All other occupations combined
Asian	8%	9%	
Black	3%	5%	
Mixed ethnic groups	1%	2%	
Other ethnic groups	2%	2%	
White	86%	83%	

www.eukeducation.org.uk/references



Top 3 environmental topics young people are interested in
42% climate change
31% biodiversity loss
22% air pollution



12% of girls say **being an engineer fits well with who they are** compared with 38% of boys

Interest in schools science for girls has declined since 2019 **75% to 65%** while boys have remained consistent

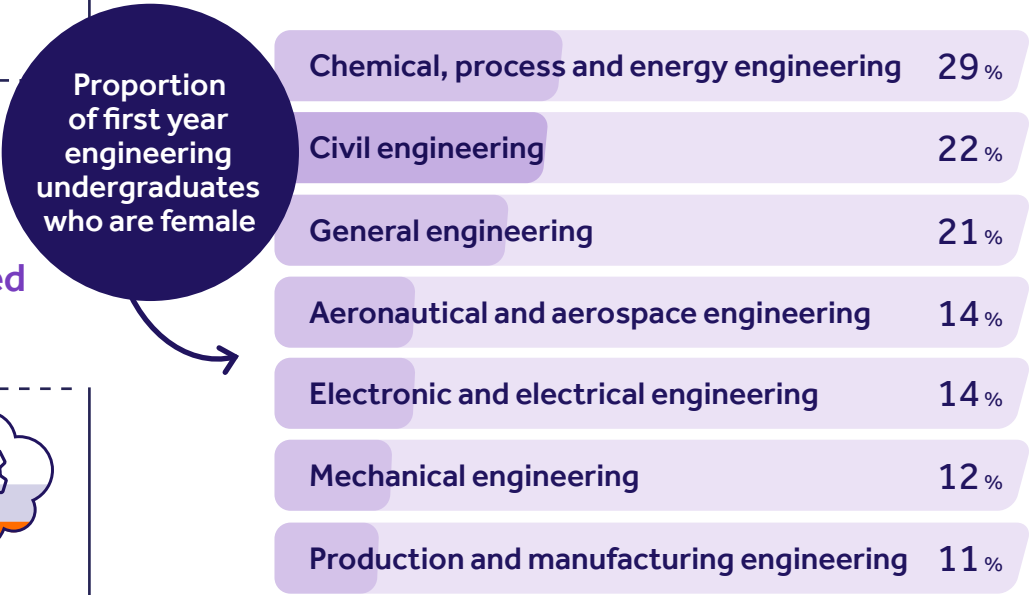
36% of girls say science is **not for them** compared with 30% of boys

16% of girls think engineering is **suitable for them** compared with 44% boys

Girls make up half of those taking maths and physics GCSE, **but this drops at A level:** 37% maths and 24% physics

At just under 17% of the workforce, women are the most underrepresented group in engineering and technology. Girls drop out of engineering and tech pathways throughout education and are much less interested in these careers than boys.

18% of students starting **undergraduate engineering degrees** were women, compared to 56% across all subjects



12% of **engineering T Levels** entries were girls, compared to 46% across all subjects

17% of **engineering apprenticeship** starts were by women, compared to 52% across all subjects