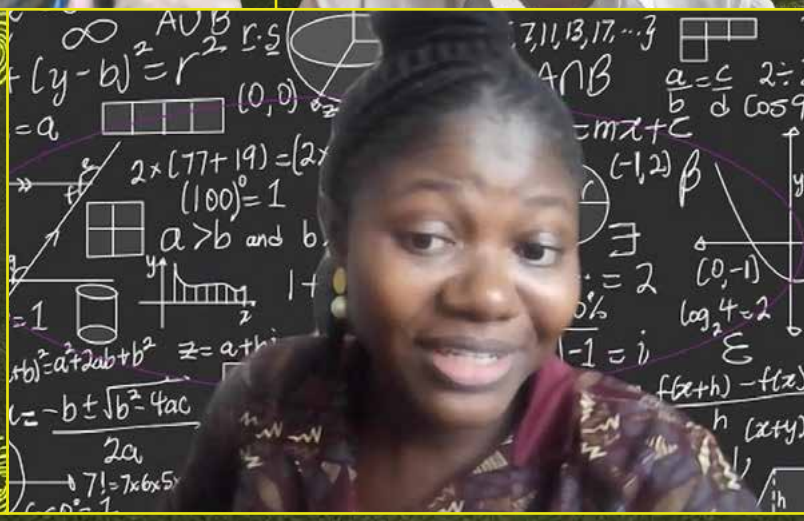
BLACK HEROES OF MATHEMATICS Youth Festival

Impact Report

Big Ideas | October 2025







The Black Heroes of Mathematics Youth Festival is funded by the Royal Commission of 1851 and held in association with the Black Heroes of Mathematics Conference, chaired by Professor Nira Chamberlain. With thanks to the conference partners – London Mathematical Society, Institute of Mathematics and its Applications and the International Centre for Mathematical Sciences.

BIG IDEAS

ROYAL COMMISSION EXHIBITION OF 1851

Introduction

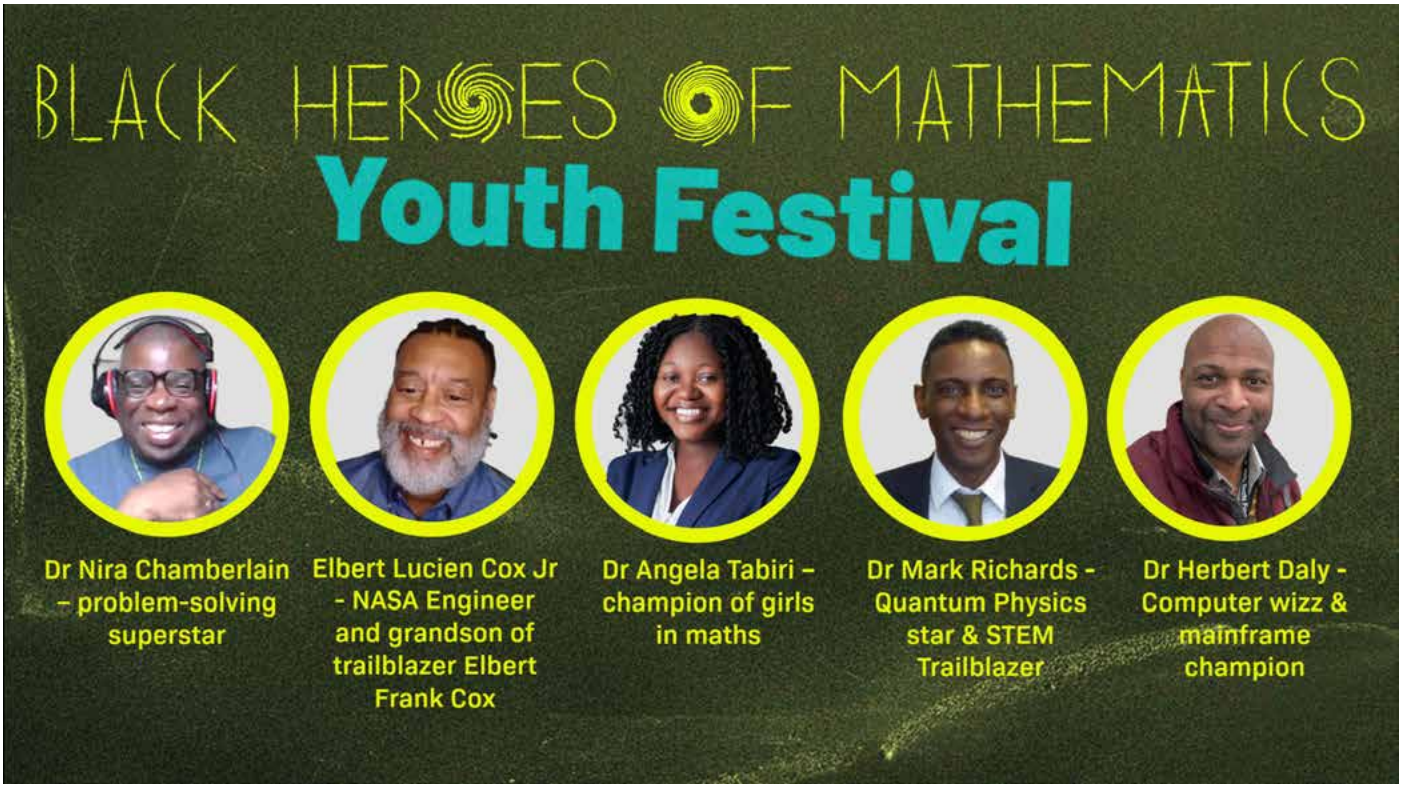
The Black Heroes of Mathematics Youth Festival 2025 offered a national platform to examine mathematics as both a rigorous intellectual pursuit and a human story shaped by diversity, perseverance and creativity.

