Engage Teacher Conference

EngineeringUK: Boosting the E in STEM

Hear from EngineeringUK about how our Climate Schools Programme, Neon and our free resources can help you inspire your students to consider a career in engineering and technology.

Dan Powell, Head of Neon, EngineeringUK
Nathan March, Head of Engagement Projects, EngineeringUK

Engage Teacher Conference

Engage

Welcome, please be aware:

- Talks are recorded
- You can ask questions in the chat throughout
- There will be time for questions at the end

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- Nathan March, Head of Engagement Projects
- Dan Powell, Head of Neon

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EngineeringUK Priority Schools Approach

- **What is it?** A set of criteria to identify priority schools for EngineeringUK programs, aiming to reach under-represented groups in engineering.
- **Why it's needed:** To address under-representation in engineering.
- **Criteria Calculation:** Based on free school meal eligibility, ethnic minority groups, special educational needs, and rural location, with specific thresholds for primary and secondary schools.
- **Effectiveness:** EngineeringUK has increased its reach to EDI criteria schools across pur programmes, involving more young people from under-represented groups. Our evaluation shows that the we provide bursaries for Priority schools have had a positive impact

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CLIMATE SCHOOLS PROGRAMME

The UK is working towards net zero carbon emissions by 2050 – this will be a big part of your students' lives. The Climate Schools Programme:

- Offers **science**, **geography** and **English lessons** and **extra-curricular club resources** appropriate for **11-14-year-olds**
- Strong skills focus (**teamworking**, **communication**, and **problem-solving**)
- Inspires the next generation **to explore green engineering careers** and **tackle climate change** head-on
- For **UK state-funded schools**

Extras: free green careers resource pack | £10 voucher for giving feedback | £100-250 for doing interviews and session observations

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CLIMATE SCHOOLS PROGRAMME

why?

- Women make up 17% of the engineering workforce, compared with 48% of the overall workforce
- Research by the United Nations has shown that positive messages about how we're tackling climate change reduces anxiety and inspire more activism

  "Participants felt strongly that a more ‘solutions’ focused approach (rather than teaching about the inevitability of climate change) is needed…"
- Energy sector will need to fill 400,000 roles by 2050, 260,000 of which will be new
- Retrofitting in the building sector will require us to train 45,000 technicians each year in 5-10 years’ time

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Communicating on Climate Change, un.org/en/climatechange/communicating-climate-change
EngineeringUK, *Net Zero workforce*, 2022, link
EngineeringUK, *Environmental Sustainability and Engineering,* 2022, link
EngineeringUK, *Trends in the engineering workforce*, 2022, link

CLIMATE SCHOOLS PROGRAMME

why?

- 70% of young people agreed that “engineers are important for improving the environment” and students who agreed were almost 7 times more likely to be interested in a career that involves engineering than those who did not agree
- Only half thought their generation could have a high impact on tackling issues surrounding the environment and climate change
- Fewer than two-in-five (39%) were confident in their understanding of the term “green jobs” when asked, whilst only a fifth (22%) felt informed about the range of green jobs available to them
- Only a fifth (23%) say they are confident in their understanding of green skills

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EngineeringUK, *Environmental Sustainability and Engineering,* 2022, link
WSP and Savanta ComRes, 2022, link

CLIMATE SCHOOLS PROGRAMME

Funded for at least 2023-2026

In 2023-24 we:

- Consulted with teachers and young people
- Built relationships with corporate and professional organisations
- Developed materials demonstrating engineering and technology solutions to climate change
- Tested the programme

2024 onwards

- Expand to 750+ schools

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"What I really liked is the real focus to jobs and future jobs and future hope, like proactive 'this is what can be done' and all that kind of stuff"
- Teacher

CLIMATE SCHOOLS PROGRAMME

Principles:

- **free (or cheap) for schools to run**
- **students…**
  - **become more confident in their ability to have a positive impact on climate change, and can identify potential solutions for climate problems**
  - **understand the roles of engineering and technology in addressing climate change**
  - **have their horizons broadened and are supported to achieve their full potential through development of existing and new skills**
  - **see careers in engineering and technology as suitable for them, regardless of their background, gender, or ethnicity**
- **showcase relatable role models from a variety of backgrounds and pathways into engineering and technology**
- **link with and be complementary to existing climate-focused programmes**

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CLIMATE SCHOOLS PROGRAMME

Priority student statement:

… for all young people to explore solutions to tackling climate change, not just those who already have a passion for STEM.

… enable everyone to see climate action and engineering and technology as relevant to them, and for them to feel more positive about both.

… prioritise the involvement of young people from the groups underrepresented in engineering and technology, who may not currently see it as for them:

- girls
- disabled young people and those with Special Educational Needs
- those from UK minority ethnic backgrounds, including in particular Black, Black British, Caribbean or African young people
- free school meal recipients

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"I could see a lot of them thinking, you know, to try to make connections between the fact that these jobs will be jobs that they potentially are entering into themselves"
– Teacher

CLIMATE SCHOOLS PROGRAMME content

> "You're giving us a bunch of resources that we don't have to spend all day figuring out which is really useful."
> – Teacher

Lessons

Science × 4

Geography × 4

English × 2

- Support curriculum learning
- Educate students about engineering and technology solutions to climate change
- Manage eco-anxiety
- Highlight role models and real-world experiences

Climate Action Club Resources

Biodiversity

Energy

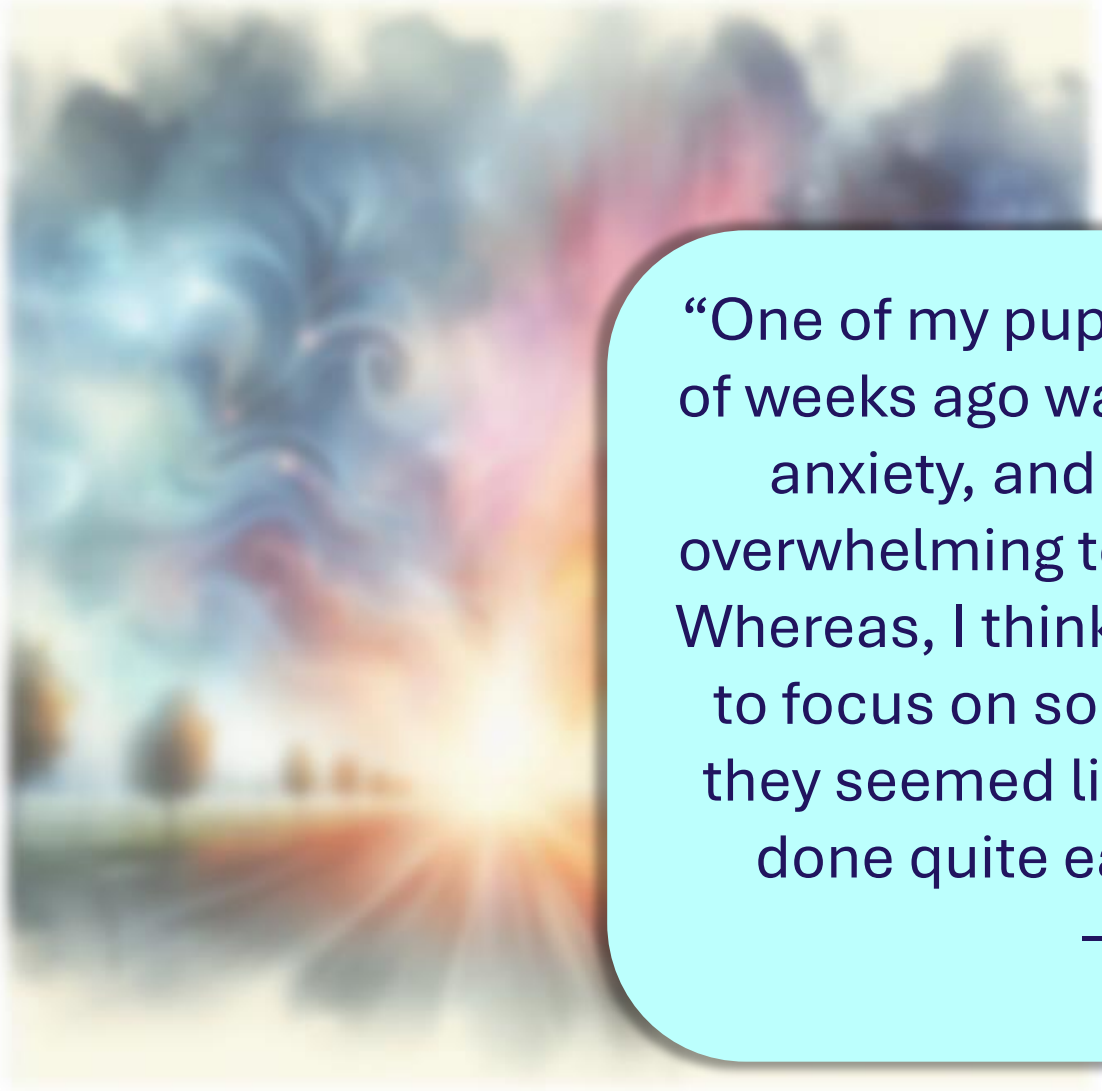
Food

- Student-led, teacher-supported
- For new or existing clubs
- 5 to 10-hour projects
- Support hands-on learning and self-determination
- Develop school's environmental sustainability

Competitions and Awards

- Signpost to existing schemes
- Provide next steps
- Promote celebration and growth mindsets
- Give young people confidence to see themselves in a career in engineering and technology

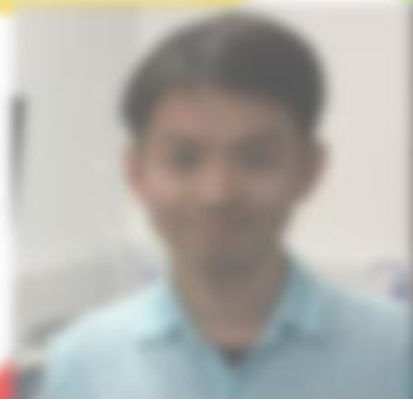
solution-focused climate action | careers in engineering and technology



"My work is to design environment-friendly
collect
such as
ibration
or magnetics
reuse the
rgy in our

"One of my pupils in my class a couple of weeks ago was talking about climate anxiety, and it can become quite overwhelming to think of the negatives. Whereas, I think these lessons seemed to focus on solutions, and you know, they seemed like things that could be done quite easily or manageably"
– Teacher

Philex, electrical engineer



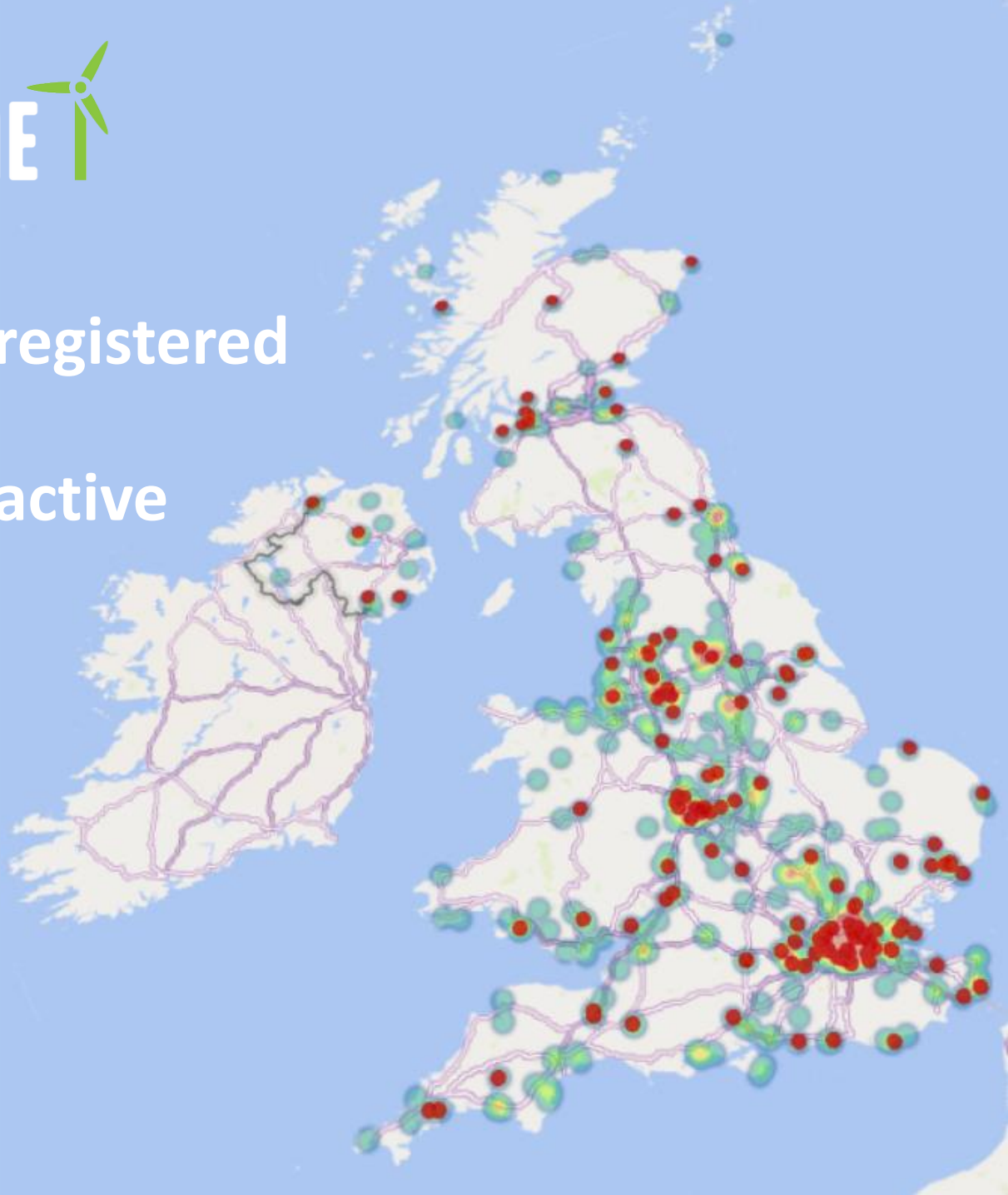
CLIMATE SCHOOLS PROGRAMME

status

"I really I enjoyed being involved in it. The kids obviously enjoyed being involved in it." - Teacher

455 schools **registered**
heat map

134 schools **active**
red dots



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CLIMATE SCHOOLS PROGRAMME

STEM Ambassadors support

Sign up to get remote or in-person volunteer support:

- Climate Action Club projects
- “Tackling Climate Change” delivery
- Support with practical activities during lesson time
- Online Q&A about their work and experience

STEM AMBASSADORS

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Questions?

Next steps

- Register for the Climate Schools Programme climateschoolsprogramme.org.uk
- Join the Community Hub community.stem.org.uk - *search "climate schools programme"*
- If you have any questions, contact csp@engineeringuk.com

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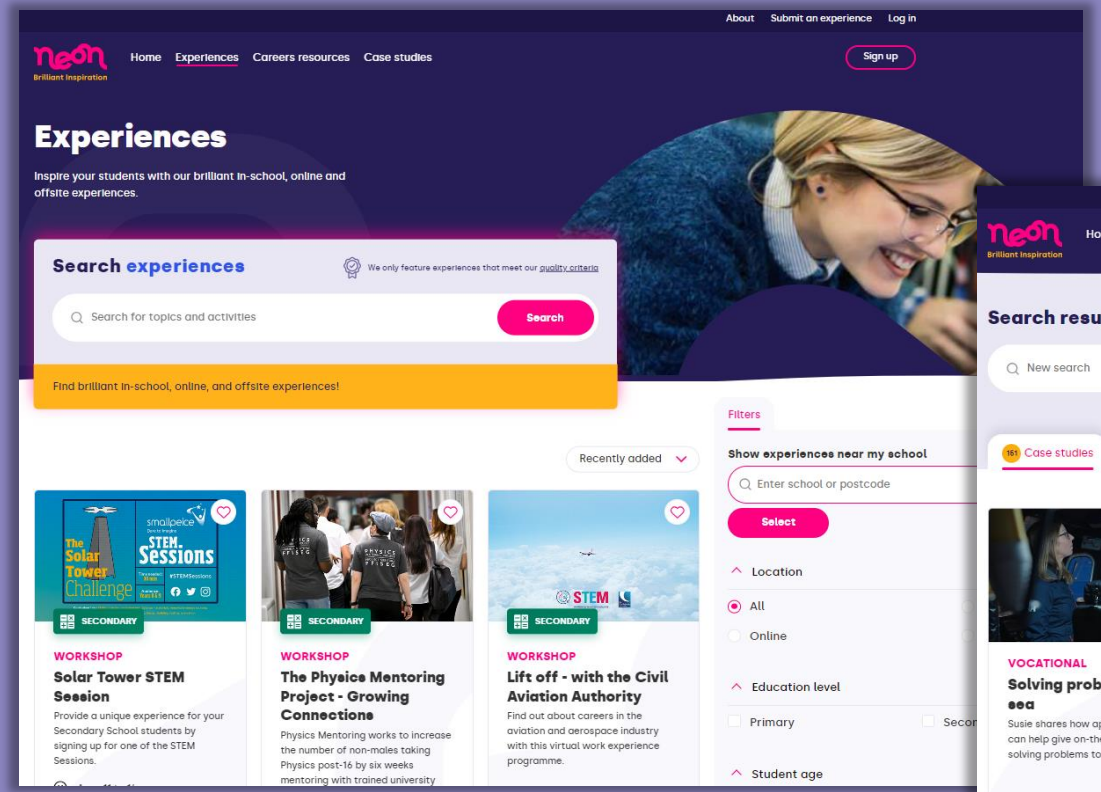
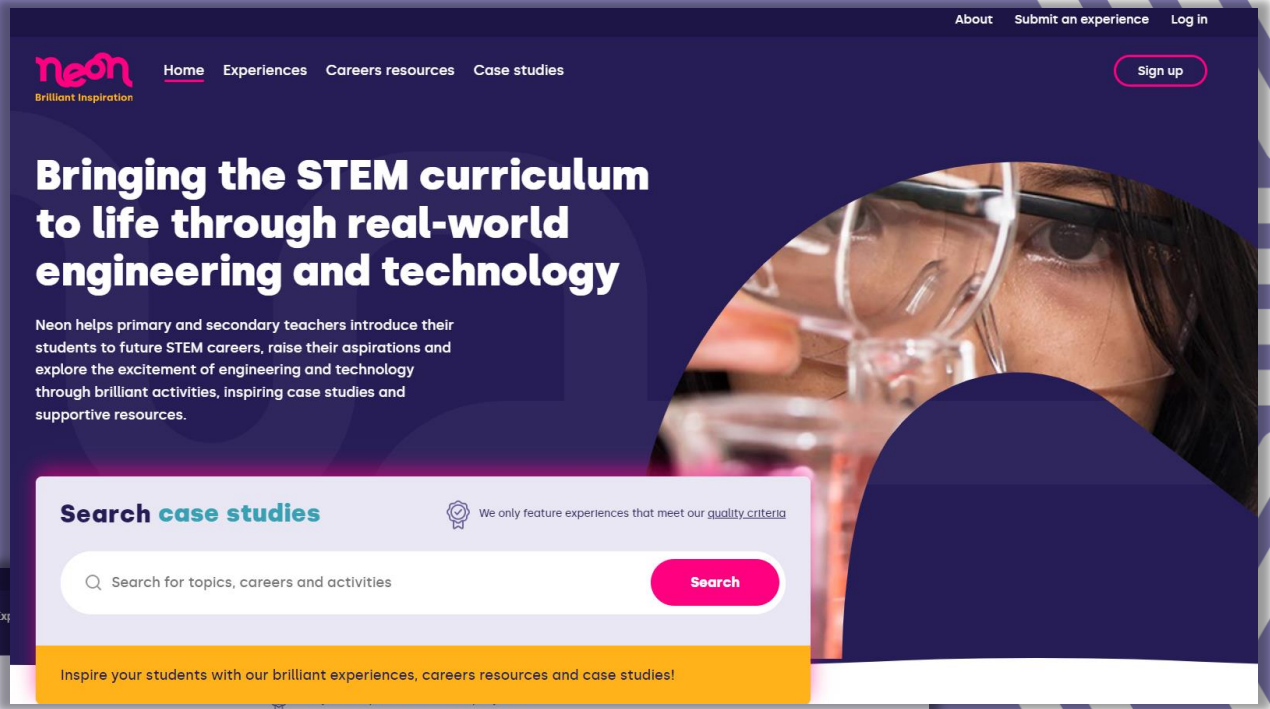
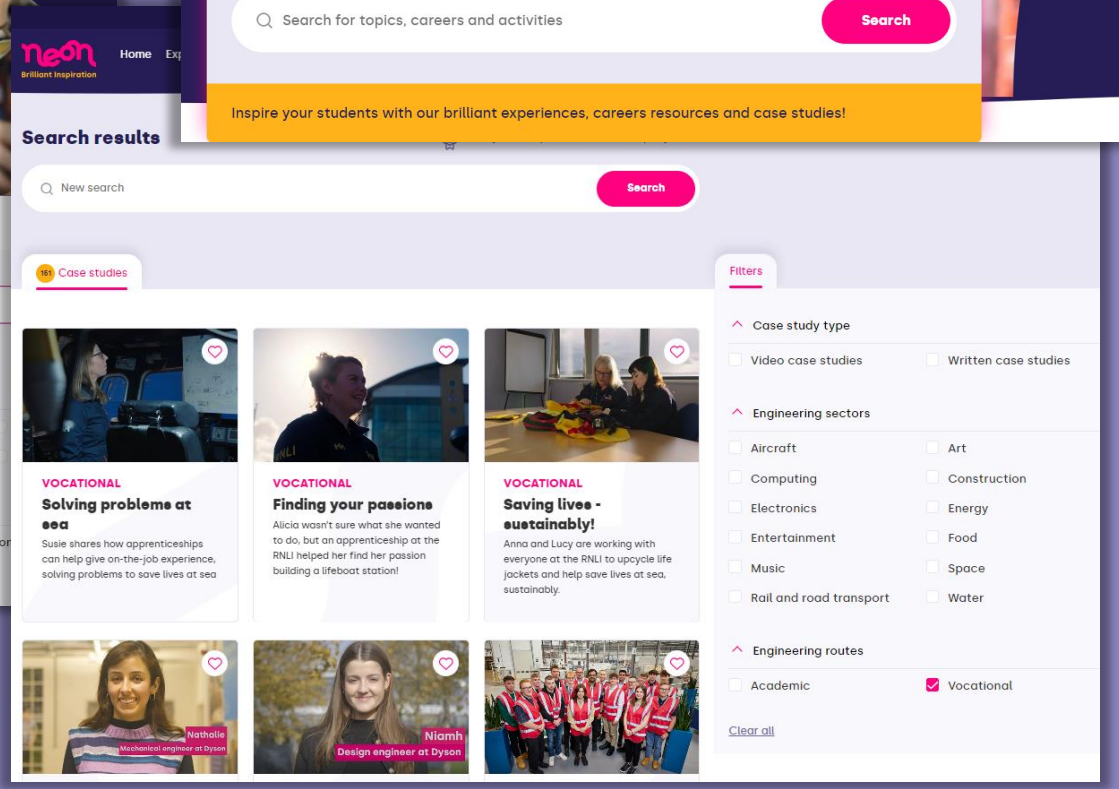
Brilliant Inspiration







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What is Neon?

Neon is a website for teachers which will help you easily find the relevant content you need to inspire your students about a career in engineering.

- 360+ experiences by 110 outreach providers (127 live currently)
- 40 careers resources and 145 case studies (in-house)
- 120,000 users have visited the site since launch, and there have been 400,000 unique pageviews
- Over 6,000 registered teachers and careers advisors
- Used in around half of UK secondary schools

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The Neon Quality Standards

Featured experiences should:

1. Include positive and contemporary messaging about engineering
2. Raise young peoples' aspirations:
    - For primary: Broaden horizons, challenge career stereotypes, and put curriculum subjects into a real-life context
    - For secondary: Include an explicit careers dimension and align with at least 2 Gatsby benchmarks
3. Be designed and delivered to be inclusive for students
4. Be committed to embedding learning and improvements
5. Clearly articulate expected learning outcomes
6. Set expectations around cost and time to the end-user
7. Meet safeguarding, health and safety and data protection standards and have public liability insurance

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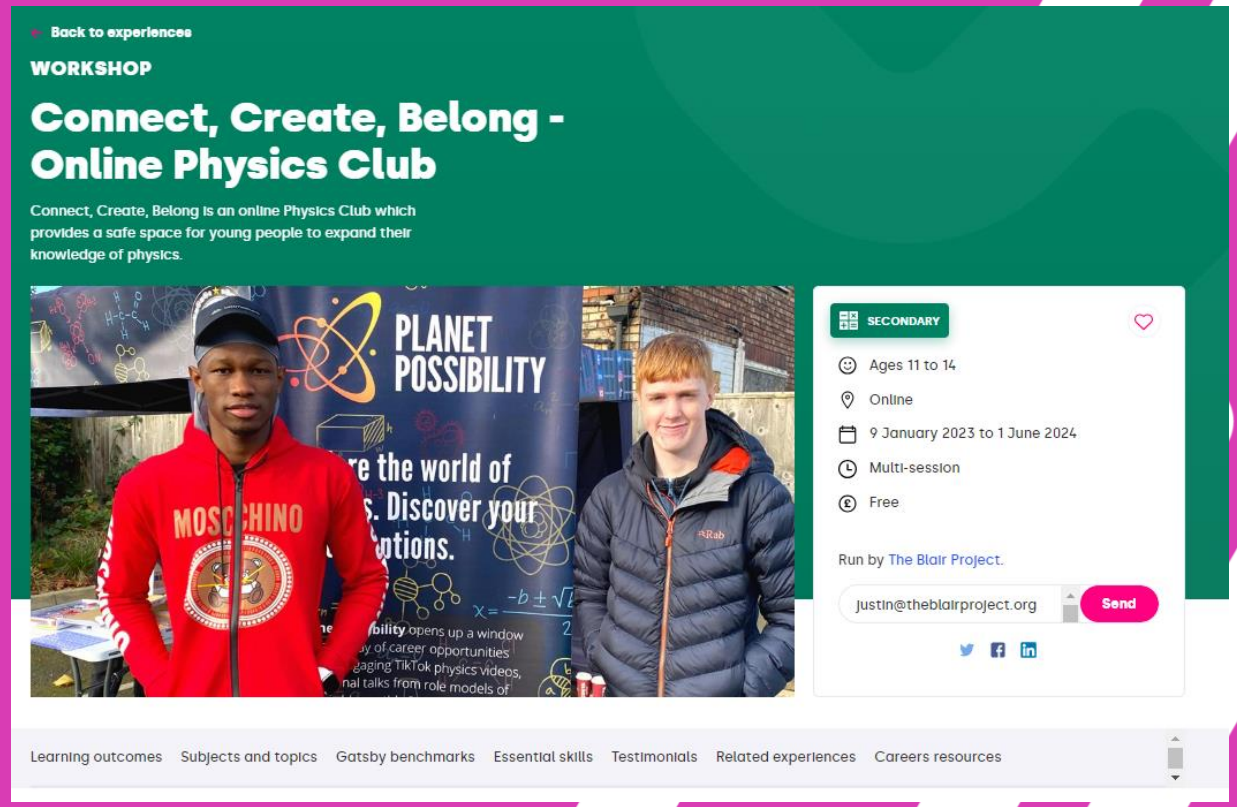
Experiences

Connect, Create, Belong – Online Physics Club

'Connect, Create, Belong' is targeted at young people who would not traditionally pursue careers in Physics, and all guest presenters and volunteers have been picked to reflect the need to bring more diversity into the field of Physics and provide more relatable role models.

'Connect, Create, Belong' aims to inspire the next generation of scientists and inventors to choose Physics as a career and open their minds to all the career possibilities it entails.



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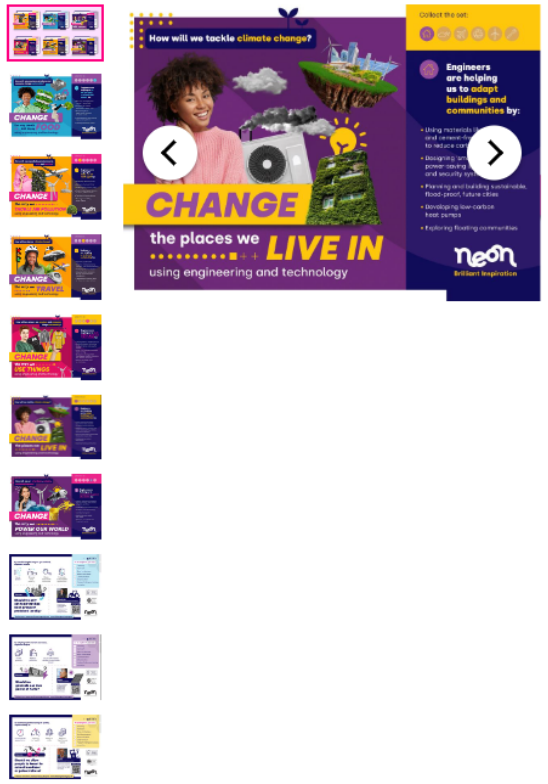
Resources

Green careers postcards

A set of 6 inspiring and thought-provoking postcard-sized handouts showing how people working in engineering and technology are working to achieve net zero and support environmental sustainability.

These postcards can be used alongside our ‘green careers in engineering’ posters, which explore the same 6 themes and include classroom activities and homework tasks.



← Back to careers resources

Green careers postcards

POSTCARDS

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Download the Postcards

This resource is also available to order in print, free of charge. Place your order.

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Case studies

A spark for engineering

Allanah is a software engineer at BT, who switched to an apprenticeship in 6th form to learn directly from industry professionals.

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A spark for engineering

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← Back to case studies

Improving access

Financial support for your school

Find out where to apply for funding and get tips on how to write a great application.

How to apply for funding

A guide to writing effective funding applications.

→ Writing an application

Employer engagement with schools

CEC Careers Hubs

The Careers and Enterprise Company (CEC) Careers Hubs bring together schools, colleges, employers, and apprenticeship providers in local areas across England. The goal is to make it easier for schools and colleges to improve how they prepare young people for their next steps.

Find out more

Careers Wales Education Business Partnership

The Education Business Partnership (EBP) provides opportunities for pupils, their teachers, and often parents, to meet and interact with employers across Wales. These activities aim to inform, inspire, and motivate young people about their career opportunities.

Visit the website

My World of Work marketplace

STEM Ambassadors

Inspire your students

Use these role models to get students excited about engineering careers.

This is Engineering

AFBE school programmes

Black heroes of maths

STEM Ambassadors

Learn from other teachers

Hear from schools across the UK and get practical tips on how to use activities and resources from Neon to inspire your students.

Alderman Peel High School

Secondary School, Norfolk

Amanda Moffat is a D&T Teacher and STEM Coordinator at Alderman Peel High School. Here she tells us about the 2 STEM team building days she is planning for her year 7s and year 8s, made possible thanks to a £700 Neon bursary.

3 experiences | 2 resources

Preston Muslim Girls High School

Secondary School, Lancashire

Becky Holland is the Data and Careers Manager at Preston Muslim Girls High School. She just won a £700 Neon bursary and is busy planning an exciting STEM enrichment day for her whole school.

1 experience | 4 resources

Ashmole Acc

Secondary schoo

Tom Gilfeather is at Ashmole Acade recently coordina engineering day,

3 experiences

Motivate your students | Inspiration for teachers | Financial support | Real life stories | Inspire your students | Learn from other teachers | Employer engagement

Motivate your students

Use these resources to get your students excited about engineering careers, all the different areas it covers and and the different routes they could take to get into engineering.

From idea to career

A guide to 12 different engineering disciplines showing different pathways into engineering, to support students with their career decision-making.

→ From idea to career

All routes into engineering

A 20-page booklet for young people in the UK who are making decisions about their next steps, and the different routes into the sector.

→ All routes into engineering

Engineering in school

STEM Learning resources which bring engineering into your secondary school or college.

→ Engineering in school

IET Posters and career packs

The Institution of Engineering and Technology posters and career packs can be ordered free of charge, or downloaded and printed.

→ Posters and career packs

Bursary scheme

EngineeringUK Priority schools can apply for an annual bursary of £750 to use to deliver a Neon Experience

- In schools that received a bursary, girls, students from ethnic minority groups and students in receipt of free school meals participated in a Neon activity in higher proportions than seen across the student population.
- Over 80% of teachers said that the bursary motivated their school to take part in a STEM activity and allowed them to more effectively reach students from groups under-represented in engineering with enriched experiences.

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Next steps

- Register for a free Neon account https://neonfutures.org.uk/my-profile/sign-up/

- If you have any questions or comments get in touch on hello@neonfutures.org.uk

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Questions?

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Thank you

Neon: hello@neonfutures.org.uk
Climate Schools Programme: csp@engineeringuk.com
Other enquiries: dpowell@engineeringuk.com

crestawards.org/engage

crest@britishscienceassociation.org

Run by BRITISH SCIENCE ASSOCIATION

Managed by CREST AWARDS

Science

Lesson 1A

- Introduction to the green energy transition away from fossil fuels
- Explore (in groups) 2 rooms in a building and 1 vehicle to identify all forms of energy use
- Explore (in groups) 2 rooms and 1 vehicle to work out how to make the energy use greener

1B: Heat

- Explore (in groups) alternative forms of heating
- Present (in groups) what they have learned about alternative forms of heating
- Plenary about most the efficient method

1B: Electricity

- Decide which methods of generating electricity are renewable or low-carbon
- Explore (in groups) how one low-carbon energy source compares to coal and gas
- Present (in groups) about how their low-carbon energy source compares to fossil fuels

1B: Transport

- Explore (in paired groups) different methods to power vehicles
- Discuss (in paired groups) the pros and cons of the different methods to power vehicles

Heat practical
Make a solar oven

Electricity practical
Create a wind turbine and measure the voltage produced

Transport practical
Make a basic electromagnetic motor

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Geography

Lesson 1A

- Introduction to the concept of Net Zero
- Introduction to the My2050 tool
- Explore (in groups), using the My 2050 tool, different pathways for reaching Net Zero
- Feedback each group's results to the class
- Explore and discuss (in groups) what the pathway they have chosen will mean for society and jobs

Lesson 1B

- Explore (in groups) a collection of paper or digital maps to determine some viable sites for a new onshore wind farm
- Create (in groups) a proposal for the best site for a new onshore wind farm
- Present (in groups) their proposal to the rest of the class
- Vote for the best location

English

Lesson 1A

- Discuss, as a class, how memes on climate change make them feel – discuss problem focused rather than solutions focused language
- Analyse (in groups) one or more articles about climate change for techniques used in persuasive language
- Discuss as a class what top tips they would give their friends on identifying problem-focused language
- Individually, students write a rebuttal to a fact-checked speech or article about climate change

Lesson 1B

- Explain different formats of debate and the purpose of a debate
- Choose or create a debate topic on climate action
- In teams, prepare proposition and opposition arguments for the debate using the pre-prepared information sheets or online research
- Run the debate with speakers, judges, journalists, and comments and questions from the floor
- Vote for or against the motion

English debate motions

This house believes:

…that **climate education** should be **compulsory** in **secondary schools**

… that **nature-based solutions** alone will **reverse climate change**

… that **air travel** should be **rationed**

…that **behaviour change** will be enough to **tackle climate change**

"There was space to put your own stamp on it and to consider the needs of your own class and how they were going to respond. So, I did **appreciate that flexibility**." - Teacher

"The articles you gave were **all accessible**, and I was quite **impressed the students wanted to read it**. They were interested in it and they understand it's their future so it's really important" - Teacher

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Climate Action Club Resources

Theme packs

- Biodiversity
- Energy
- Food

"... I think the fact that you had an activity that said 'No idea is a bad idea', I think that really owes to that culture of high challenge and low threat. Making students feel really secure that, you know, there's no wrong answer. So I really, really like that."

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"How to" top-level resources

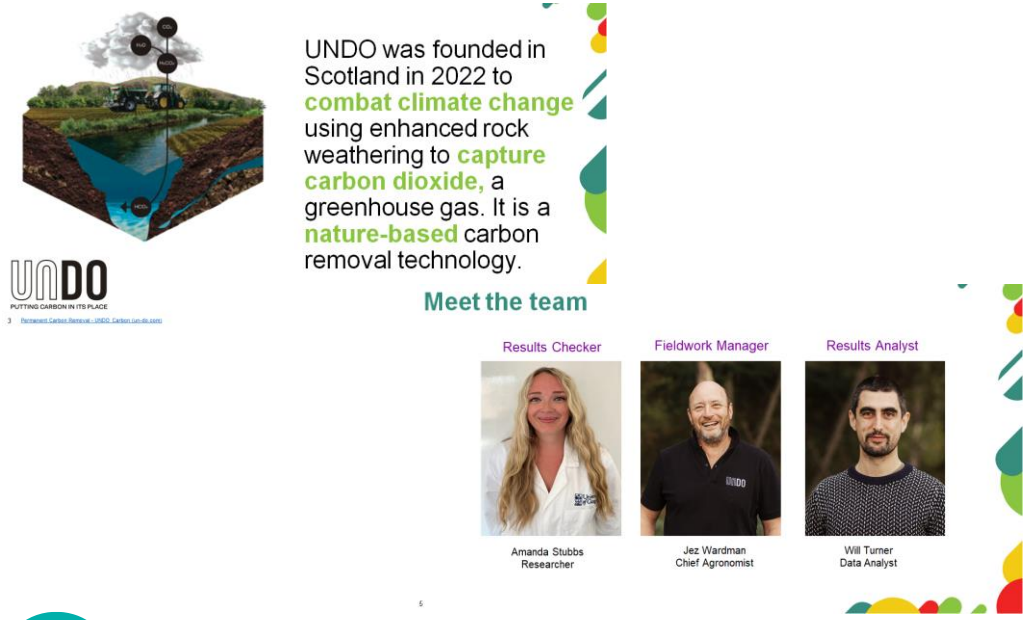
Activity theme packs to last a term or half-term

Skills-based micro-activities for energising students

Guidance on submitting projects for awards and competitions

Ancillary Resources

Adding further value, we produced resources for assemblies, form-time, etc.



Special engineering stories, focusing on an engineering or tech project

Highlight diversity in the teams working on tackling climate change

Showcase individual role models that tackle climate change: skills and career pathways

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