

Primary Engineer®
...the first step



Primary Engineer® ANNUAL REPORT

2023-2024

#EngineersInTheMaking






$$a^2 + b^2 = c^2$$

IF YOU WERE AN
ENGINEER
WHAT WOULD YOU DO?

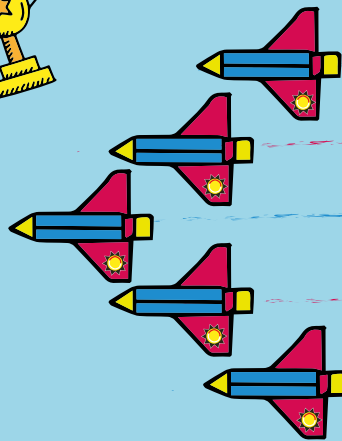
JUDGES AWARD
WINNER 2024
SCOTLAND
SOUTH WEST

Primary Engineer 
...the first step

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Introduction from our CEO



Welcome to the 2023–24 Primary Engineer® Annual Report! As you explore the following pages, you'll see just how busy and exciting the past year has been for us, our supporters and the schools we work with. Our reach extends far beyond the boundaries of the UK's devolved curricula, touching schools from bustling city centres to expansive rural areas. And it's not just about our impact in schools; our 'Engineer Inspirers' have grown to include a vibrant mix of engineers and companies who are passionate about supporting our mission.

This year, we've seen a fantastic increase in the number of engineers volunteering their time and engaging with teachers and students, as well as an increase in the amount of pupils and schools taking part. Their involvement helps us showcase the variety of engineering careers and opportunities, making the field come alive for a broader audience. It's inspiring to see how students' enthusiasm and fresh perspectives can spark excitement in engineers. We've been able to measure the substantial impact of their contributions, proving that our approach is much more than just a fleeting moment – it's about creating lasting memories, developing skills and opening doors to their future careers and interests.

Our Leaders Award competition, with its question 'If you were an engineer, what would you do?' has had a tremendous impact from interviews with engineers and the presentation of certificates to attending exhibitions and celebrating prototypes with the Primary Engineer® MacRobert Medals. It's incredible to see students recognising that engineering is a way to solve problems and make the world a better place and that engineers are the people who do that.



It's a fantastic initiative that harnesses the imagination and creativity of school children and showcases what can happen when you engage children in engineering from a young age. Weir is a longstanding industry partner of Primary Engineer, and I was honoured to be part of the judging panel. We're delighted to celebrate the winners who have demonstrated the very best in engineering and the potential to make an impact in the real world. Congratulations to you all!

Jon Stanton, CEO at Weir Group

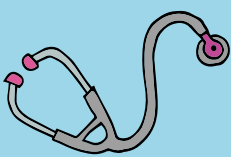
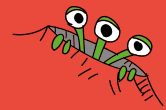




This year also brought some exciting milestones, including the launch of our Primary Engineer® Rail Impact Report, 'Keeping the Kids on Track'. This report considered the impact of the Primary Engineer® Rail Programme, its growth and its impact on teachers and pupils. We kicked off in Wales with GCRE, moved on to the University of Edinburgh and wrapped up at Rail Live, where we introduced primary school students to the event for the first time. Their excitement was matched by that of the organisers, Porterbrook and Bauer Media, and all the other exhibitors. We also celebrated a decade of the Leaders Award with the release of our first book, awarded Primary Engineer® MacRobert Medals at the headquarters of the IMechE in London and cheered on a six-year-old who took home a Gold Medal for her brilliant engineering idea prototyped by the University of Sunderland.

Over the past twenty years, the perception of engineering has been transformed from less of the dirty overalls to more dresses, suits and jeans. We want to extend our thanks to all our supporters, schools and industry partners, and especially to our amazing team who fill the office with stories of the incredible impact we're making. We can't wait to share these stories here with you too!

Dr Susan Scurlock MBE, Founder & CEO Primary Engineer®



Our approach allows our activities to reach particular areas and communities to close inequality gaps and widen ethnicity representation.



2,141 SCHOOLS
Last year 1,256
70% ↑

28% PUPILS DEEMED OTHER ETHNIC ORIGIN

842,846 PUPIL HOURS OF ENGINEERING
Last year 737,696
14% ↑

6,630 TEACHERS
Last year 3,649
82% ↑

14% PUPILS WHOSE FIRST LANGUAGE IS NOT ENGLISH

67 TRAINING SESSIONS

49/51 GENDER SPLIT (BOY:GIRL)
117,047 TOTAL PUPILS
Last year 79,058
48% ↑

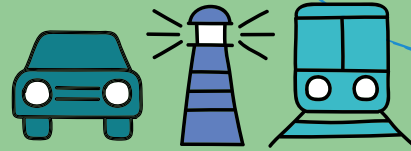
1,608 ENGINEERS
Last year 1,185
36% ↑

44% OF SCHOOLS ENGAGED ARE IN THE THIRD MOST DEPRIVED INDEX (1-3)
based on IoD2019/WIMD2019/SIMD 2020v2/NIMDM2017

208 EVENTS

32% PUPILS ELIGIBLE FOR FREE SCHOOL MEALS

IF YOU WERE AN ENGINEER WHAT WOULD YOU DO?
25 REGIONS ACROSS THE UK



Programmes

Our Primary Engineer® Programmes allow classes in Upper and Lower Primary to take part in a practical project, building the confidence of teachers delivering STEM-based classroom activities that focus on engineering, and raise the aspirations of pupils. Two teachers are trained per school and provided with comprehensive classroom resources, curriculum mapping, links to engineers and enough kit and tools for 60 pupils.

These Programmes are delivered in themes – Rail, Vehicle, Construction and Early Years Engineer – and are designed to inspire an interest in all aspects of engineering from an early age.

The culmination of our programmes sees pupils and teachers reunite for a real celebration of engineering. In a morning that can only be described as 'organised chaos & fun', pupils are encouraged to talk to industry professionals about their experience, what they enjoyed most and how they would improve next time. Pride and self-esteem are purposefully amplified at these events and, according to their teachers, leave children walking just that little bit taller.

This year, we continued to listen to teacher feedback and created the opportunity for celebration events to be held in schools. Our in-school kits allowed teachers to champion all pupils taking part from the classroom, still linking with industry professionals.




!! I must admit that Primary Engineer [has] taught me what DT lessons must be in class – engaging, practical, full of disciplinary and substantial knowledge/vocabulary. I am inspired to redo our Curriculum Knowledge Map asap!!

Airina Narbuntiene, Art & Design and Technology teacher at Portway Primary School

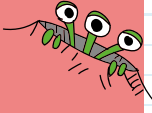



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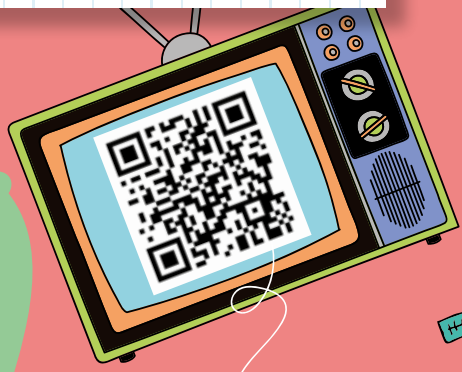
In total, we saw **35,141 pupils**, **1,524 teachers** and **334 engineers** take part throughout the year across our Programmes. This also came with 60 training events and 28 celebration events across the UK. With each programme taking an average of 10 hours, that results in an incredible **351,410 classroom hours of pupil engagement with engineering.**



As a result of our Programmes, pupils are interested, engaged and more aware of careers in engineering. We are helping to break down engineering stereotypes, and we are delighted to represent a 50/50 gender split of participants. We have heard incredible, inspiring stories of pupils who ran home to parents to show off their builds, of those who want to become engineers when they grow up and of how the Programme has been so impactful it has even helped with pupils' behavioural issues.