The Black Heroes of Mathematics Youth Festival was funded by the Royal Commission of 1851 and held in association with the Black Heroes of Mathematics Conference, chaired by Professor Nira Chamberlain.

Delivered by Big Ideas, the free, live, online youth festival ran on 1st and 2nd October 2025 in tandem with the Conference and drew speakers from their cohort of mathematicians. The youth festival built on the conference's celebratory ethos and was produced in partnership with conference chair Professor Nira Chamberlain.

The Black Heroes of Mathematics Youth Festival brought engaging diverse role models and world class mathematicians directly into classrooms across the UK to mark Black History Month. Designed for pupils aged 7–14, the Festival introduced young people to the stories and achievements of Black mathematicians past and present, showing that mathematics is creative, relevant, and open to everyone.

With thanks to the conference partners – London Mathematical Society, Institute of Mathematics and its Applications and the International Centre for Mathematical Sciences and Professor Nira Chamberlain.



Festival at a Glance

42,382 pupils participated

231 unique schools joined across the UK

4 live sessions delivered over 2 days

Ages: 7–14 (Upper Primary and Lower Secondary)

100% would be interested in attending next year

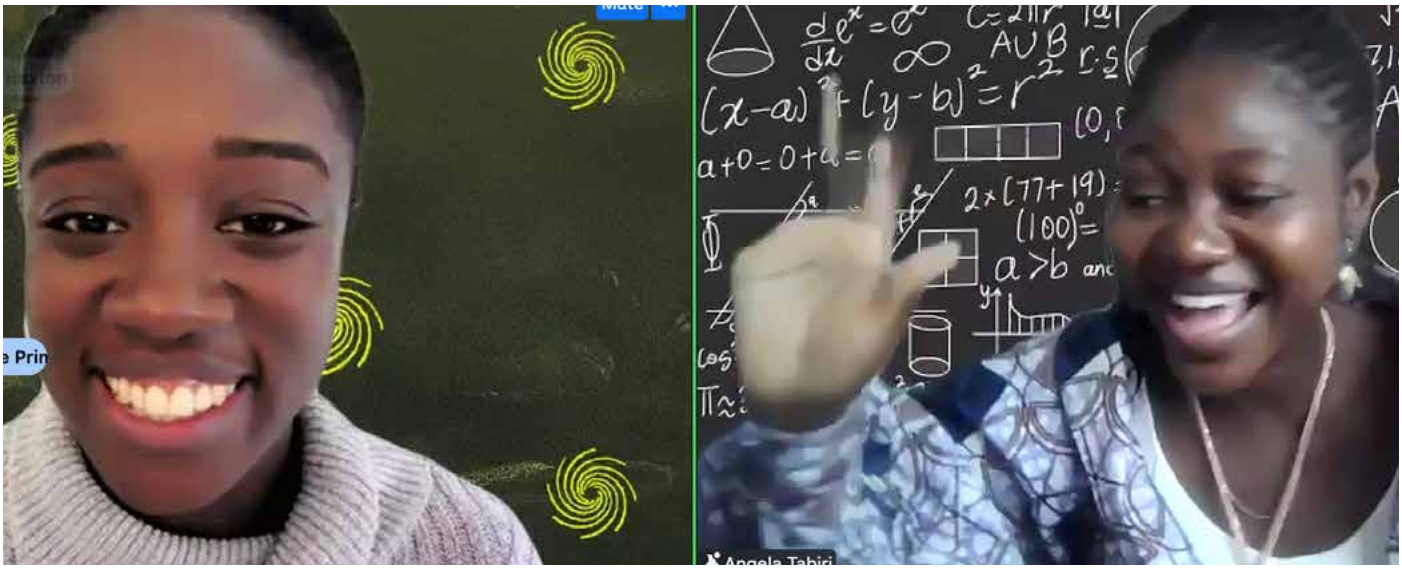
95% of teachers had told someone about the Festival

95% of teachers thought the Festival challenged stereotypes

80% observed an increased enthusiasm in maths

100% of teachers said their class had learned something new

80% of teachers agreed strongly or very strongly that their pupils enjoyed the Festival workshops



"We are all making a bit of history today!"
Professor Nira Chamberlain

Festival Aims

Inspire young people to see themselves in mathematics

Celebrate the achievements of Black mathematicians

Build confidence in mathematics through creative engagement

Connect maths learning to real-world careers

Support teachers with accessible, inclusive enriching content

The Festival aligns with national education priorities:

- **Raising attainment** and confidence in mathematics
- **Promoting diversity** and inclusion in STEM
- **Linking learning** to real-world careers and identities

By partnering with the Black Heroes of Mathematics Conference, the Youth Festival was designed to extend academic excellence and representation into classrooms nationwide.

Festival Programme Highlights

Across four carefully designed sessions, the Festival workshop invited pupils to experience mathematics as a creative, questioning, and inclusive discipline.

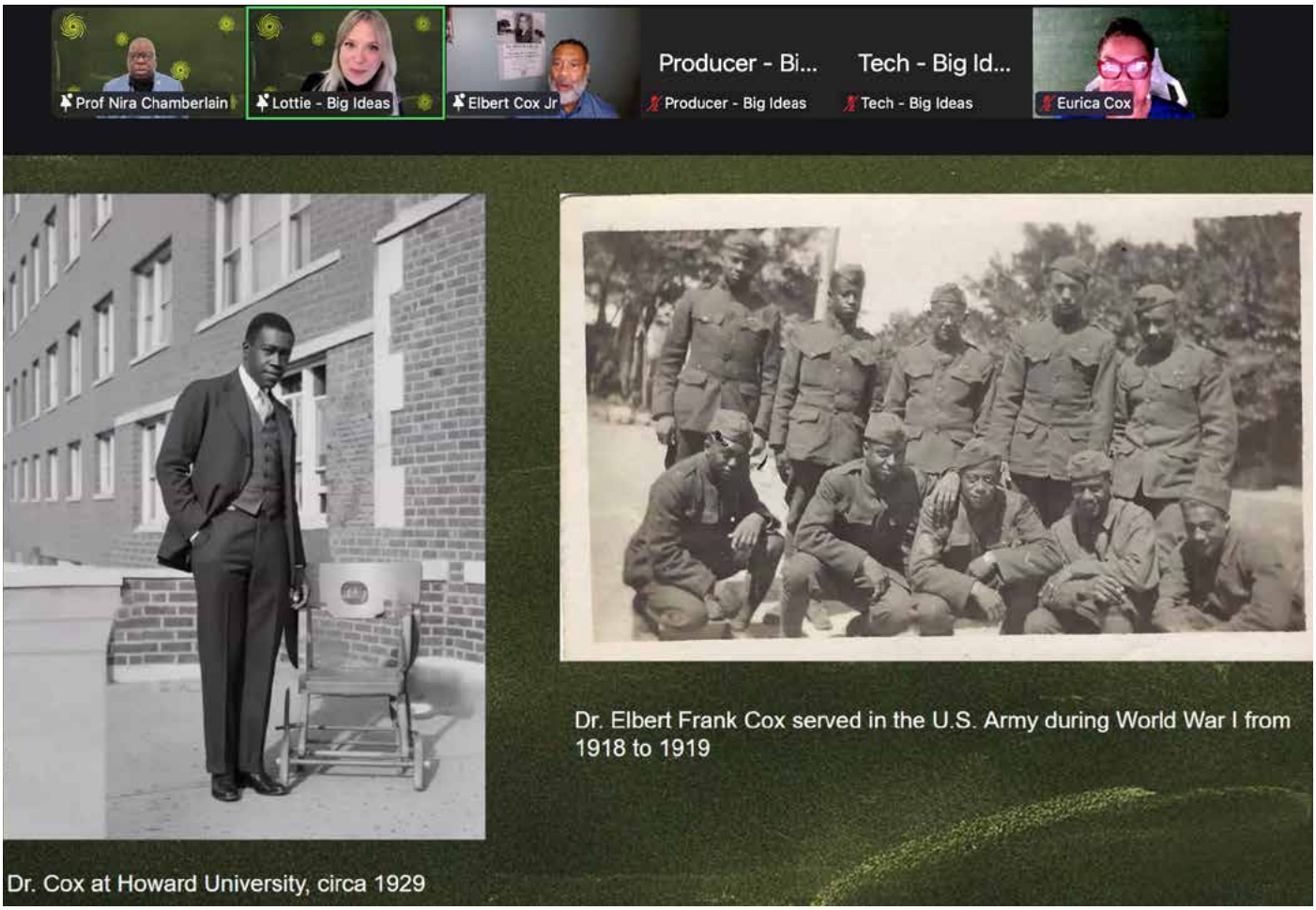
Each session combined storytelling, live interaction, and hands-on exploration to reveal the subject's breadth, from abstract ideas and historical legacies to practical applications and philosophical questions.

Pupils met inspiring role models, engaged with challenging concepts, and discovered that mathematics is not only a tool for understanding the world but a space for imagination and curiosity where everyone can be valued.

> **"They were in awe of getting to speak to the mathematicians."**
> Teacher Feedback

Session 1 – Elbert Cox100 (upper primary and lower secondary)

Led by Professor Nira Chamberlain, this session celebrated the centenary of Elbert Frank Cox, who was the first Black person to be awarded a PhD in mathematics. Students met his grandson, Elbert Lucien Cox Jr, a senior NASA engineer, and played a unique interactive Elbert Cox Game, discovering mathematical patterns in base 2. They learned that persistence, curiosity, and creativity define a mathematician's journey.



The Black Heroes of Mathematics Conference was marking the 100th anniversary of the Elbert Frank Cox's Mathematics PhD from Cornell University. Cox is celebrated as the first Black person to be awarded a Maths PhD anywhere in the world. The Youth Festival was joinedby Cox's grandson, charismatic NASA Engineer Elbert Lucien Cox Jr.

"A mathematician isn't someone who finds maths easy. A mathematician is someone who finds a problem and never ever quits."

Professor Nira Chamberlain

"When you are growing up and come up with an idea for what you want to do, don't let anybody stop you."

Elbert Lucien Cox Jr

"Thank you for sharing your time with us, we will be playing the Elbert Cox game again!"

Teacher Feedback

"All interested, all wanted to know more about STEM careers. One child went and completed his own research about Elbert Cox."

Teacher Feedback

> I have been organizing the Black Heroes of Mathematics Conference for the last 5 years and there have always been requests that we should expand the audience - but at the expense of the maths. This year was a special year as we were celebrating 100 years of the first Black person to get a PhD in Mathematics, Elbert Frank Cox. The Big Ideas Team offered to extend the conference to schools while keeping maths front and centre. They defined their event as a Youth Festival and generated a logo for the entire conference. The collaboration pushed both parties outside their respected comfort zone, in my case, I had to find a way to explain a 100-year-old maths PhD to a group of 7 years olds! The end result was pure magic and technically excellent. But to top it off, Big Ideas found Elbert Frank Cox's grandson – NASA engineer Elbert Lucien Cox Jr – and invited him to take part in the Youth Festival. Big Ideas are definitely one of my favourite organisations I have ever worked with.
>
> Professor Nira Chamberlain

Professor Nira Chamberlain at the London Mathematical Society HQ in London prepares for the first Youth Festival workshop.

Session 2 – Maths is Magic (primary only)

Expert guest Dr Angela Tabiri, who currently holds the title of "The World's Most Interesting Mathematician" , joined the event from the African Institute of Mathematical Sciences [AIMS] in Ghana.

Dr Tabiri is a quantum mathematician and shared her interest in quantum maths through non-commutative properties. She challenged pupils to complete a magic square and reflected on maths as a universal language with cultural responses, such as Ghanian Kente Cloth.

Dr Tabiri drew an enormous audience of more than 16,000 registrations, a record for Big Ideas digital events.

“Maths is life — everything around us is maths.”

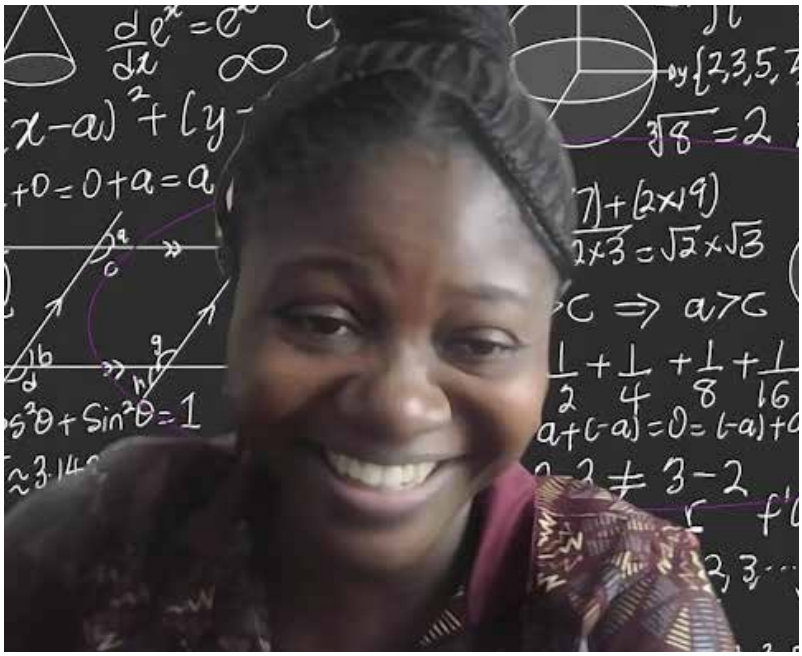
Dr Angela Tabiri

“Great excitement and buzz about maths. (The best thing was) Angela Tabiri!”

Teacher Feedback

“They keep making magic squares!”

Teacher Feedback



“It got them asking lots of questions about maths.”

Teacher Feedback

“My previous experience of online workshops in Ghana involved up to 20 students so it was exciting to be speaking to 16,000 primary students at the Black Heroes of Mathematics Youth Festival. I’m a passionate advocate for girls in STEM so this was a fabulous platform to be there as a role model as well as introducing thousands of young minds to quantum maths. I felt ecstatic when the questions came streaming in … I’d love to be part of the youth festival again next year!

Dr Angela Tabiri

Session 3 – Infinity Wars: maths or physics (secondary only)

Dr Mark Richards and Professor Nira Chamberlain were challenged to fight for the support of the audience in an event which playfully pitted maths and physics against each other.

Through live polls and word clouds, students explored the different approaches maths and physics can take to the same topic. For example, with Physics deploying mechanics to analyse the trajectory of a football, or the Monte Carlo simulation to estimate the fate of Aston Villa.

Dr Richards, aka DJ Kemist, also shared a reggae remix of Wonder Wall to demonstrate the physicist’s view of music while Prof Chamberlain countered with the maths of harmony.

Within the wider conversation Infinity Wars also probed the differences between the two disciplines and celebrated their synergies. And the Infinity Wars outcome…? Maths won the pupil vote at the end of the session!

During Infinity Wars two topics were explored through the lenses of maths and physics, including music presented by Dr Mark Richards aka DJ Kemist. This screengrab gives a snapshot of the busy chat function while classes listened to Dr Richards' commentary on his reggae remix of Wonder Wall.

"I became a physicist because I was asking 'why' too many times! If you are someone with an inquisitive mind, you are someone who would like physics."

Dr Mark Richards

"Thank you very much for delivering this session. It was informative and engaging. Keep up the good work and we look forward to the next session in 2026."

Teacher Feedback

"They enjoyed it, as it was an immersive experience and something different to standard lessons."

Teacher Feedback

"

The Black Heroes of Mathematics event was really enjoyable. Although online, it was clear that students were engaged and well-informed given the great set of interactive answers and comments submitted. By the end students gained a much deeper appreciation for music or sport through the lens of maths and physics.

Dr Mark Richards

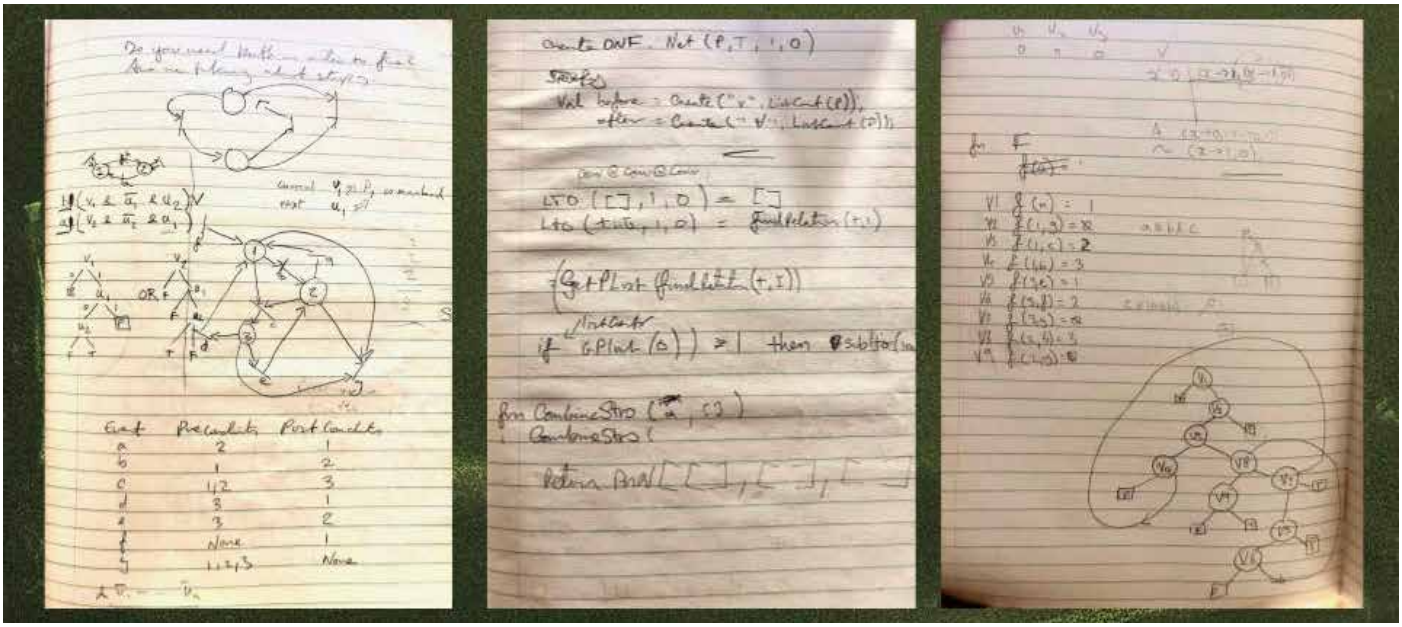
Session 4 – Will My Computer Survive Without Maths? (upper primary and lower secondary)

The final workshop with Dr Herb Daly explored applied maths in the context of computer science. The workshop explored what was inside a computer starting with the hardware and moving on to the hidden mathematics that powers modern computing and has since Charles Babbage - the zeros and ones of binary code.

Through interactive puzzles and challenges, they saw that every digital device depends on mathematical thinking and problem-solving.

> **"Although I live and breathe computers, I do maths in my head and with a pen and paper every day."**
>
> Dr Herb Daly

> **"Fantastic presentation once again. What a joy."**
>
> Teacher Feedback



Herb Daly (Herb's handwritten maths notebooks)

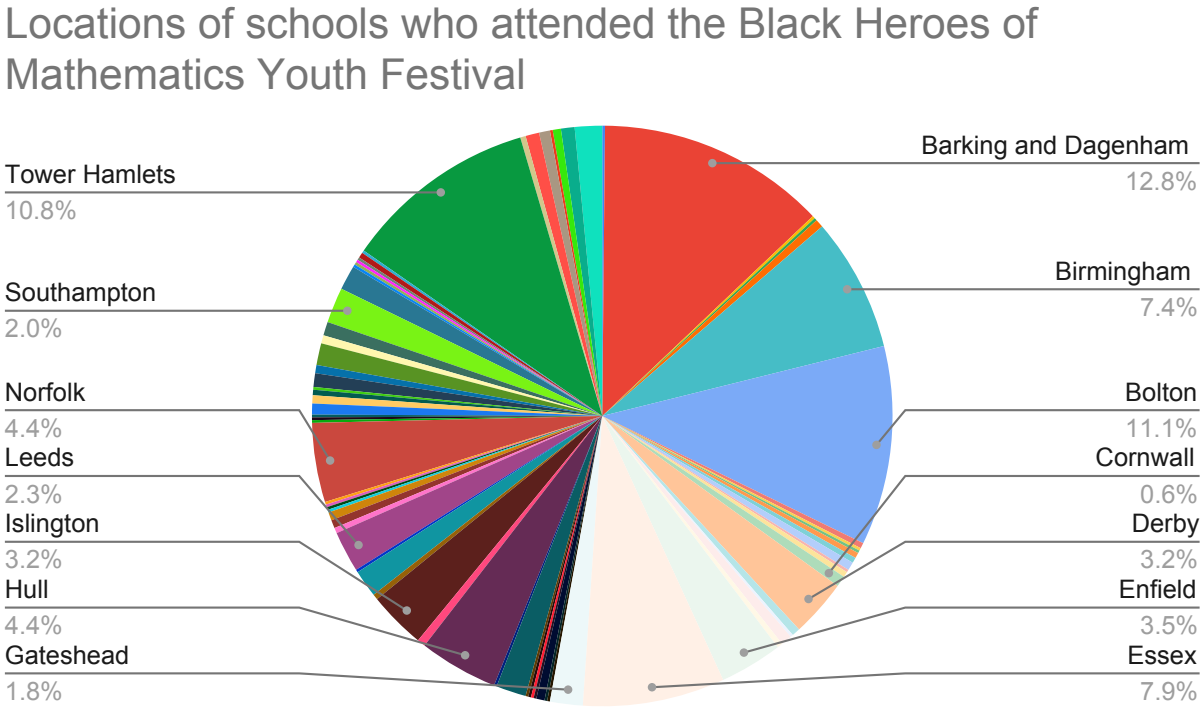
> It was really great to engage with school age children and to have all their questions coming in thick and fast. There aren't many opportunities specifically aimed at Black mathematicians, so it was a great honour to be asked to take part.
>
> I enjoy talking about maths in practical ways that people can relate to. I hope some of those who took part may be inspired to learn more about maths and computer science, especially about mainframes."
>
> Dr Herb Daly

Dr Herb Daly attending the Black Heroes of Mathematics Conference, the London Mathematical Society gardens.

Festival Delivery

A UK wide Festival

Participants joined the Festival live across the UK, with thousands of classrooms taking part simultaneously via interactive platforms. Teachers were able to engage without special preparation or equipment needed, making sure the event was accessible to all schools.



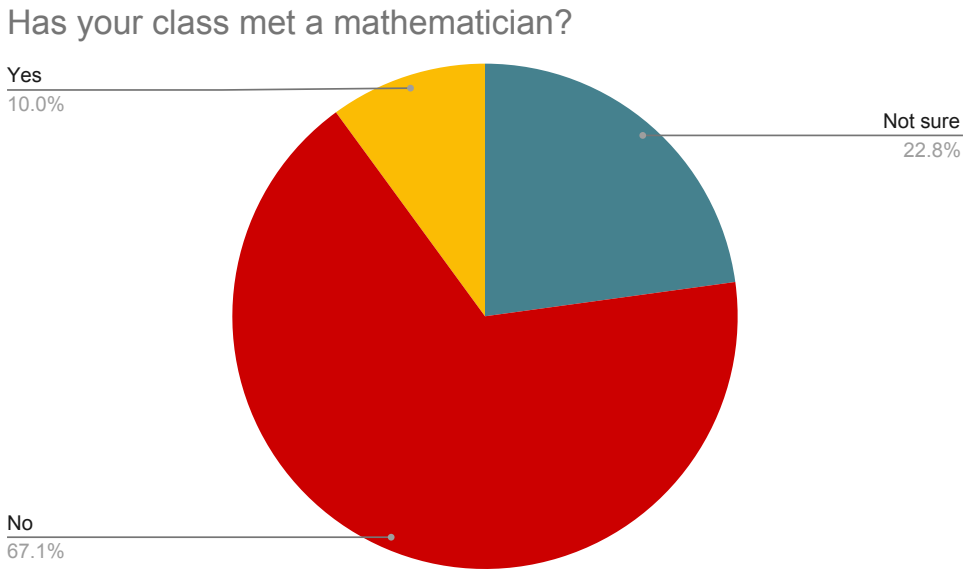
*Above, an absolute rainbow of students from councils across the UK joined us

Live polls, Menti word clouds, and games ensured pupils were active participants. In the spirit of Black History Month, many discovered new role models. In particular PhD trailblazer Elbert Frank Cox, and living mathematicians including expert guests Professor Nira Chamberlain, Dr Herb Daly, Dr Mark Richards, Elbert Lucien Cox and Dr Angela Tabiri.

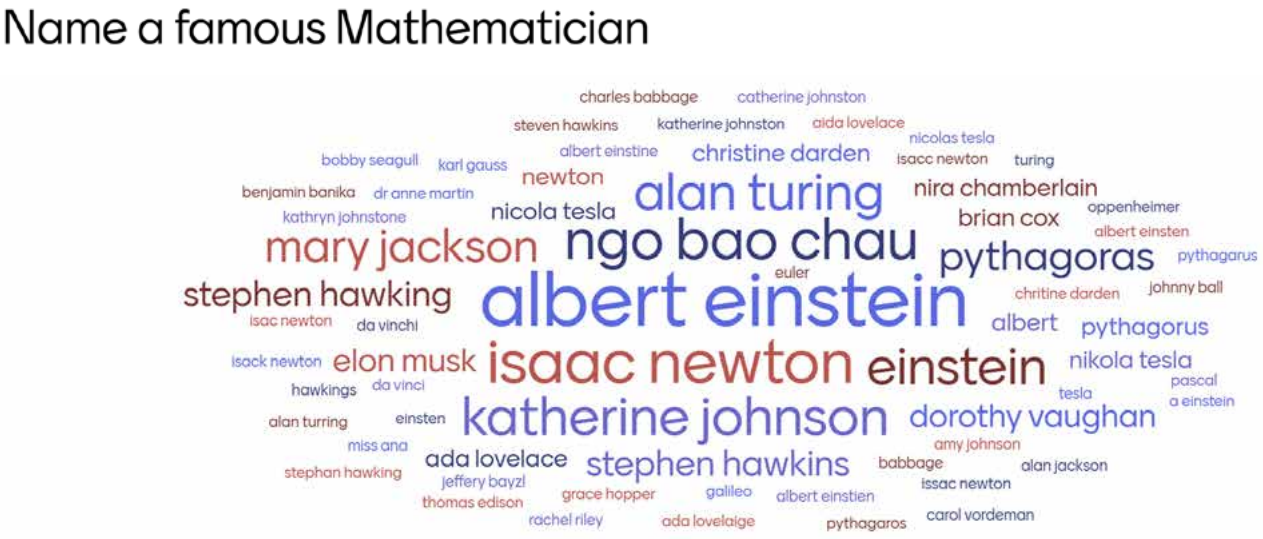
> **"Relatable, aspirational figures for our black pupils and increased enthusiasm about maths for all."**
>
> Teacher Feedback

Opportunity to meet a mathematician for the first time

Before the workshop, teachers were asked if their students had ever met a Mathematician and only 10% believed they had. This means that for the majority of participants this was their first time meeting working mathematicians.



The most popular mathematician they had heard of or learned about was Einstein. Most students had also never learned about or heard of any Black mathematicians - when asked, 80% of teachers said they had not, or were not sure if they had, discussed Black Mathematicians with their class.



"We have a high number of Black pupils and this event raised the profile of Black mathematicians."

Teacher feedback

Applied and experienced

Each session of the Festival blended storytelling with interactive, hands-on exploration, helping pupils experience mathematics as something active, creative, and enjoyable. From uncovering hidden number patterns in the Elbert Cox Game, to constructing magic squares with Dr Angela Tabiri and decoding binary messages with Dr Herb Daly, pupils were invited to think, question, and play like mathematicians.

These activities demonstrated that mathematics is not confined to textbooks but is a living subject that rewards curiosity, collaboration, and perseverance. Teachers praised the balance of information and engagement, noting how the sessions captured pupils' attention and made abstract concepts feel tangible and exciting.

Each workshop offered classes an opportunity to ask the expert guest questions ensuring that mathematical role models are relatable and approachable.

Festival Impact

Representation and Belonging

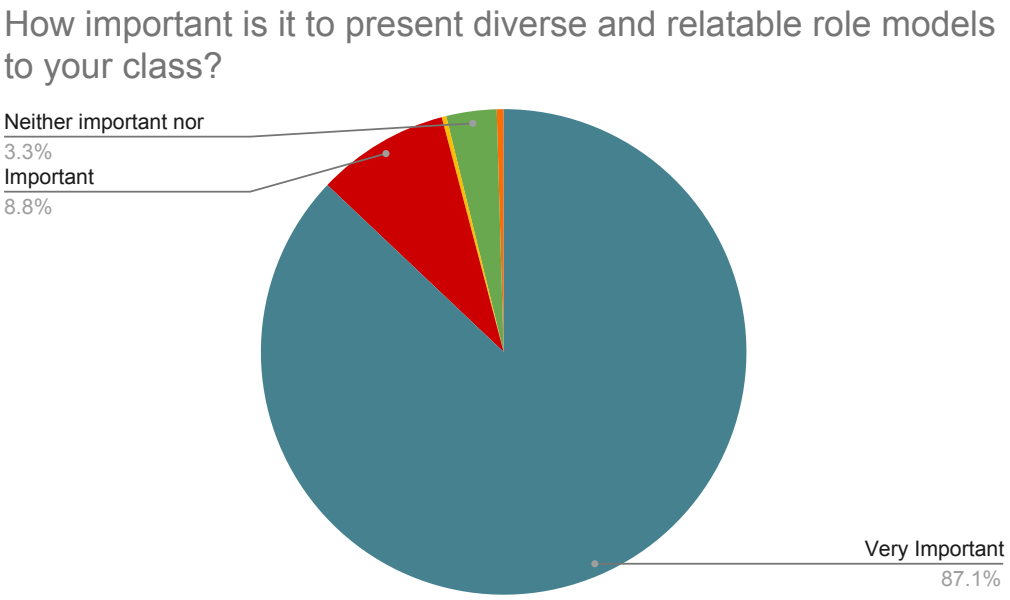
The Festival spotlighted mathematicians from Ghana, the UK, and the USA, reflecting a global story of excellence and inclusion. Students engaged directly with expert guests helping to challenge stereotypes and broaden aspirations for everyone.

"Have you, Elbert or Nira, ever been treated differently because you are black?"

Elsie at Hillhouse CE Primary School

"How did his family react when your Grandfather got his PhD?"

Mia at Woodthorne Primary School Year 5



*When teachers were asked during session registration whether it was important to them for students to be presented with diverse and relatable role models, 86% responded it was very important.

The importance of representation applies in all contexts as evidenced by the UK wide registrations with high numbers of registrations across the board from Barking and Dagenham to Norfolk, Bolton to Essex.

"As home educated children in a very rural area access to workshops and festivals such as these are very sparse, the children talked very enthusiastically to their family and friends about all of the sessions."

Homeschooling Parent

After the Festival, teachers overwhelmingly reported that the festival has challenged stereotypes in their classrooms - 9 out of 10 teachers said this was the case. This demonstrates the immediate impact events like these can have on young people's perceptions of who can be a mathematician.

"It introduced them to the concept that anyone can be a mathematician and was a starting point to a project on mathematicians of the past"

Teacher Feedback

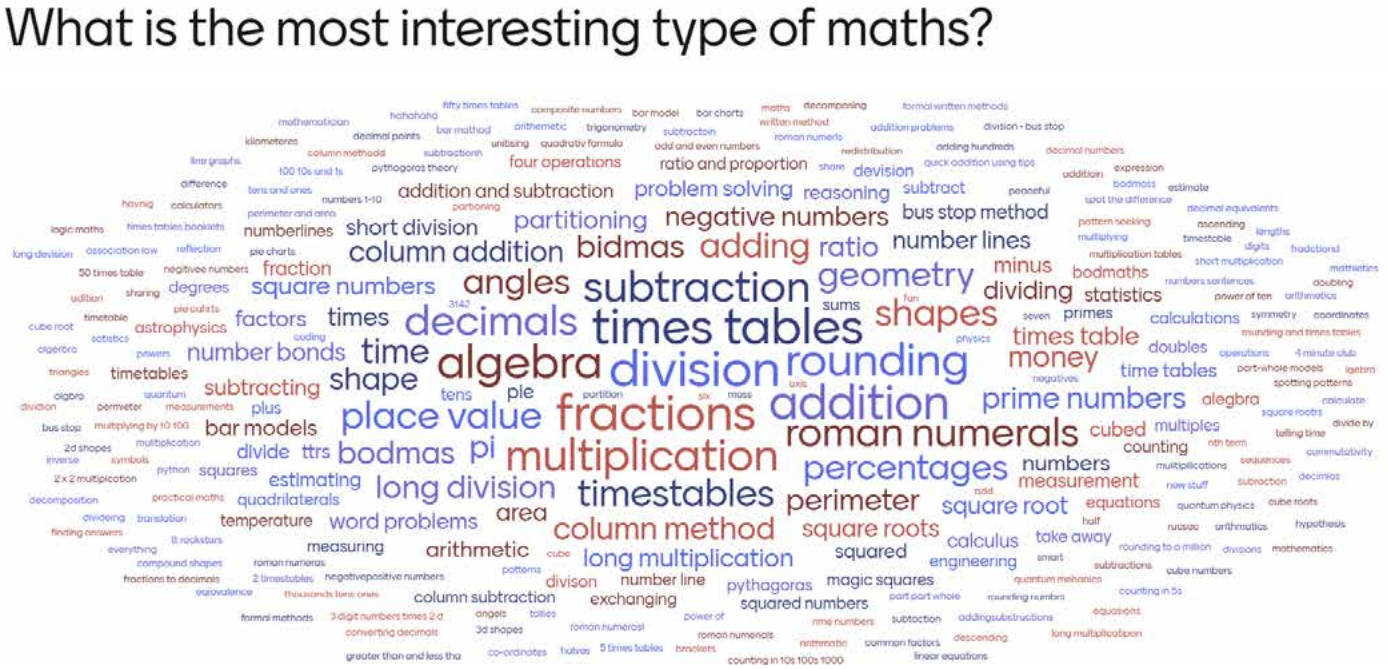
"They were surprised to hear that an 'African woman' was a Quantum Mathematician, due to their stereotypical views of Africa."

Teacher Feedback

Increase in Maths Confidence and Engagement

Interactive challenges and storytelling helped pupils see themselves as active problem-solvers, rather than passive learners, highlighting that mathematics is a process of exploration and persistence rather than instant certainty. This in turn increases young people's enthusiasm for maths, as reported by 83% of teachers.

Through guided discovery, creative tasks, and real-time collaboration, students experienced how perseverance and curiosity drive mathematical thinking, and how confidence grows not from getting the right answer first, but from the willingness to keep asking questions and try again.



Awareness of Maths Careers Supported by Increased Teacher Confidence

Hearing from a NASA engineer, a computer scientist, and research mathematicians helped build students' awareness of maths-related careers, which is crucial to broadening participation and breaking stereotypes. After attending the workshop, **83% of teachers reported increased enthusiasm for maths among their pupils**, showing that career-focused interventions can directly boost engagement. Equally encouraging, **92% of teachers said the workshop challenged stereotypes about who can become a mathematician**, helping to foster a more inclusive perception of the subject. