The Great Exhibition²

Impact Report

Introduction

Now in its fifth year, The Great Exhibition² (GE²) Schools Programme continues to inspire the next generation of inventors and innovators.

Designed and delivered by Big Ideas in partnership with Imperial, GE² draws from the rich legacy of the Great Exhibition of 1851 and translates it into a vibrant, hands-on experience for pupils aged 7–14 across Westminster, Kensington & Chelsea, and Hammersmith & Fulham.

In 2025, GE² reached hundreds of students and teachers across 18 schools, in tandem with British Science Week. Each participating class worked with real-life scientists and engineers from Imperial to explore the past, present, and future of innovation, culminating in creative invention workshops in the classroom that saw the students hold their own Great Exhibition in their classrooms. Finally, Big Ideas produced a film highlighting the inventions and prototypes that students made and presented in class, and this film was screened for the public at the The Great Exhibition² tent, at The Great Exhibition Road Festival. Imperial researchers and scientists were live in the tent all weekend supporting visitors to build their own prototype inventions out of plasticine.

Programme Aims

- Introduce young people to the legacy of the Great Exhibition of 1851 and its contemporary relevance
- Empower students to explore creative problem-solving through invention and prototyping
- Increase access to real-world STEM role models, from diverse and underrepresented backgrounds
- Support teachers to deliver purposeful science curriculum with real world applications.
- Offer Imperial researchers a valuable opportunity to develop public engagement skills, particularly with underserved youth in London
- Strengthen community engagement by connecting local families to the Great Exhibition Road Festival

Imperial mentor works with children in a Great Exhibition2 workshop during British Science Week 2025

Programme Highlights

- 19 schools participated (14 primary and 5 secondary)
- 552 pupils took part in invention workshops
- 10 Imperial researchers and engineers served as mentors
- 20 in-person workshops delivered during British Science Week (March 11–13).
- 20 class presentations and inventions showcased in Big Ideas film at the Great Exhibition Road Festival
- Over 3,700 people visited the GE² Tent during the festival weekend
- 949 people created and displayed plasticine inventions in the GE² Tent
- 100% of tent visitors surveyed found the activities engaging and enjoyable
- 9 Imperial Mentors supported delivery in the GE² Tent during the festival weekend meaning there was a real life scientist in the tent at all times

Programme Delivery Overview

Workshop Structure

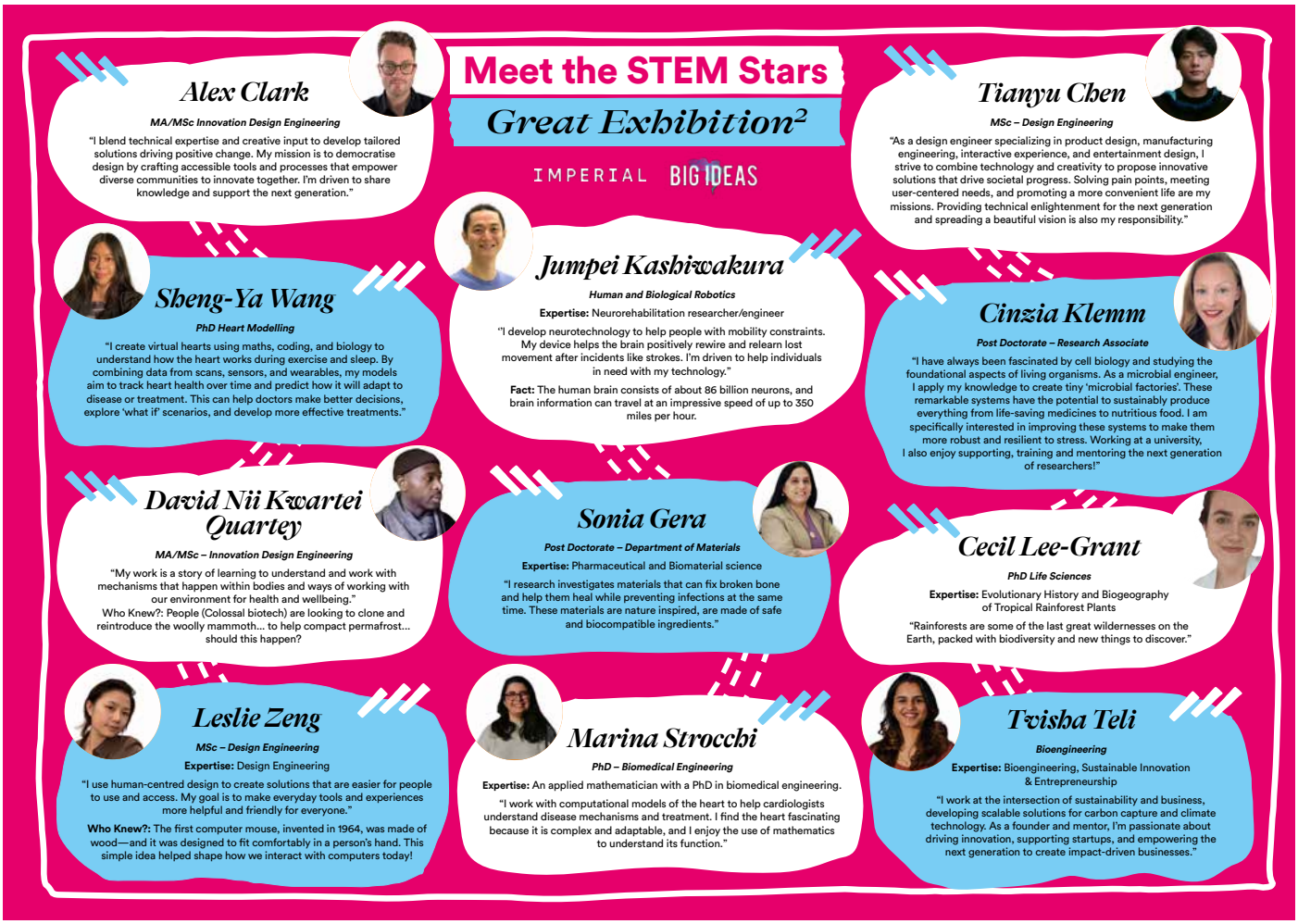
Each 90-minute school workshop was delivered by a Big Ideas facilitator and included:

1. **Past:** A presentation and quiz on the Great Exhibition of 1851.
2. **Present:** A talk co-designed by Big Ideas and delivered by an Imperial scientist or engineer centered on their research journey.
3. **Future:** An invention challenge, in small groups, prototyping a new device or innovation using craft materials and recyclables.

Mentor Engagement

Ten mentors were recruited in collaboration with Imperial, a mix of science researchers and design engineers. A series of training sessions led by our Big Ideas team prepared the Imperial mentors for classroom interaction. Mentors reported increased confidence and improved communication skills with young learners, all would recommend participation in the programme to their peers.

> "It has improved my overall confidence and desire to communicate my research further. I also believe that the outreach will support my professional career, specifically helping me to communicate the most important messages of my research to potential stakeholders or grant reviewers."
>
> Imperial Mentor



Teacher Engagement

Outreach targeted schools with the highest number of students eligible for FSM (Free School Meals), with workshops quickly filled in the selected boroughs. Teachers were once again acutely aware of students' needs but shared that they often lack confidence in science delivery. The presence of a working scientist added credibility and excitement to the workshops, the teachers reported.

"The workshop met my expectations. It was well-structured, interactive, and aligned with the curriculum. My students were engaged, and the activities helped reinforce key STEM concepts in an enjoyable way."

Class Teacher

Programme Outcomes

For Students

1. Young people who reported enjoyment of science increased from 72% at the start to 87% at the end of the workshop. An increase of 15%
2. Those who could imagine themselves as scientists or inventors rose from 46% to 83%
3. Students valued the creativity and freedom to "think big."
4. Students appreciated meeting an Imperial scientist in real life and felt special

For Teachers

1. Confidence in teaching science increased from 17% to 47%
2. 100% of teachers said the workshop exceeded expectations
3. Many intend to use the GE² model again in future planning

"Thank you for organising this workshop! It was a valuable experience for my students and provided great discussion points for future lessons."

Class Teacher

For Mentors

1. Mentors reported improved skills in group facilitation, creativity, and communication
2. Many mentors expressed an interest in further public engagement with students and teachers in underserved schools
3. Many Mentors communicated appreciation for the engagement skills demonstrated and support delivered by the Big Ideas facilitators in the classrooms
4. Before the workshops, 60% of mentors rated their youth engagement skills at 3 out of 5 or higher. Afterward, 77% expressed a newfound confidence, rating their skills at 4 or above, with a strong desire to continue developing their youth engagement abilities

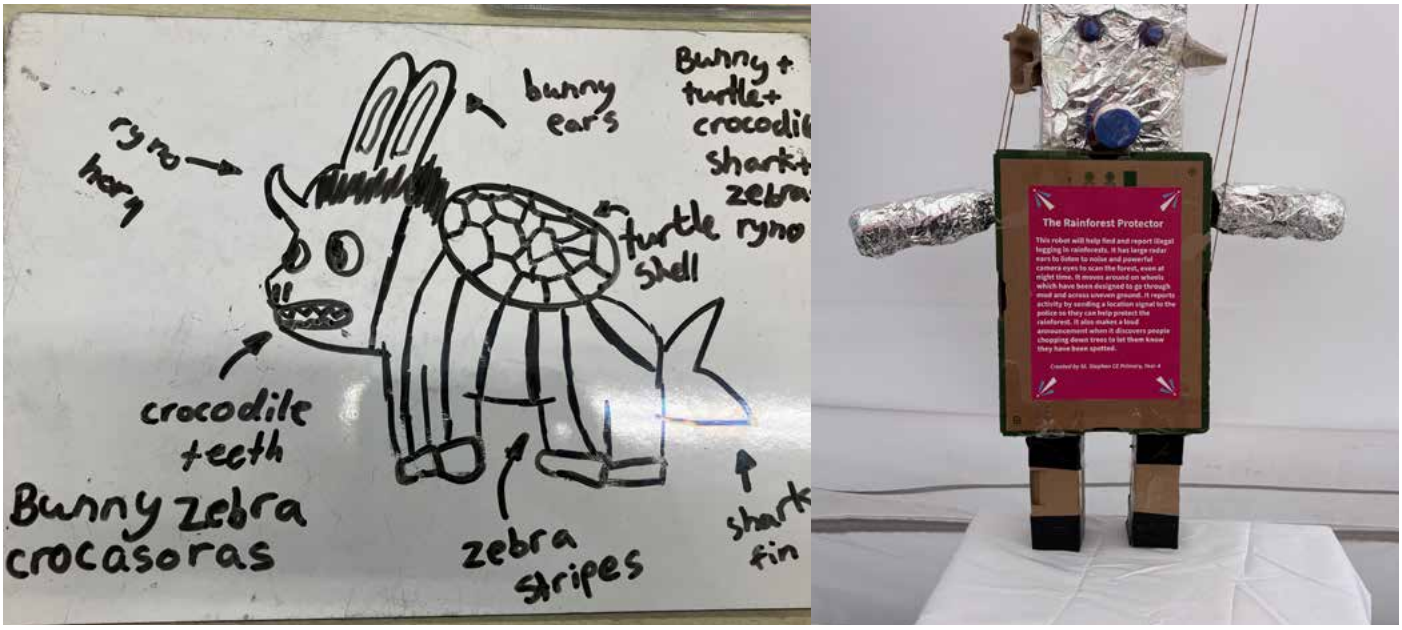
> "I think it is a very rewarding experience - I love seeing children engage in science and gain new skills. I also think it's very important to be able to communicate your research at a range of levels - including 8 year olds!"
>
> Imperial Mentor

Case study

St Stephens CE Primary School

This case study highlights the quality of thinking behind prototypes created during the Great Exhibition2 workshops and the children's engagement with the Imperial mentors' research.

Year 4 class at St Stephen Primary School had Imperial scientist Cecil Lee Grant in their classroom. Cecil shared her passion for biodiversity and protecting the world's rainforests. The students learned about how species evolve over time and had fun designing their own hybrid species.



Drawing of hybrid species (left) and The Rainforest Protector exhibited in GE2 Tent (right)

During the invention section of the workshop a robot prototype called 'The Rainforest Protector' was created by a small group of children. The quality of the thinking behind the idea and how it took direct inspiration from the visiting Imperial mentor is demonstrated in the children's description below:

> "This robot will help find and report illegal logging in rainforests. It has large radar ears to listen to noise and powerful camera eyes to scan the forest, even at night time. It moves around on wheels which have been designed to go through mud and across uneven ground. It reports activity by sending a location signal to the police so they can help protect the rainforest. It also makes a loud announcement when it discovers people chopping down trees to let them know they have been spotted."

Feedback from the class teacher emphasises the impact of taking part on her class:

> "The children are absolutely loving this. It's so rare that they get such creative freedom and a chance to test their own ideas. They'll remember today."
>
> Class Teacher

Festival Participation

At the Great Exhibition Road Festival (June of this year), the GE² Tent screened a film, produced by Big Ideas, that captured the students' in-class invention presentations. The tent also featured an invention table where children and adults of all ages used colourful plasticine to build original prototypes, allowing all festival-goers to join in the creative process.

- Over 3,700 people visited the GE2 Tent over the festival weekend
- Families, children, and community members came together and engaged with the activity.
- Most of the Imperial mentors from the school workshops volunteered to join us again at the festival, often staying hours longer than their initial commitment, to create with the participants and answer questions about their current research. Students who participated in the classroom programme were especially delighted when they recognised their Imperial mentor from the in-school program
- 9 young people who took part in the workshops visited the GE2 tent with their parents over the weekend and spotted themselves in the film

The invention table in the GE2 Tent

"Loved that my children used their own ideas to make what they wanted. Fantastic to meet a real scientist too!"

Festival attendee

Parents/carers and children create plasticine inventions to display in the Great Exhibition2 Tent

"I loved today. I enjoyed talking to the children and hearing their ideas."

Imperial Mentor on tent experience

Delivery Against KPIs

Key Performance Indicator	Target	Outcome
Schools engaged	20	19*
Pupils reached	600	552
Workshops delivered	20	20
Mentors involved	10	11
Festival prototypes shared in film	18	114
Tent visitors	3,000+	3700

*a secondary school had to drop out the day before the workshop was scheduled to take place so one school received 2 workshops to different age groups.

Recommendations

- **Maintain the in-person delivery model**, as this was strongly valued by teachers and more impactful for pupils.
- **Maintain the link to British Science Week in March**, as teachers plan activities to align and the offer to schools is strengthened.
- **Retain the plasticine invention table** but with increased capacity, as this was a major draw for family visitors at the festival.
- **Prioritise mentor diversity** to challenge stereotypes and increase student relatability.
- **Expand mentor roles at the Festival** with some structured presentations/sharing of work so more pupils meet real scientists and engineers.
- **Explore expanding programme to more schools**, opportunity to expand tried and tested engagement model to more schools to increase participation.

Conclusion

The Great Exhibition² this year celebrated young people's imagination, critical thinking, and creativity through the lens of science and engineering. Through close collaboration between schools, Imperial mentors and Big Ideas, the programme connects young people to the legacy of the Great Exhibition of 1851 while inspiring future innovators.

Big Ideas extends sincere thanks to Imperial, to all participating schools, mentors, and festival partners who made this year's GE² a success.

Children exhibit their prototypes in their class during GE2 workshop

Find out more www.big-ideas.org

Appendix A

Schools that Participated in 2025

School name	Class group
Fulham Cross Girls School | London, SW6 6BP	Year 7
St Francis of Assisi Primary School | Treadgold Street, W11 4BJ	Year 5
Westminster Academy | Sir Naim Dangoor Centre, 255 Harrow Road, W2 5EZ	Year 7
Colville Primary School | Lonsdale Rd, W11 2DF	Year 6
Burdett Coutts & Townshend Foundation C of E Primary School | Rochester St, SW1P 2QQ	Year 6
St Barnabas & St Philip's Church of England Primary School | 58 Pembroke Mews, Earls Ct Rd, W8 6EJ	Year 5
St Gabriel's Primary CoE | Churchill Gardens, SW1V 3AG	Year 3
Melcombe Primary School | Fulham Palace Road, W6 9ER	Year 5
Servite Roman Catholic Primary School | 252 Fulham Road, SW10 9NA	Year 4
Chelsea Academy | Lots Road, SW10 0AB	Year 4
King Solomon Academy | Penfold street, NW1 6RX	Year 7
The St Marylebone CE School | 64 Marylebone High Street, W1U 5BA	Year 7
St Joseph's Catholic Primary School | Lanark Road, W9 1DF	Year 7
St Augustine's CE Primary School | Kilburn Park Rd, NW6 5XA	Year 6
Barrow Hill Junior School | Bridgeman Street, NW8 7AL	Year 5
St Edward's Primary School | Lesson Grove, NW1 6LH	Year 4
St Peter's Church of England Primary School | 33 St Peter's Rd, W6 9BA	Year 5
St Clement & St James | Penzance Place, W11 4PG	Year 4
St Stephens CE Primary School | Uxbridge Road, W12 8LH	Year 4

Appendix B

First News article, content created by Big Ideas

10 by Charlie Baker

Special Report

Issue 989 FirstNews
30 May – 5 June 2025

INCREDIBLE INVENTIONS!

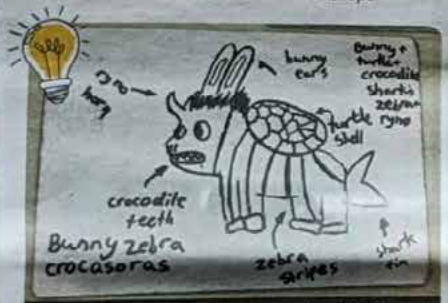
Science sparks your school creations

PUPILS have been getting inventive for the Great Exhibition Road Festival. The free festival was thought up by Imperial College London and sees 50,000 people head to the home of some of the country's best museums for a close encounter with our future.

Pupils in London were given the chance to showcase their own future inventions for the Great Exhibition² programme. Here's what they came up with...

A solar-powered fish

During British Science Week (7-16 March 2025), ten Imperial scientists visited 19 schools to talk to pupils about their work and run invention workshops.



A futuristic animal creation by pupils at St Clement & St James CE Primary

Cecil Lee-Grant, a scientist at Imperial, is helping to study how tropical rainforest plants change over time, so that we can protect them better. This is known as evolutionary biology.

Lee-Grant says: "Rainforests are some of the last great wildernesses on the Earth, packed with biodiversity and new things to discover."

Servite pupils put their ideas into practice

Year 4 classes at **St Stephen's CE Primary School** and **St Clement & St James CE Primary School** learned how animals and plants change and adapt over time. Then, they created their own creatures!

Their cool inventions included a solar-powered fish that eats plastic. It can expand to eat as much plastic as it encounters in the ocean. Another group created a robot called The Rainforest Protector (below), which **they designed to help with Lee-Grant's important work.**

A pupil at St Stephen's said: "Our robot is called The Rainforest Protector. It will help find and report illegal logging [cutting down protected trees and selling them to make money]. It has large radar ears to listen to noise, and powerful camera eyes to scan the forest, even at night time. It moves around on wheels that have been designed to go through mud and across uneven ground. It reports activity by sending a location signal to the police so they can help protect the rainforest. It also makes a loud announcement when it discovers people chopping down trees, to let them know that they have been spotted and to scare them away."

A massage pencil

Another Year 4 class that took part in the Great Exhibition² project were from **Servite RC Primary School**. The young people met Jumpei Kashiwakura, an Imperial engineer who is working on human and biological robotics.

The class came up with some original inventions, from a pencil that can massage your hand (above), to a robot called LICE that signs British Science Language.

The Massage Pencil was created to solve the problem of having to write so much that your hand hurts. The clever pencil has a hand massager on the top that children can use when they want to make their hand feel better.

One pupil said: "This pencil can write and, at the same time, makes sure your hand doesn't hurt. Squeeze all you want!"

The Great Exhibition Road Festival runs from 7-8 June 2025, and all events are free. You can find out more at www.exrdfestival.com.

Tens of thousands of people will take part in activities on a transformed Exhibition Road

Pupils at St Stephen's Primary show off their inventions, including The Rainforest Protector robot (centre)

DID YOU KNOW?

IN 1851, the Great Exhibition of the Works of Industry of all Nations was drawn up by Prince Albert (husband of Queen Victoria). It attracted six million people to Hyde Park in London. It was so popular that a cultural district, known as Albertopolis, was built in South Kensington. This is where you'll find Exhibition Road, along with famous museums like the Natural History Museum and Science Museum.