Canal & River Trust

STEM

London STEM Programme

Our Waterways and STEM

Impact Report 24/25

Foreword

Young people are vital to the future of our canals and rivers. Not only as future visitors and supporters, but also as a future workforce. We need to foster a deeper understanding and appreciation of the role our canals and rivers play in environmental sustainability, engineering innovation and historical significance, and of the work we do in looking after the environment and the waterways.

So much of our work requires skills linked to science, technology, engineering and maths (STEM), which makes us uniquely positioned to support STEM education and related careers exploration.

There are so many examples of STEM along our waterways, from our historical engineering work and water management, to understanding biological habitats and helping to tackle the effects of climate change. Our London STEM programme leverages the unique environment of our waterways to provide a free programme of hands-on, inspiring experiences to demonstrate real-world STEM skills.

With a focus on underserved areas, we can ensure equitable access to STEM learning opportunities, helping to address social inequalities. By raising awareness as a STEM employer, we promote diversity and inclusion in the workforce, making Canal & River Trust a valuable partner for STEM education.

Ros Daniels, Regional Director (London & South East), Canal & River Trust

Much of our work is rooted in STEM

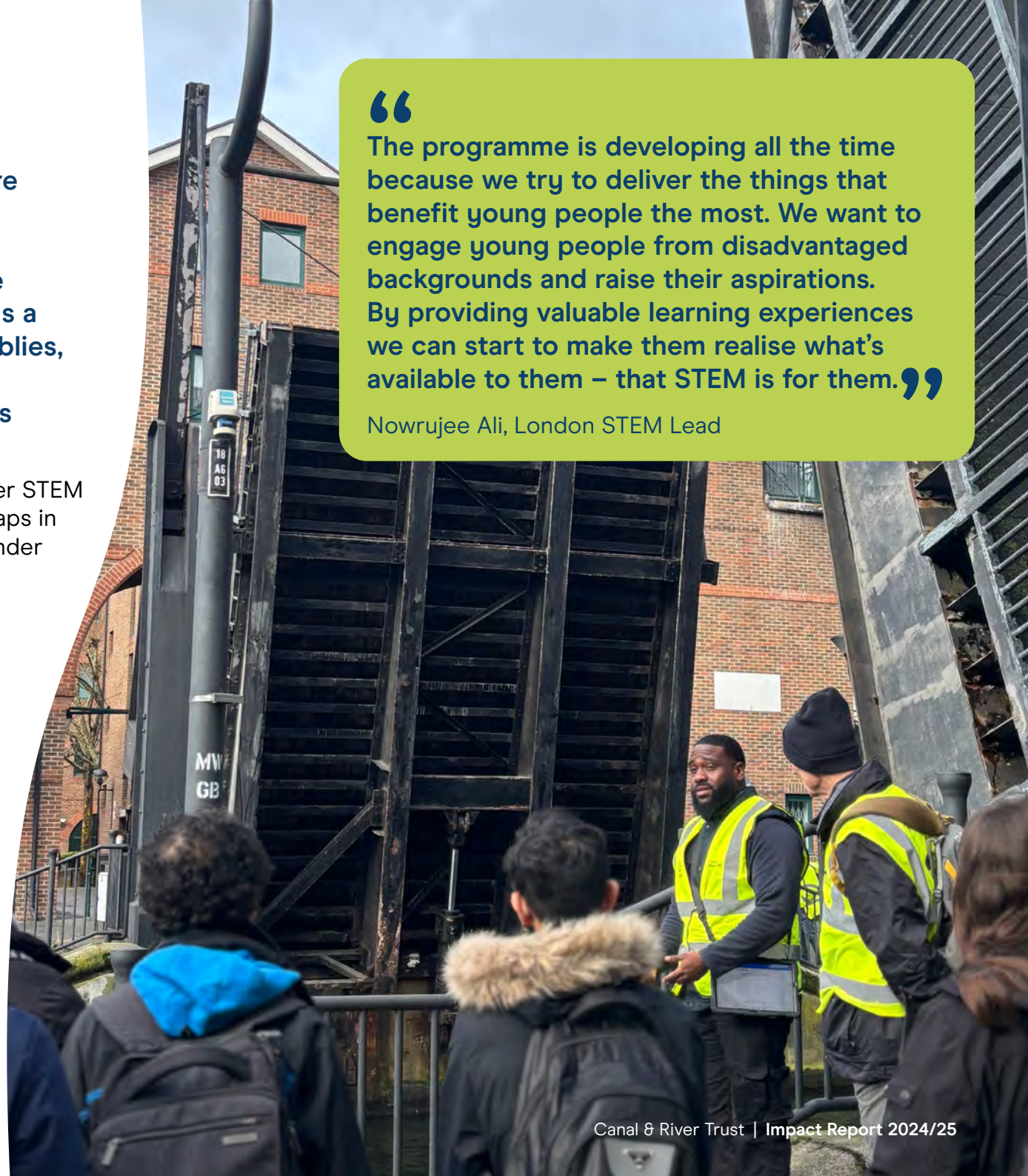
Introduction

The London STEM programme aims to inspire and empower young people, particularly those from underrepresented communities, to engage with STEM fields. The programme uses London's canals, rivers and reservoirs as a unique platform to deliver free visits, assemblies, webinars, and careers education to schools. All these interventions aim to link STEM skills to real-world application.

The London initiative forms part of the Trust's broader STEM programme, which has the goal of bridging critical gaps in the UK's STEM sector, addressing skill shortages, gender imbalance and socio-economic underrepresentation.

Over three years the London STEM programme has developed from a programme of individual careers sessions and workshops, to building deeper relationships with schools to deliver bespoke, integrated programmes which meet a range of curriculum and pastoral needs, and foster inclusivity.

This impact report draws together findings from surveys conducted amongst representative samples of participating students and teachers, including a student survey conducted at the beginning of the London STEM project. In-depth interviews were also conducted with teachers and members of Trust staff involved with the project, to reflect in detail on the impact of the programme.



> **"The programme is developing all the time because we try to deliver the things that benefit young people the most. We want to engage young people from disadvantaged backgrounds and raise their aspirations. By providing valuable learning experiences we can start to make them realise what's available to them – that STEM is for them."**
>
> Nowrujee Ali, London STEM Lead

The London STEM programme at a glance

Reaching young people through schools and colleges

To attract more young people into STEM-related careers, it is essential that they understand real-world application of their studies at school. The London STEM programme brings STEM learning to life through hands-on, interactive experiences.

We have worked with teachers to make sure we reach as many young people as possible. All activities are embedded in the national curriculum and support schools in achieving the Gatsby Benchmarks, which are designed to improve careers education. The entire programme is flexible to meet teacher needs.

- **All learning and teaching styles**
- **All abilities and ages**
- **Cross-curricular links**

Teachers also report wide-reaching benefits to pupil wellbeing, plus growing levels of confidence, aspiration, self-esteem and life skills, as a result of engaging with the programme. These factors are particularly noted amongst underrepresented communities.

80	56	12,695
London schools within 1km of a canal	Schools and colleges participated	Pupils participated

Our core programme

	**Waterside visits**	Available at four London sites that have links to ecology, heritage and engineering. Schools explore either; how canals can help fight against climate change; or how engineers help to manage waterways.
	**In-school workshops**	Hands-on practical sessions exploring canal heritage and engineering skills related to bridge building.
	**Careers webinar**	Canal & River Trust employees share their experience of working in STEM related jobs, including Ecologist, Environmentalist, Hydrologist, Engineer and Project Manager.
	**Assemblies & career fairs**	Face-to-face sessions with Q&A to introduce young people to STEM careers at the Trust and the people who do them.

> **“The children were buzzing when they came back. They were really excited. They were telling their parents about it, telling people about it the next day. And we’ve got some students that have told us they go outside more now, they just enjoy being outside.”**
>
> Rachael Harvey, Geography and Safeguarding Leader, Wapping High School

Case studies

Schools engage with the London STEM programme in many different ways. Three of the schools participating in 2024/25 told us about their experiences and the benefits to students.

Preston Manor School, Wembley

- Assemblies for Years 7 and 8
- Bridge building workshop: KS3
- Brent Reservoir visit to support Science and Geography
- Black History Month STEAM workshop

> **“Many of our students come from deprived families and have never done things like this before, so any exposure to different opportunities is invaluable. It had a very positive effect on everyone. The children were very excited and felt very lucky. Many students just don’t have the chance to experience nature.”**
>
> Dr Despo Speel, science teacher

Gladesmore Community School, Tottenham

- KS3 environment assembly
- KS4 careers assembly
- Years 7 and 8 canal field trip

> **“The trips had a real impact on the staff as well as students. We find you form a different relationship with the students because you’re not doing that ‘teachy’ thing – you’re talking to them – and then they tend to come back and speak to you differently as well because you’ve had a shared experience.**
> **If we could inspire just a few to just think about work, especially from an environmental aspect, that’s what I would like.”**
>
> Vassa Artimatas, Assistant Headteacher

Wapping High School

- STEM careers workshop
- Black History Month STEAM workshop
- Visit to impounding station and tour of Docklands to support science, history and careers
- Rivers field study at River Lea

> **“We’re very urban and we’ve got a lot of students who don’t spend much time outside. Our playground is on the roof which is not ideal when it comes to learning outside the classroom or trying to do fieldwork. I think it’s been brilliant. Canal & River Trust have always been really flexible to make things work. It’s really nice to be able to lean into someone else’s experience and excitement, it’s like you get reinvigorated.”**
>
> Rachael Harvey,
> Geography and Safeguarding

The Impact

Engaging underrepresented communities

Every school that engaged in the London programme in 2024/25 has a Free School Meal (FSM) eligibility rate higher than the national average.

The London programme engages schools from some of the most deprived communities in the country, according to the English Indices of Deprivation, in which as many as **64.7%** of children are eligible for free school meals. A significant proportion of students are from ethnically diverse communities. Numbers of students with English as an Additional Language (EAL) run as high as **83.8%**; 4.5 times the national average.

FSM Eligibility
National average: 27.3%

London STEM schools
36.8%

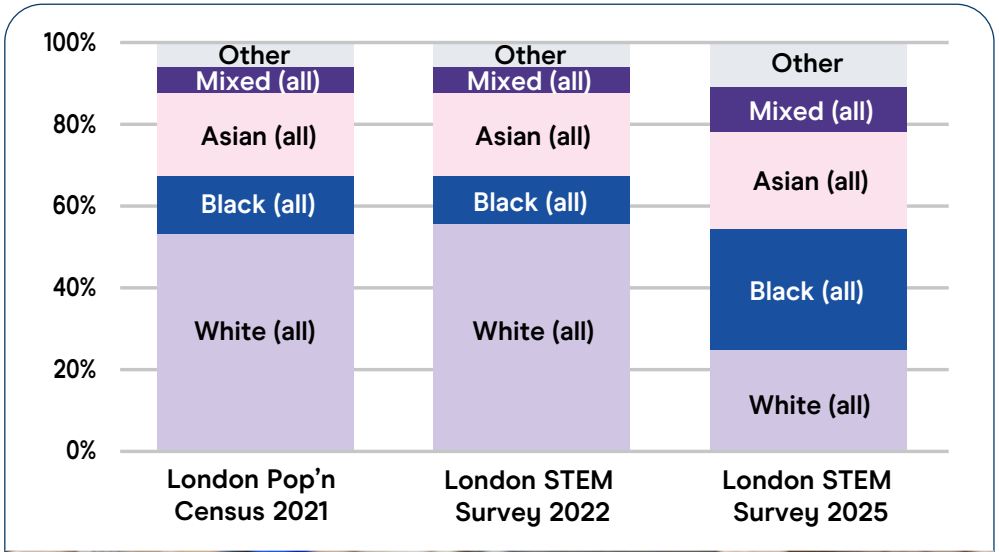
EAL Students
National average: 18.6%

London STEM schools
46.5%

Average rate across schools participating in the London STEM programme 2022–2025.

Increasing diversity and inclusion

Information gathered from a representative sample of students taking part in the programme in 2022 and 2025 observes an increasing diversity in ethnic background, in line with delivering interventions that are designed to target and engage underrepresented communities.



Enhancing diversity and inclusion

84% of students and 88% of teachers surveyed agreed that the sessions promoted engineering opportunities that were representative and diverse.

To build aspirations around STEM it is essential that young people recognise that there are opportunities for them. They need to see 'people like me' in real-world STEM situations.

We seek diversity in our workforce and our partners, and this is having an impact, not just amongst the teachers and pupils, but also on the members of staff and partners delivering the sessions.

> **"Nowrujee and Brandon were enthusiastic, knowledgeable, interesting, well-informed and fantastic at talking to our younger people."**
>
> Teacher, London STEM programme survey 2025

> **The STEM programme has provided the opportunity to do more than just 'give back', I can help young people in schools in London make more positive choices for their futures. In return I have had the chance to add outreach and engagement to my existing responsibilities and develop my skills in other ways.**
>
> Brandon Hamilton, Engineer

Brandon Hamilton (pictured) joined the Trust as an Apprentice engineer and delivers talks in engineering during school visits and STEM career sessions.

> **One of the young engineers is from Tottenham... that went down really well, especially because he was a black male. I think some of the boys recognised themselves in him... He told them what he was doing, working on the canal. They had no idea there were jobs like that.**
>
> Vassa Armitas, Assistant Headteacher, Gladesmore School

Gladesmore is a large secondary school in Tottenham with high levels of diversity amongst students.

> **We need to raise aspirations and expose young people to different careers. I'm motivated to try and help make STEM and engineering more appealing to young people, especially females and we are desperate for engineers. They need to see female role models to give context and know that females can do this role.**
>
> Merlin Davis, Senior Reservoir Engineer

Merlin Davis is a female reservoir engineer and helps to deliver STEM careers sessions to schools.

Celebrating Black History Week

We were able create bespoke, targeted events as part of the programme. For Black History Week we ran a series of workshops exploring the links between science and art (STEAM) through clay, delivered by ethnically diverse communities.

> **“We try to make sure that our students see people that represent them so they can see themselves reflected. One of our students really connected because the artist is also Yoruba. So not only is he Nigerian, he’s also from the same group. He was so excited to see this person that he could relate to and say, ‘that’s me in 20 years!’.”**
>
> Rachael Harvey, Geography and Safeguarding Lead

Addressing the STEM skills gap

The London STEM programme offers activities that are aligned with workforce needs, focusing on skills development.

If we are to encourage more young people into STEM careers, they need to enjoy STEM learning at school. By offering opportunities to experience STEM in the real world that demonstrates the relevance of classroom studies, the London programme is having a positive impact on the enjoyment of STEM subjects.

Appeal of STEM subjects

Student enjoyment of subjects was recorded pre and post taking part in a STEM activity.

88% of students reported to enjoy Maths **after** a STEM activity, compared with **58%** before.

91% of students reported to enjoy Science **after** a STEM activity, compared with **66%** before.

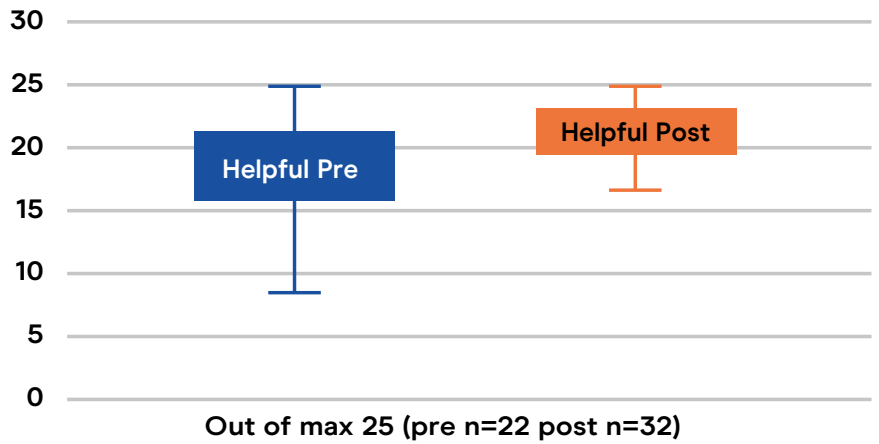
Perceived relevance of STEM subjects

The programme is also having an impact on young people's understanding of the relevance of STEM. An assessment of whether students believed STEM subjects to be helpful for future careers was recorded pre and post programme. From the data collected, the impact on STEM subjects being considered helpful to future careers was statistically significant.

90% of students said Maths was helpful **after** the programme – up from just **46%** before.

3% were unsure **after** – down from **48%** before.

How much STEM is helpful for my future career



Independent samples Mann Whitney U test p<0.01.

Increasing awareness and interest in STEM career pathways

There is a direct correlation between the enjoyment of a STEM subject and the appeal of STEM careers.

Career pathways for young people begin with the subjects they enjoy. If they understand a subject's relevance to future work opportunities it can increase their enjoyment and positively impact the likelihood that they will pursue a related career.

STEM subjects were ranked relevant/helpful for future careers in both surveys (2022 and 2025). The breadth and depth of the more recent STEM interventions has deepened this association.

Subject	Agree relevant to future careers (2022 London STEM survey)	Agree helpful to future careers (2025 London STEM survey)
Maths	88%	98%
Science	72%	95%
ICT	68%	89%

Appeal of STEM careers

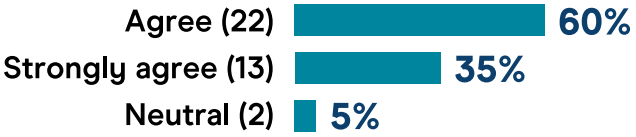
Those who enjoy STEM subjects, register a far greater interest in STEM careers, including those in engineering and nature and conservation.

Students who are interested in a career in medicine, engineering, computing or conservation enjoy the following school subjects:

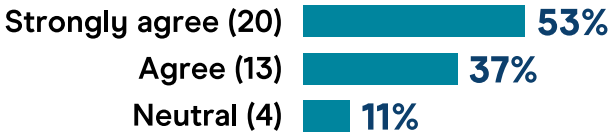
STEM school subjects	Career in medicine	Career in engineering	Career in computing	Career in conservation
Science	80%	81%	83%	83%
Maths	68%	83%	78%	76%
Information and Communication Technology (ICT)	62%	78%	92%	73%
Design and Technology (DT)	58%	78%	83%	75%

Broadening understanding of STEM careers

The session broadened my understanding of STEM careers



The session has made me more interested in a STEM career



95% of young people taking part in the 2025 survey agreed that the session had broadened their understanding of STEM careers.

90% agreed it had made them more interested in STEM careers.

What the students said...

> The practical maths demo was a great way to find out how maths and physics apply.

> I learned about different careers in STEM, I now know what a civil engineer does.

> It made me realise that engineering can take you to work in a wide area of places and I am really excited to see where I can get to in the future.

> I learned that to work in this sector I need to focus on developing my skills, especially the importance of maths skills.

> It's good to know about the availability of apprenticeships in this organisation.

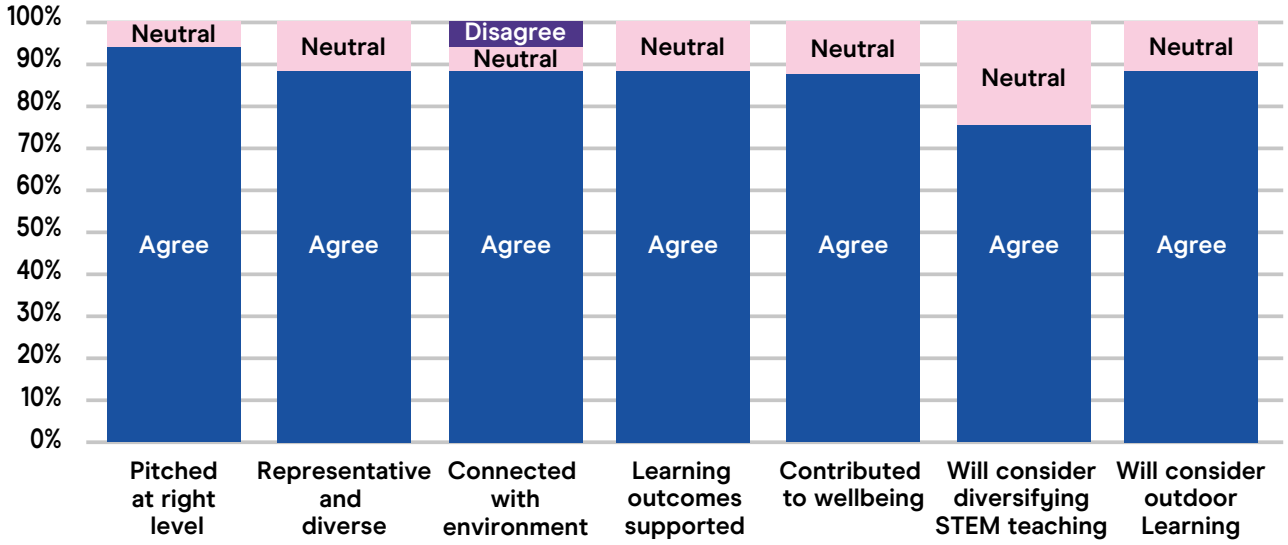
Impacting STEM teaching

A majority of teachers felt strongly inspired to diversify how they teach STEM and, almost all felt inspired to deliver learning outdoors.

A corresponding survey amongst teachers of KS3 to Further Education whose students had taken part in wide-ranging activities including waterside visits, workshops, careers assemblies and webinars revealed consistently high levels of satisfaction with the London STEM programme. They reported that the sessions were informative, pitched at the right level, promoted STEM opportunities and helped students connect to their local area and the environment.

Teachers agreed that learning outcomes are supported, and they would recommend the programme to other schools and colleges. They also acknowledged that the programme has had a significant impact on teaching methods and styles.

How much you agree with these statements



Source: London STEM programme survey 2022

What the teachers said...

> "A very informative session that gave me insight into the roles available so that I can inform other staff and help direct students."

> "The students just loved being outdoors and being connected to the environment."

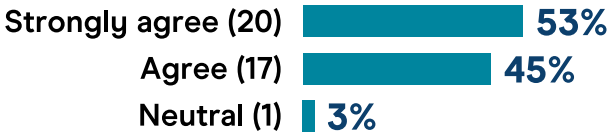
> "Our students greatly benefit from hands-on STEM experiences, careers insights and creative interdisciplinary learning."

> "The visits were highly valuable, giving students opportunities they wouldn't normally have. Nowrujee's leadership and organisation were outstanding, ensuring each session was engaging and impactful."

Impacting awareness of the Trust's role

The London STEM programme is also raising awareness of the Trust's role, helping students understand how the Trust is protecting the environment, and the waterways. 98% of young people surveyed after taking part in a STEM activity in 2025 agreed that the STEM session(s) had demonstrated how the Canal & River Trust were protecting the environment. 92% agreed that it demonstrated how Canal & River Trust is protecting the waterways.

The session demonstrated how the Canal & River Trust were protecting the environment (student responses 2025)



What the teachers said...

"As a careers advisor it was great to upskill my knowledge on STEM careers and specifically the waterways. It is helpful to share this with students who may not ordinarily think of STEM on the water and companies such as Canal & River Trust."

"One student is now aware of the apprenticeship options available with Canal & River Trust and has begun looking at opportunities."

What the students said...

"I didn't know there are organisations that keep our rivers clean."

"I loved the session. Everyone was very friendly. The sessions were very cool and informative, and the place was beautiful."

"I have found this experience extremely informative. The conversations and demonstrations have really deepened my understanding."

"This session sparked curiosity, creativity, and a deeper appreciation for how STEM careers protect and enhance our waterways. Thank you to everyone who made this event such an inspiring success!"

Barbera Cimadoro, STEM Development Coordinator

New opportunities for the London STEM programme

By building relationships and working as partners with the schools that have engaged in the London programme, the team is able to focus on listening to their needs and adapting and extending the programme to meet gaps in learning.

Work experience

Young people in areas of deprivation, often with high levels of unemployment, have the fewest opportunities for work experience, leaving them lacking in skills, experience and qualifications.

We have developed a week-long opportunity for a group of young people to work with our conservation teams, to see how we engage communities, and to explore how technology is helping our work across three London sites.

Students will also spend time on the water, with activities to develop team building and leadership skills, and conservation skills, like surveying reed beds and bridge management.

> **“We can only offer this work experience opportunity to a small number of students at the moment, but the impact could be huge.”**
>
> Nowrujee Ali, London STEM Lead

Extending the London STEM programme

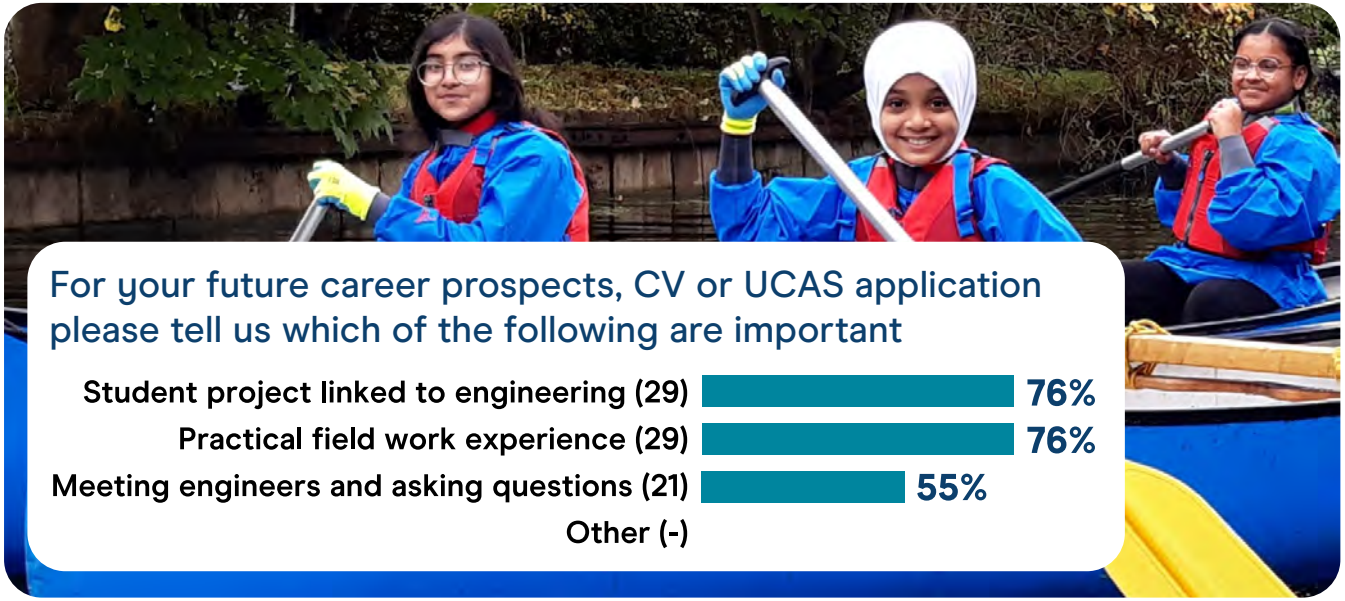
Field studies

It is challenging for schools in urban areas of high deprivation to deliver the required level of field study opportunities for students. The cost of coach travel is a major barrier.

We are currently piloting a GIS river study which will enable schools to use the free open spaces of our waterways on their doorsteps.

Students taking part in the 2025 survey echoed their teachers in highlighting the importance of practical fieldwork experience for their future career paths.

> **“We’re really trying to break down barriers. We want to go further. For example, we know schools are struggling to access GIS data to meet requirements on the curriculum. We have data that schools can use...Advances like GIS are integral in the real world and I’m so excited we can give schools this access.”**
>
> Nowrujee Ali, London STEM Lead

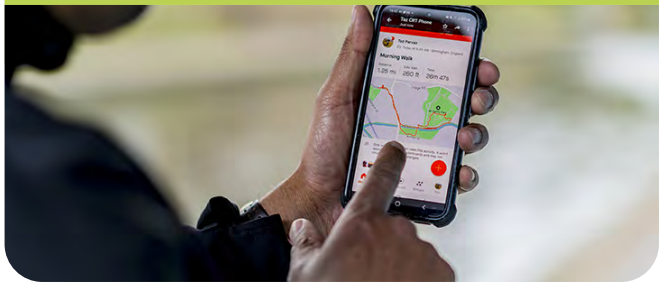


For your future career prospects, CV or UCAS application please tell us which of the following are important

New volunteers

The London STEM programme relies on volunteers to help deliver activities to schools. The relevant, progressive nature of the programme is attracting a growing number of inspiring young people.

> **“The new initiatives have helped to attract new, younger volunteers, who understand how integral new systems like GIS are in the real world. The Trust GIS manager is giving training to interested young volunteers. Another young volunteer helped to create the GIS, recorded information for schools and will help to train other volunteers.”**
>
> Nowrujee Ali, London STEM Lead



> **The STEM programme is the result of a lot of hard work, trying new things and aiming to make it relevant to schools. It's given me a new lease of life!**
>
> Nowrujee Ali, London STEM Lead

Meeting our objectives

Increased participation

Almost 12,000 young people participated in the London project, with outstanding feedback received from young people and their educators.

Enhanced diversity and inclusion

All our activities are representative and diverse, and we seek diversity in our workforce and our partners to ensure young people can see 'people like them.' We engage with schools in some of the most deprived areas of the country, according to the English Indices of Deprivation.

Address skills gap

Our STEM evaluation tool allows us to align activities with workforce needs by gauging skill development and career interest. New initiatives such as work experience and field studies opportunities are continually being developed. A majority of young people report no previous exposure.

Career pathways

Exposure to real-world STEM has a positive impact on the enjoyment of STEM subjects in school, which directly impacts student understanding of their relevance in the real world and a desire to follow a related career pathway.

Raise awareness of the Trust's role

High levels of awareness of the Trust's role in protecting the environment and the waterways are recorded amongst young people and educators participating in the programme.

By aligning our goals with the national curriculum, fostering collaboration and offering comprehensive support to schools, our London STEM programme is paving the way for a more diverse, skilled and engaged STEM workforce, ensuring that young people are prepared to meet the challenges of tomorrow.

Canal & River Trust | STEM

Our thanks to the following individuals and educational establishments for their contributions to this report

- Nowrujee Ali, STEM London Lead, Canal & River Trust
- Barbera Cimadoro, STEM Development Coordinator, Canal & River Trust
- Anna Baatz, Outcomes Measurement & Evaluation Specialist, Canal & River Trust
- Merlin Davis, Senior Reservoir Engineer, Canal & River Trust
- Brandon Hamilton, Engineer, Canal & River Trust
- Rachael Harvey, Wapping High School
- Vassa Armitage, Gladesmore Community School
- Dr Despo Speel, Preston Manor School
- Teachers and pupils at the following schools and colleges:
    - Capital City College
    - College of Hackney and Enfield and North East London
    - Gladesmore Community School
    - Harris Science Academy
    - London Academy of Excellence Tottenham
    - Preston Manor School
    - Wapping High School
    - William Perkins CE High School

Looking ahead

We recognise the importance and positive impact of this programme – and we're committed to building on its success.

If you're interested in finding out more, collaborating, or supporting the programme, we'd love to hear from you.

Get in touch: Enquiries.londonsoutheast@canalrivertrust.org.uk

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