Our Primary Engineer® Programmes are running again in the 2024-25 academic year with hundreds of schools already taking part across the UK and you can learn more about them at www.primaryengineer.com/programmes/



!! Since the school joined the Programme, we have seen a dramatic rise in STEM subject engagement across the children. We set up an after-school engineering club a couple of years ago which initially saw very few children coming down, but now we have thirteen children, a mixture of boys and girls, attending the club. More and more kids seem to be opting for following careers in STEM, as opposed to the classic desire to be a footballer or a YouTuber. It's refreshing to see. The Morson Projects engineer that has visited the school, Francis, has been great with the children. He's been especially motivating, and is great at showcasing what it is like to work in the industry, which is a brilliant motivator for future career interest.



Mr. Chadwick at St. Mary's School



Scan or click to watch Morson Projects Primary Engineer® Celebration Event





Competitions

IF YOU WERE AN ENGINEER WHAT WOULD YOU DO?®

The Leaders Award Competition is a national competition open to all pupils aged 3–19 and asks the question 'If you were an engineer, what would you do?'. Pupils are tasked with interviewing an engineer, helping them to find the inspiration to come up with their own engineering idea.

Pupils can either interview engineers in the classroom or join our live online interview series where pupils from anywhere in the UK have the opportunity to ask the questions that matter to them. This year, we conducted **22 live interviews** with engineers from a wide range of backgrounds and industries, **broadcasting to 118,872 pupils**. A particular focus this year was to ensure we were supporting teachers to bring different voices and backgrounds into the classroom, highlighting the diversity of engineers in the profession. This meant we heard from engineers from diverse backgrounds and diverse disciplines – all of them helped inspire pupils to think like engineers and recognise that anyone can be an engineer.



Scan or click
to watch 'Meet an
Engineer Online
interview James
the LEGO Designer'



Once they have interviewed an engineer, pupils are asked to identify a problem in the world around them and engineer a creative solution for that problem. They create an annotated drawing of their idea and write a letter to an engineer explaining why their idea should be built. All submitted entries are read and graded by professional engineers, with every single pupil who takes part receiving a named and graded certificate. They are graded based on the quality of the idea, not the quality of the drawing or the grammar and spelling of the letter. Shortlisted entries are then sent to exclusive judging days where the judges select two winners and two highly commended entries from each year group in each region.

Teachers, pupils and their families are then invited to an award ceremony and public exhibition where shortlisted designs are displayed, and the winners and highly commended are invited on stage to receive their trophies, with a surprise awarding of the judges favourite at the end.

This year saw **24 prototypes** unveiled at these exhibitions and award ceremonies, all based on ideas from last year's competition. They were built by ProtoTeams from our university and industry partners working alongside the pupil who originated the idea. You will be able to learn more about this in the 'ProtoTeams' section of this report.

In total, we saw **75,876 pupils, 4,905 teachers** and **1,271 engineers** take part in the competition, with **52% of participating pupils being female**. We also brought engineers together at **47 grading and judging days** as well as celebrating the pupils, teachers and schools at **25 award ceremonies and exhibitions** across the UK.

The competition is open for its 12th year in the 2024–25 academic year and is running in schools across the UK. You can learn more at www.leadersaward.com.



|| We are incredibly grateful to Primary Engineer, as you have without a doubt altered our child's life trajectory. She is incredibly proud of her highly commended award last year, and I know this trophy will fill her with pride. She talks about engineering every day, and it has become a huge part of who she is. The design she has started for next years competition has had us all in tears, and she can't wait to share it with you. We honestly can't thank you all at Primary Engineer enough, what you do is incredibly special and clearly makes such a huge difference to the self-belief of these children. ||

Emily Adams - parent



Scan or click to watch University of Glasgow: Awards Ceremony & Exhibition (Scotland West)

IF YOU WERE an ENGINEER

WHAT WOULD YOU DO?®

THE ALLERGIE SCANNER

The scan that scans your allergies (you can choose what colour it is).

A screen that will turn red if you are allergic and will have a voice box to tell you and it will turn green if you are not and red for the opposite.

The handle where you hold it (will be bigger)

don't touch you are to do with it

If you are to do something you are allergic to that's why it's there

The idea is that it will stop allergic reactions and detect them. It's basically it will help people who don't know what they're allergic to and they will know for next time.

So basically you will say go to the shop you scan butter so if you're allergic it will turn red but if you're not it will turn green or something else.

'Allergy Scanner' by Ivy

Propellers to make it fly

Fiber Tube that processes litter into parts of a heater.

The sucker for litter

Drops the charged batteries ready to go in the heaters.

Button to turn on and off

The maker of heaters that puts all the parts together.

Camera to see where homeless people are.

filter that drops out the heaters

Paintbrush to paint and decorate the heaters.

Magnet that sucks batteries from bins and change them for everlasting charge.

HFH - Heaters for Homeless

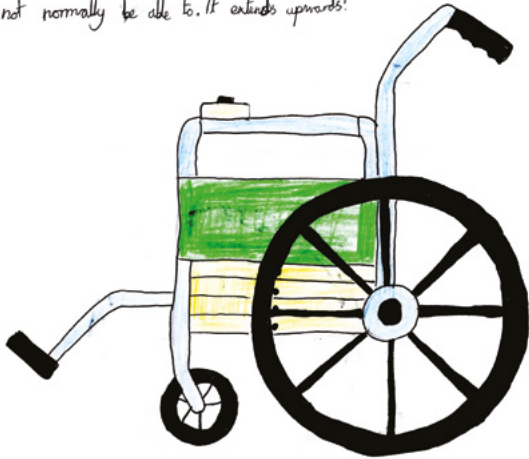
'Heaters for Homeless' by Rida



IF YOU WERE AN ENGINEER WHAT WOULD YOU DO?®

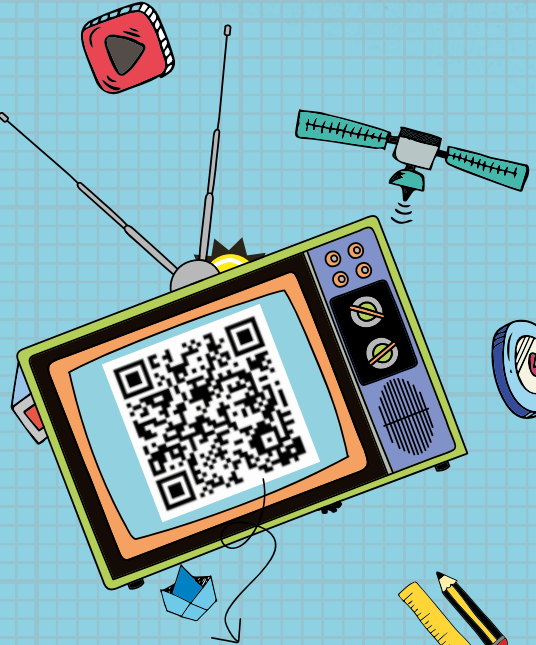
THE Reach-Up Wheelchair.

Life can be a bit tricky when you have to use a wheelchair to get around. The Reach-Up Wheelchair looks like a regular wheelchair but it's not! It helps people reach the things they might not normally be able to. It extends upwards!



Turn over for more information →

'Reach up Wheelchair' by Sophie



Scan or click to watch School engagement with partner National Grid

S blinds

Problem it solves
Nowadays it is a lot of money for heating so the blinds helps by using solar power to heat your home.



solar panels

Lori Simon's P4 Kilbowie Primary School

There is a button on the solar panels to take them off.

The solar panels are removable if it gets too hot to take them off.

comes in different sizes.

comes in 9 colours

'SBlinds' by Lori

$$a^2 + b^2 = c^2$$



IF YOU WERE an
ENGINEER
WHAT WOULD YOU DO?®

2012-2024

KEY:



PUPILS



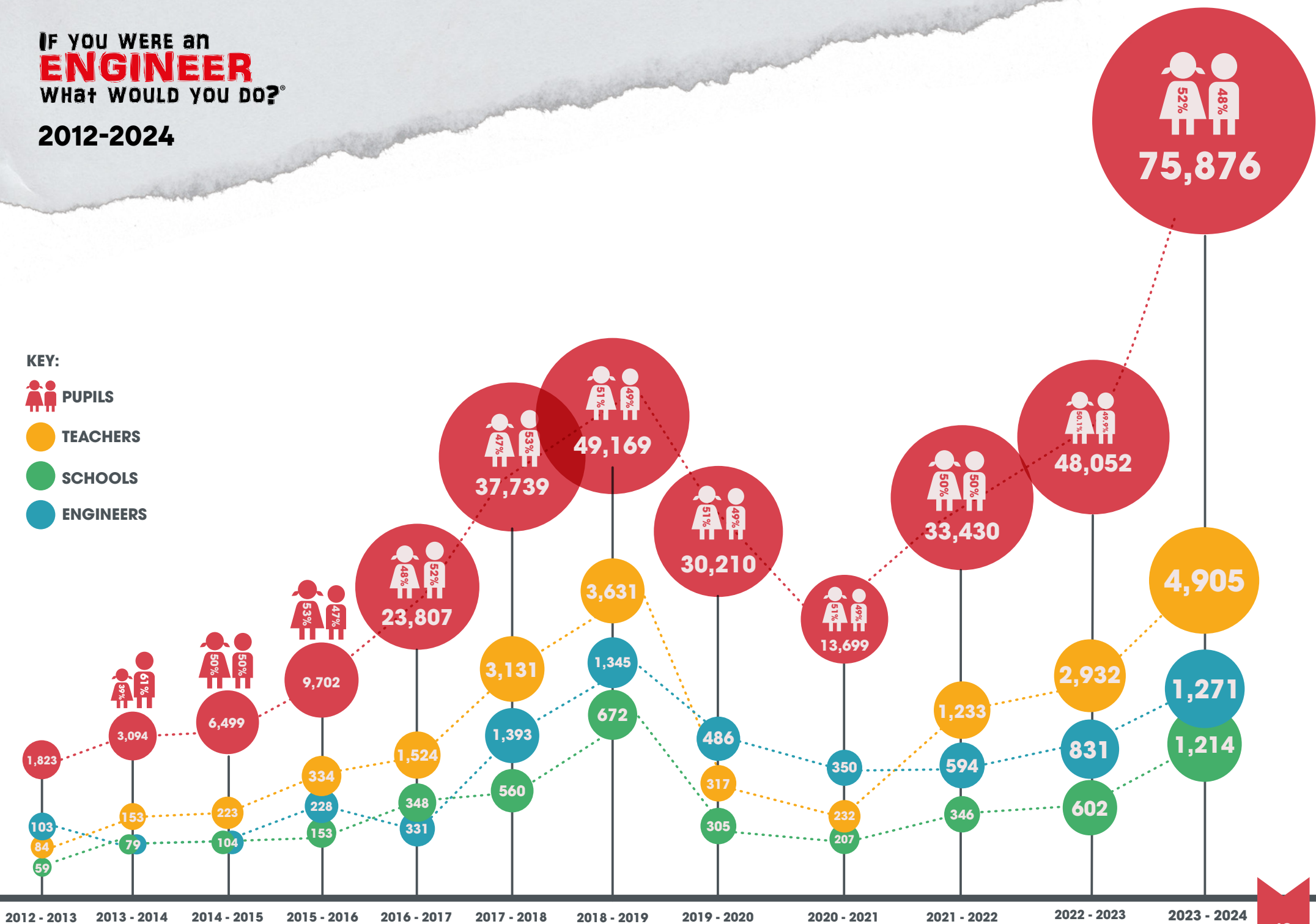
TEACHERS

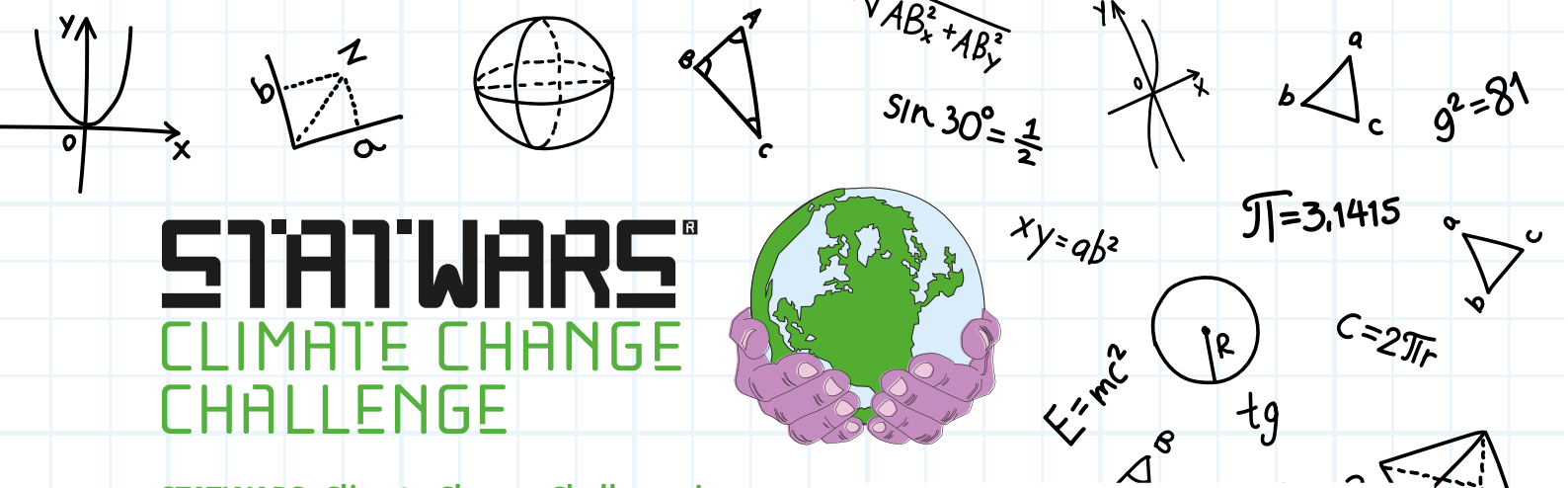


SCHOOLS



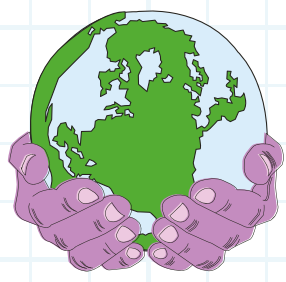
ENGINEERS





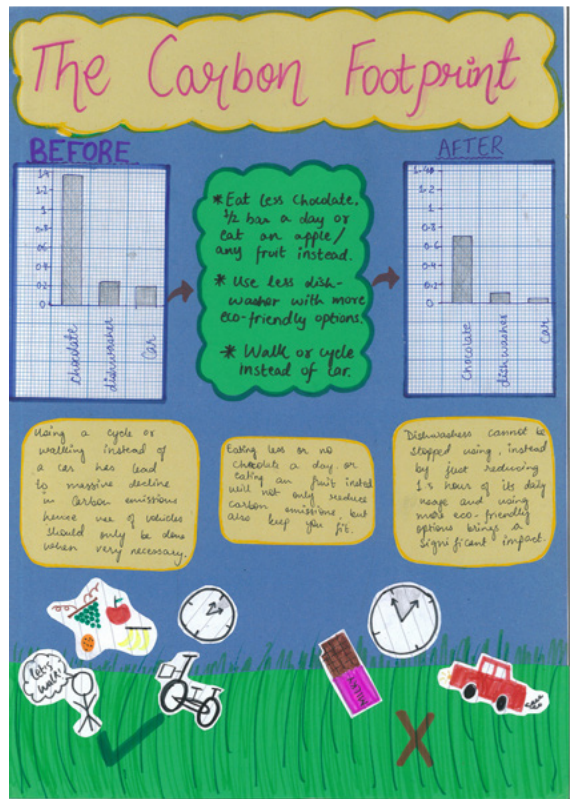
STATWARS[®]

CLIMATE CHANGE CHALLENGE



STATWARS: Climate Change Challenge is a data project with multiple curriculum links to science, mathematics, computing, and engineering as well as english and geography. The competition empowers and educates pupils aged 8–14 to tackle climate change using data they capture themselves. Pupils use our calculator to work out their own carbon footprint, then use this data to identify three pledges they can personally make in their daily lives to help tackle climate change.

Pupils submitted posters, infographics, letters and videos to explain what changes they are committing to make, and why others should too. Some key themes we saw from the pupils this year were to shop locally, walk, cycle or take public transport to and from school and reduce electricity usage in the home.



St Bartholomew's School

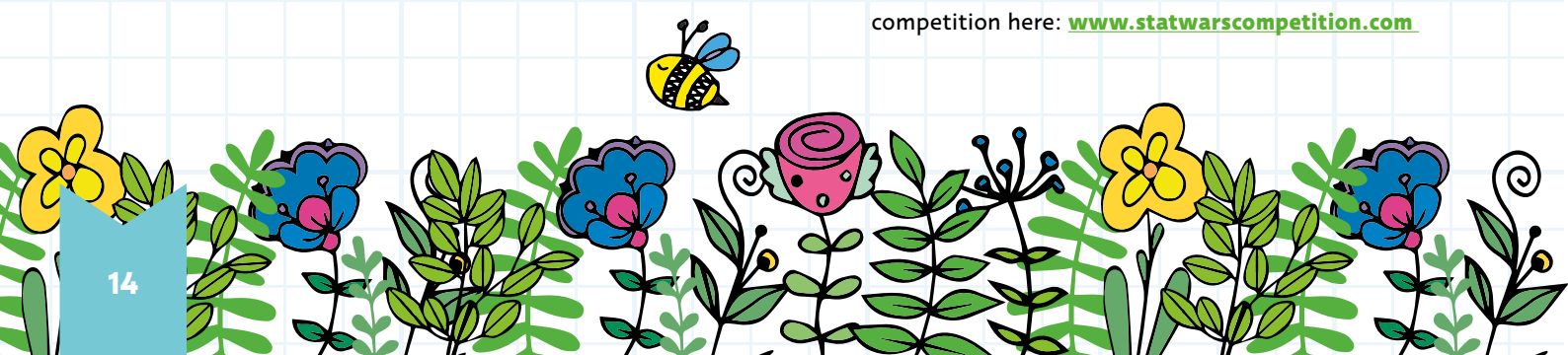
Every single pupil who takes part receives a graded certificate, and up to £5,000 of eco-prizes available to winning schools.

In total we saw **5,370 Pupils** and **179 Teachers**, from **179 Schools**, take part in the STATWARS: Climate Change Challenge.

STATWARS was run across the UK in the 2023–24 academic year thanks to the support of the Royal Air Force Charitable Trust (RAFCT), and they have partnered with us again this year. You can learn more about the competition here: www.statwarscompetition.com



Great Chart School



Qualifications

Our qualifications are for teachers, educators and careers advisors who are looking for more research-based professional development. They are designed to enable teachers and practitioners to further their understanding of the engineering sector, engineers' skill sets and career pathways into the industry.

Our **Engineering STEM in the Classroom** course was delivered across Ireland this year in partnership with Engineers Ireland. It focuses on teachers learning more about engineers, engineering and career paths. This enables teachers to plan and develop an engineering and STEM themed curriculum and embed it across the school. The course features a combination of guided and self-guided study over 14 hours.

In 2024 we launched **Engineering a Career**, a course that identifies the links to engineering in every school subject, meaning that pupils who show aptitudes for engineering in any subject can be encouraged to look at that career path. The aim is to demonstrate that subjects outside of core STEM subjects are valuable to a career in engineering. This course was launched with the support of Ford Philanthropy through Global Giving and the RAF Charitable Trust, who both provide bursaries for participants, and it is now live in 2024/25 for teachers across the UK.

You can learn more about our qualifications and bursaries here:

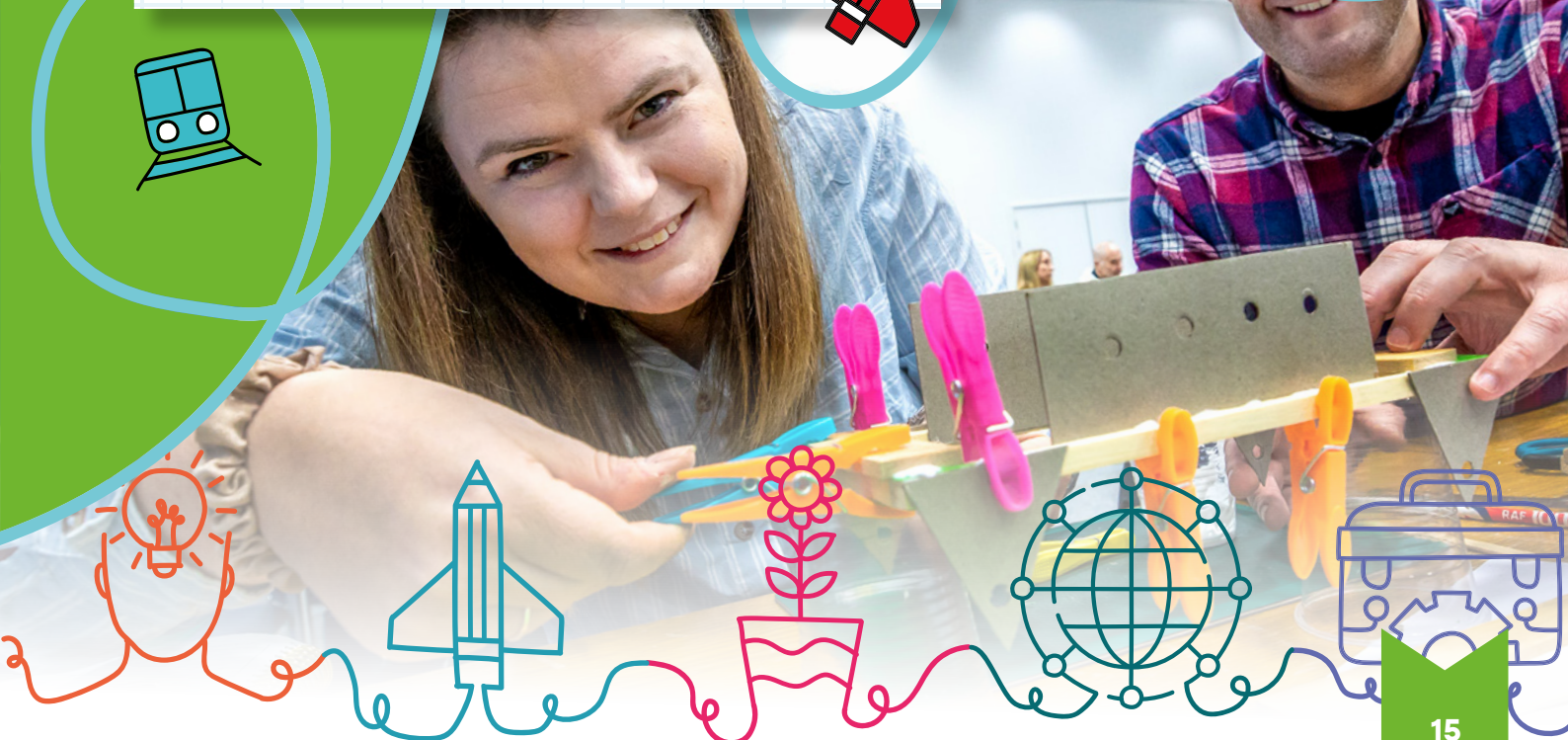
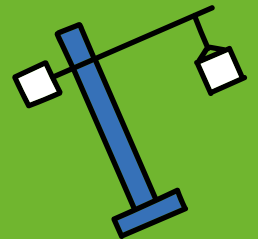
www.primaryengineer.com/qualifications/

" Massively improved subject knowledge and how to successfully deliver DT to children. Amazing experience! Fantastic that resources and assistance provided... Thank You!

Best training day I've had in a decade! "

Joel, Asquith

ENGINEERING
a career





Ulster University
'The Careful Kettle'
by Thomas Y7



THALES Building a future we can all trust
'Solar Powered Heated Blanket'
by Rebecca P7

ProtoTeams

Primary Engineer® ProtoTeams form part of the Leaders Award Competition, furthering engagement between schools, pupils and our university and industry partners. ProtoTeams select from a range of pupil designs or ideas, choosing one to prototype across the next academic year, with this being exclusively available for our Regional and National Partners.

The teams engage with the pupil and school to showcase how engineering can bring their ideas to reality. ProtoTeams are also encouraged to provide updates to Primary Engineer®, enabling a wider audience of schools, industry and the general public to also follow the build. The engineers working in the ProtoTeams experience the challenge of thinking outside the box, with ideas that can be staggeringly simple and conversely complex to design and build.

2023–24 saw ProtoTeam involvement grow yet again with **14 university and two industry partners building 24 prototypes**. Students, technicians, graduates and apprentices incorporate the prototype into their studies and career development.

After the prototypes are unveiled at our exhibitions and awards ceremonies, applications open for the Primary Engineer® MacRobert Medal, a collaboration between The MacRobert Trust and Primary Engineer® to recognise the innovation and creativity of the next generation of engineers.

There were **17 prototypes shortlisted** and **10 will receive Bronze, Silver or Gold Medals in November 2024** at the Award Ceremony in Glasgow.

You can see the full list of medallists, and learn more, here: www.primaryengineer.com/primary-engineer-macrobert-medal/



University of Sunderland
'Self-Regulation Bracelet'
by Zoeya Y3



THALES Building a future we can all trust
'Smart Tap'
by Seyi Y4



University of Southampton
'Seed Planting Drone'
by Emily Y2



'Bunny Inhale'
by Hawa Y5



THALES 'Walkie Frame'
Building a future we can all trust by Erin Y7



'Moving Solar Panels Roof'
by Sam Y6



'Satiat Aranea'
by Charlie Y6



'Power Saving Kettle'
by Lucas Y3



'The anti-shake Mug'
by Cara Y8



'Clean Water Access Bot'
by Ben Y5



'Sign Right'
by Scarlet Y6



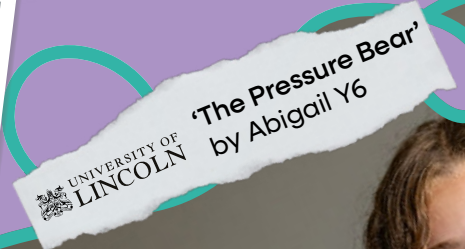
'Handy Greywater Pump'
by Charlie Y3



'Switch-a-Boot'
by Noah Y6



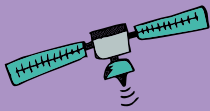
'Glow Bot'
by Iona P1



'The Pressure Bear'
by Abigail Y6



'Tap of Germs'
by Madiha Y8



Industry Prototypes

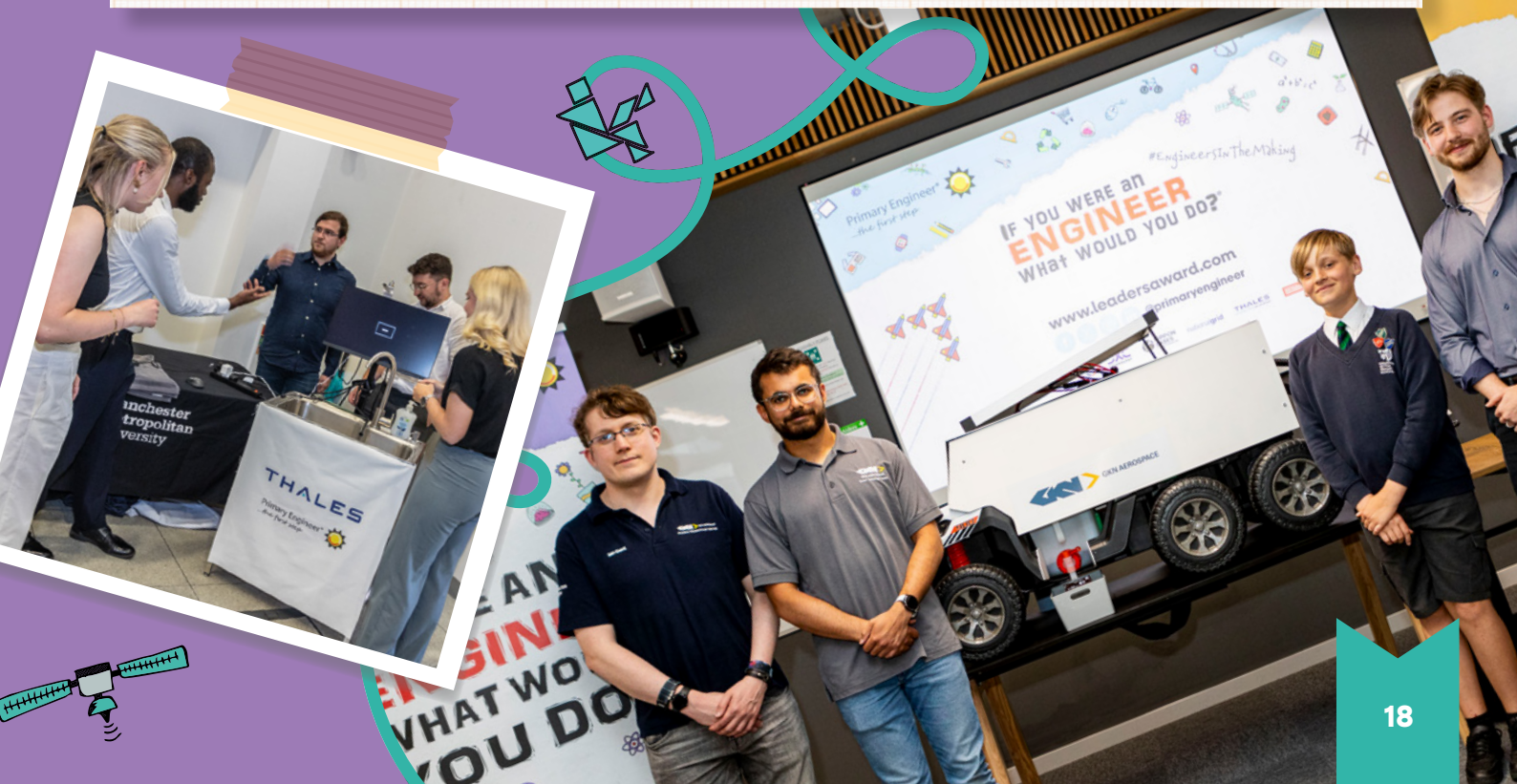
Last year Thales, a National Partner for the Leaders Award Competition, put a ProtoTeam forward to select an idea and became our first Industry Partner to build a prototype. They chose the Face for a Plant, a plant pot that uses emojis to communicate what it needs. They successfully unveiled the prototype in Glasgow and went on to win Gold at the Primary Engineer® MacRobert Medal Award Ceremony.

After this experience, Thales decided to add five more ProtoTeams – one from each of their UK sites – to build five more Prototypes. Teams from Belfast, Cheadle, Crawley, Glasgow, and Templecombe all selected shortlisted ideas to build and worked with the pupils and schools, unveiling them at our Exhibitions and Awards across the country, as well as competing against each other at this year's Primary Engineer® MacRobert Medal.

This has not only been about STEM outreach and engagement, but Thales have used this as part of their Early Years Careers programme, giving graduates and apprentices diverse opportunities to work on exciting projects that matter to the nation. It also gives the ProtoTeam experience in working towards the needs of an external client, and in this case the client is a school pupil.

After Thales involvement last year, we welcomed our second Industry ProtoTeam in 2023/24 when GKN Aerospace came on board and built the Clean Water Access Bot. The C.W.A.B is a robot that can travel to remote locations, collect and purify water, and deliver it to people in need. The GKN Aerospace team worked alongside the pupil throughout the building process, including inviting him to their Global Technology Centre in Bristol to show him the first iteration of the prototype and invite him to give feedback on their design.

The dedication of the teams is evidenced by the fact all five of the ProtoTeams from Thales, and the team from GKN Aerospace, are medalists in the 2024 Primary Engineer® MacRobert Medal – showing their approach and hard work has not only produced high quality prototypes, but they have left a lasting impression on the pupils, teachers and schools they have worked with.



Primary Engineer® MacRobert Medal

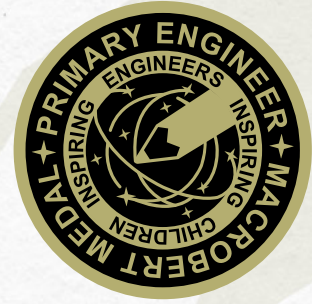
In November 2023, we hosted the official Primary Engineer® MacRobert Medal Ceremony, which celebrates the people who have turned the ideas of school pupils into reality by creating a prototype. School pupils, teachers, university students and engineers travelled to London for the prestigious event hosted at the headquarters of the Institution of Mechanical Engineers.

Each year, our university and industry partners choose from the tens of thousands of entries pupils submit to turn one into a prototype. They form ProtoTeams who work with the pupil who originated the idea to turn their design into reality. The Primary Engineer® MacRobert Medal was created in partnership with The MacRobert Trust, with ongoing support from Weir Group, and the judging panel consists of leading figures from industry.

Jon Stanton – Chief Executive Officer at WEIR Group PLC – was on the judging panel and presented the gold medals at the award ceremony.

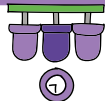
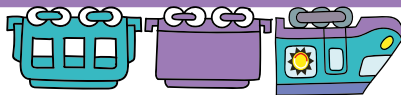
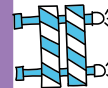
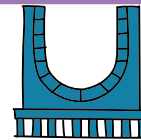
"It's a fantastic initiative that harnesses the imagination and creativity of school children and showcases what can happen when you engage children in engineering from a young age. Weir is a longstanding industry partner of Primary Engineer, and I was honoured to be part of the judging panel. We're delighted to celebrate the winners who have demonstrated the very best in engineering and the potential to make an impact in the real world. Congratulations to you all."

In 2024, 24 Prototypes were built, 17 shortlisted and 10 will be Medallists, with this years' Award Ceremony will be held in November at the Barony Hall in Glasgow. You can see the full list of winners and learn more here: www.primaryengineer.com/primary-engineer-macrobert-medal/



Keeping Kids on Track:

Evaluating Five Years of The Primary Engineer® Rail Programme.



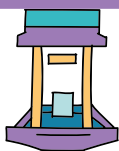
2024 saw the launch of a 5 year report into the impact and effectiveness of our Primary Engineer® Rail Programme. 'Keeping Kids on Track: Evaluating Five Years of the Primary Engineer® Rail Programme' looks at the impact the programme has had on pupils, teachers and engineers, as well as highlighting the scale of what we have all achieved together.

Beginning in the 2018–19 academic year, the Primary Engineer® Rail Programme partnered with Hitachi Rail and delivered into 50 primary schools, serving around 2,500 pupils. Each subsequent academic year, the programme has expanded, with 2023–24 being our biggest year yet. Over the course of five years the Primary Engineer® Rail Programme has provided 40,000 rail engineering learning opportunities across England and Scotland, expanding its reach to Wales in 2023.

Throughout the Programmes history we have seen partners fully embrace the opportunities to inspire pupils through rail - Siemens Mobility, and their work in Goole, East Yorkshire, are a great example of this. Siemens have committed to building a Rail Village that will bring 1000 jobs to the area, and they have worked with us to engage with the local schools. They host training and celebration events on site, as well as training engineers before going into schools to make sure they deliver the best possible experience for the teachers.

Scan or click to watch and see how we work with Industry through the Primary Engineer® Rail Programme





To publish the report, we decided to host three launches, in Wales, Scotland and England, to explore the impact this has had on the specific curricula, as well as how we can continue to address the skills gap. We launched in Neath with GCRE, Edinburgh with the University of Edinburgh School of Engineering and alongside Porterbrook and Bauer Media we ran a one-of-a-kind event at Rail Live – all done with the support of the Department for Business and Trade.

In Wales and Scotland, leading figures from industry, education and government came together to explore the report's findings and discuss the revelations about the transformative power the programme. In Neath, we hosted a closed roundtable that focused on how we can build a bright skills future for the rail industry in Wales, while in Edinburgh, we hosted an open panel that delved into strategies for addressing the skills gaps in the Scottish rail sector.

For the launch in England, we partnered with Porterbrook and Bauer Media to host a unique event at Rail Live, an exhibition that brings the entire rail industry together in a real railway environment. We invited school pupils to take part in a timed rail engineering challenge, compered by Neil Robertson from the National Skills Academy for Rail, alongside senior industry professionals. The session opened with the launch of the report, highlighting the positive impact of companies like Porterbrook getting involved in the Primary Engineer® Rail Programme. This resulted in a joyous activity that saw people like Richard Hines, HM Chief Inspector of Railways, Porterbrook CEO Mary Grant, Andrew Haines, CEO of our partner Network Rail, and Emma Porter, Managing Director of Story Contracting, being instructed how to complete the challenge by a group of pupils as young as 8 years old.

Special arrangements were made to allow people under the age of 18 on site, so this was the first time pupils, and their teachers, got to experience Rail Live. Because young people had never been allowed on site before, the pupils walked around like VIPs, with everyone stopping to say hello, asking to take photos, and inviting them to visit their stand and learn about different aspects of the rail industry.

The findings of the report, and the feedback from our launches, overwhelmingly support the Primary Engineer® Rail Programme is successful in its objectives. Young people are inspired by engineering, develop richer understandings and interests in rail engineering and express a desire to learn more about engineering following their experiences.

Read the full report here: www.primaryengineer.com/keeping-kids-on-track/



Scan or click
to watch Primary
Engineer® at Rail
Live 2024



PROGRAMME TIMELINE

The Journey So Far

2018/19

Primary Engineer launches the Primary Engineer Rail Programme in collaboration with Hitachi Rail.

Partner(s) 1

50 SCHOOLS

circa **2500 PUPILS**

2019/20

The Primary Engineer Rail Programme is launched for a second year. Adjustments to the programme are made to support online delivery in response to the Covid-19 pandemic.

60 SCHOOLS

circa **3000 PUPILS**

Partner(s) 2

2020/21

Despite ongoing interruptions due to the Covid-19 pandemic, participation with the Primary Engineer Rail Programme grows. Network Rail and Doncaster Council join Hitachi Rail as key partners.

150 SCHOOLS

circa **7500 PUPILS**

Partner(s) 3

2021/22

The Primary Engineer Rail Programme grows further with thirteen new partners and reaching 269 schools across England and Scotland.

269 SCHOOLS

circa **13,450 PUPILS**

Partner(s) 16

2022/23

Partner(s) 18

276 SCHOOLS

circa **13,800 PUPILS**

The Rail Programme continues to grow with new partner organisations supporting contact with 276 schools. The Programme is launched in Wales for the first time with Welsh language resources.

2023/24

Partner(s) 22

332 SCHOOLS

circa **15,700 PUPILS**

The Rail Programme continued to grow with more pupils, schools and partners than any previous year. This year also marked the publication of a report into the impact of the Rail Programme, as well as hosting an interactive challenge with VIPs and Pupils at Rail Live

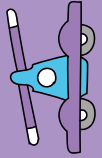
BETWEEN 2018 AND 2024

TOTAL PUPILS: **55,950**

TOTAL SCHOOLS: **1,137**

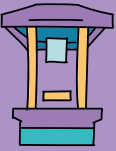
TOTAL PARTNERS: **31**



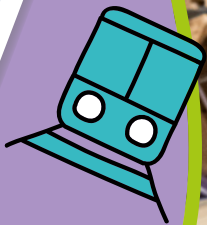


"We are proud to support the Primary Engineer Rail Programme, an initiative that aligns perfectly with our commitment to fostering innovation and education within the rail industry. By providing STEM opportunities for primary schools, we are investing in the future of engineering and railway technology. This partnership not only enriches the educational experience of young students, but also strengthens our community's connection to the rail sector. We are excited to see the impact of this Programme on inspiring the next generation of engineers."

Rob Mullen, c2c Managing Director



Scan or click to watch Primary Engineer® Rail Programme Celebration Event with Porterbrook





Events and Conferences

Royal International Air Tattoo

We returned to the Royal International Air Tattoo for our third successive year with the RAF Charitable Trust, who – alongside DXC Technology – are national partners of the Leaders Award Competition. This year saw exciting developments to the Inspire Stage, which welcomes speakers and live interactive shows designed to inspire and educate the young people attending the airshow.

Some standout shows were our interview with Carl Robertshaw, exploring how kites took him from the Superbowl to space; smashing stereotypes with Miss UK and Miss America; a session on the Science of Spying with GCHQ; McFly's Tom Fletcher and – of course – The Red Arrows. The stage also featured recorded interviews, carried out by Primary Engineer®, with senior figures in engineering and aerospace – Carl Starr, Emma Hatton and Krystina Pearson-Rampeeree all spoke about their journeys into engineering, some of the amazing experiences they have had, and shared some advice to any guests thinking about becoming an engineer.

Outside the Inspire Stage, Primary Engineer® ran a series of engineering challenges in the Techno Zone, which saw thousands of young people coming to learn and engage in all things STEM. Our engineering activities were a huge hit, with visitors receiving Mission Badges for completing a series of challenges. Almost 2,000 young people came to engage over the weekend, with many people recognising Primary Engineer® because their school took part in one of our programmes or competitions this year.

We were supported by volunteers from Boeing over the weekend, who acted as real-world examples of engineers to the young people who took part in our engineering challenges. Massive thank you to Ole, Rowan, Kia, John, Ben and Weronika who all played a massive part in making a memorable experience for those who visited, and went a long way in helping to inspire the next generation of engineers.

LCRIG Learning & Innovation Festival

This year we joined the Local Council Roads Innovation Group, kicking off this partnership by attending their Innovation & Learning Festival. In their exhibition area, we showcased some of the engineering ideas from the Leaders Award Competition which focused on improving the roads. This demonstrated that by engaging school pupils and raising awareness of career opportunities in roads and highways, we can inspire the next generation of engineers to solve the problems of today.



$$a^2 + b^2 = c^2$$

Farnborough

We worked with Boeing at the Farnborough International Airshow this year to support **Pioneers of Tomorrow**, a dedicated STEM-focused event designed to inspire and engage the next generation of aerospace leaders.

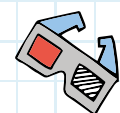
Throughout the day, we spoke with engineers and pilots who highlighted the exciting opportunities available with a career in engineering and aerospace, as well as the pathways to working in the industry.

We hosted three sessions:

- **Taking Flight: Apprenticeship Experiences in Aerospace.**
- **Tales from the Flight Deck: A Test Pilot's Journey.**
- **Soaring High: Opportunities for Women in Aerospace.**

These panels and interviews gave the young people in the audience a view into the industry they wouldn't get in other situations and gave them the opportunity to ask the questions that mattered to them – cementing to them that anyone can be an engineer, and that the aerospace industry is for everyone.

In addition to our work with Boeing, GKN Aerospace brought their Prototype to exhibit at the airshow. The Clean Water Access Bot was on display in their pavilion, proving a popular attraction to all visitors. This not only highlighted the amazing work of the ProtoTeam, but also the dedication from GKN Aerospace to showcase their commitment to inspiring the next generation of engineers.



Engineering Professors Council Annual Congress

This year we supported the **Engineering Professors' Council (EPC)** at the **Engineering Academic Network's Annual Congress**. Supporting their theme of **'Engineers for the Future'**, we hosted a panel session with some of our university partners discussing how developing prototypes has helped improve their outreach to schools.

Our founder and CEO, Dr Susan Scurlock MBE, was joined on stage by our partners from The University of Edinburgh School of Engineer, the University of Sunderland and Cardiff University School of Engineering.

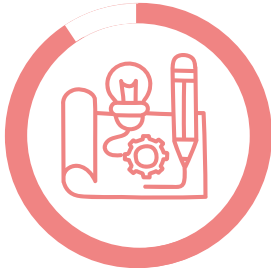
The panel, chaired by EPC's Chief Executive Johnny Rich, explored how each university has used our ProtoTeams activity to conduct outreach in a different way – with some using it to bring pupils into the university, and others using it as part of wider university outreach to go into schools. This helped highlight how universities can effectively work with primary schools, something that was widely discussed in the run up to the congress.



Our Impact

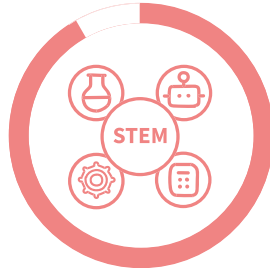


90%



of teachers report an increase in their understanding of engineering following our training

92%



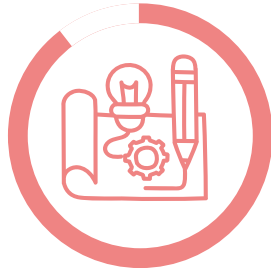
of teachers reported our projects are of high value to teaching STEM generally

98%



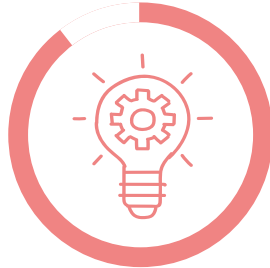
of teachers agree or strongly agree their pupils have enjoyed taking part in the project and found its content interesting

87%



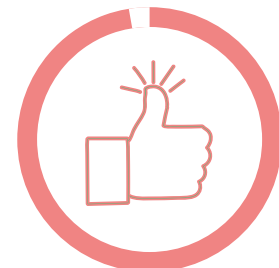
of teachers agree or strongly agree they are now more confident with the subject of engineering in the classroom

89%



our activities spark a powerful understanding of engineering's value, with 89% of teachers observing a clear change in their pupils' perspective

98%



nearly every teacher, would give their enthusiastic thumbs-up to taking part

95%



of teachers would deliver the project again

88%

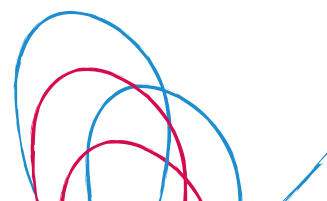


of teachers report a better understanding of the diversity challenges in engineering and the belief that they can make an impact on career aspiration

84%

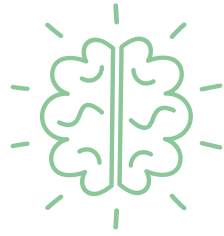


of teachers agree or strongly agree pupils feel that engineering is a career anyone can pursue after involvement





Nearly three out of four teachers delivered activities in a way that included the entire class or more



Two out of Five of Teachers taking part in our activities have no STEM teaching Specialism



Two-thirds of pupils were better behaved in class



Almost 9/10 of teachers are more comfortable talking to pupils about Engineering Careers



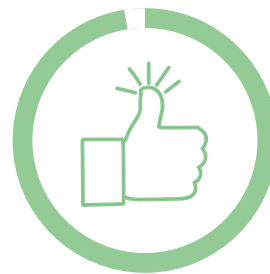
Almost 4/5 of teachers agree or strongly agree to the value of careers-related learning in their school

88%



of teachers were more confident with the subject of design and technology in the classroom

98%



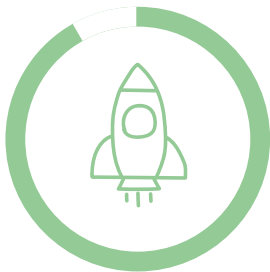
of teachers reported their students had enjoyed learning about engineering

94%

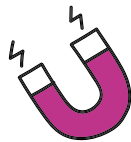


of teachers reported that their students were curious about engineering

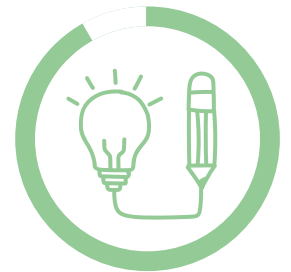
92%



of teachers reported that their students were inspired to learn more about Engineering and STEM



91%



of Pupils wanted to learn more about engineering





Alannah

On the surface, we take engineering into classrooms across the UK through our educational engineering activities, but at the heart are moments and stories which shine a light on the impact this has on individuals. One of those individuals is Alannah, a young pupil from Yorkshire and Humber who took part in our Leaders Award competition for the first time with her school in 2023 and then again in 2024.

We heard Alannah's story for the first time when her mum reached out to us on Facebook: **"She proudly talks about how she is going to be an engineer when she grows up."**

They did not anticipated the positive impact our activity would have on her confidence, self-esteem and budding interest in engineering and her mum has continued to update us on Alannah's passion for engineering.

Read more of her story here

www.primaryengineer.com/when-i-grow-up-im-going-to-be-an-engineer/

" Firstly, I'd like to say a huge thank you to Toby for coming in and helping us! It was a brilliant couple of days, and the success our children experienced was all down to Toby's expertise and enthusiasm. They were so thrilled when their train units moved, and it was a brilliant experience for them to work alongside an engineer as, all too often, children only learn about such careers in hypothetical scenarios.



Thanks again, Toby!! You made a real difference to the experiences our children had, and they will remember it for a long time to come (I still remember a Y6 visit to a Women in Engineering event that I went to when I was 11, so around 27 years ago!! These things last. "

Catherine Hunter, Stillington Community Primary School

" Every primary school teacher needs to do this training! "


Rebecca, Ysgol Bro Tawe





"I love Primary Engineer's holistic (and fun!) approach - it takes many years to build and enthuse the pipeline of talent so it's fantastic that girls and boys have the opportunity to get involved early, and to share their ingenious ideas! Well done all!"

Iona Davis, Principal Engineer (CEng MICE) at Port of Dover



"The most valuable part of the Programme was it opened up pupils understanding of STEM careers and the broad role of an engineer."

Shabana, Norwood Junior School, London

"I absolutely love this initiative. It's so important to introduce #Career topics early on and not just rely on careers guidance at secondary. I am sure there were some very creative answers to the "If you were an Engineering what would you do?" and why not! - the sky is the limit right?!"


Helen L Russell, Apprenticeships & Early Careers Consultant | The Right Track Consultancy Ltd

"Working in a deprived area, these strategies are invaluable!"

Elizabeth, Barmston Village

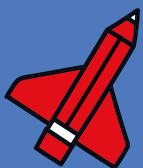
"It's nice to have such a great impact on the local community. To be here providing our expertise and trying to get the kids into an engineering or railway career path is really fun and rewarding. We're teaching them that anybody can get into rail engineering and that it is a fun and fulfilling field to be involved in."


Ricky Stebbings, Alstom Shift Production Manager




"I say this for context not ego..... I have experience of designing high profile products for the automotive industry, travelling the world to visit supplier chain and customers. YET... Unveiling prototypes for the Leaders Award will remain a career highlight. I remember when it happened for me but there is something so special about seeing your idea, your design in the flesh for the first time!"

Dave Knapton, Principal Lecturer, Associate Head of School for Engineering - University of Sunderland





"As a DT lead, the CPD and resources you delivered allowed us, a small primary school with limited resources, to deliver teaching that would previously been beyond our expertise. It matches our National Curriculum requirements in DT perfectly and we now understand how to teach it...this was not the case previously.



Not the most exciting 'story' but literally without this project, we'd still be really struggling to deliver a suitable project involving mechanisms and the various other skills the children developed. Thank you."

Steven Connelly, White Mere Primary School



"We thoroughly enjoyed participating in the Primary Engineer project and working closely with the engineer. The project provided our students with invaluable hands-on experience and insight into the world of engineering. Our engineer mentor was incredibly engaging, sharing her expertise and inspiring our students with real-world applications of engineering principles. The enthusiasm and curiosity sparked by this collaboration were evident in every session, and we are proud of the skills and knowledge our students have gained. This experience has truly enriched our curriculum and ignited a passion for STEM among our young learners."

Airina, Portway Primary School



"We are a school in a fairly deprived area. We do not often see success in competitions against other schools so we were so proud to have a winner and a highly commended entry. The classmates of both these pupils were so excited and pleased for them. It was lovely to watch them celebrate when we announced it."

Michelle, Dalneigh Primary School

"You are amazing! I read the article recently which predicts that DT might be vanished from school curriculum in the future as unnecessary subject for many reasons: costs, students' interests, etc. If every school does a project with Primary Engineer, I think people will change their mind about DT - there is a certain way to get students excited about building, making, designing, presenting and celebrating. I learnt it via Primary Engineer projects. Our students loved this project!"

Ai Rina, Online





"It was wonderful that no matter the age of the child they could take part in the competition."
 "Two of our foundation children got a winners award and two Year 1 children got winner awards. My headteacher and myself both attended the awards ceremony. The children all receiving a certificate was fantastic too!"

Gill Hardy, Olney Infant Academy



"Just wanted to thank you for having me yesterday and today at Stillington Community Primary School.

I have to say it has been a real pleasure to see the children showing the attributes of an engineer - Teamwork, Resilience, initiative, supportive to each other and have fun. I can still remember their face when the train unit moves!

I hope my involvement has been useful and inspiring. I hope this may encourage a few (if not more) of those children to be an engineer."

Toby Tsang, Senior Design Engineer Network Rail



"A group of girls had very little interest in the project at the beginning and were reluctant to get involved until they realized they were better at sawing the wood than some of the boys! They have since looked into women in engineering and one of them has taken a great interest in careers available. In her words... 'Miss Bell, did you know girls can be engineers too? That will be me one day!'"

Sarah, Chiltern Primary



"The children who are not meeting age related expectations in academic subjects, really shone here which was brilliant to see. It gave their confidence a boost and allowed them to take the lead and help others."

Kathryn, Ashfield Park



"One child who can struggle was so engaged within the classroom. Following this task, he was able to concentrate, lead and thrive as he enjoyed the hands-on task. He said, 'This is so cool; we have never had tools like this in school before!' So, thank you for providing us with such a great opportunity."

Christian, Cadle Primary



"We had particularly strong engagement from female pupils this year. One now actively wants to be an engineer as stated that she 'wants to be the next Albert Einstein and design/build something that she will be remembered for.'"

Lisa, Lord Blyton Primary School

OUR PARTNERS & SUPPORTERS

THANK YOU!



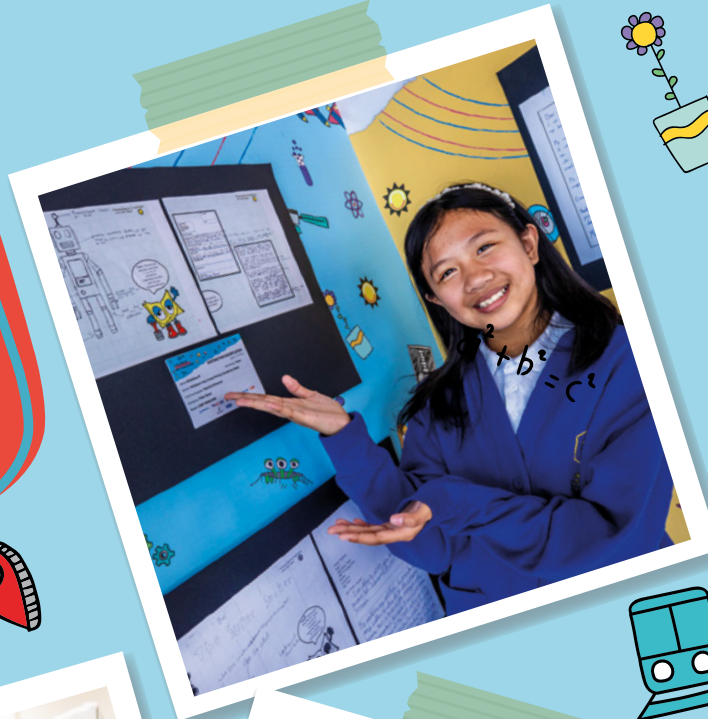
GET INVOLVED AND JOIN US



Be part of the story, visit

www.primaryengineer.com

#EngineersInTheMaking



PRIMARY ENGINEER PAIR CHALLENGE

PRIMARY ENGINEER PAIR CHALLENGE

Primary Engineer
...the first step



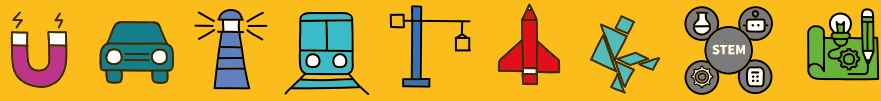


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...the first step



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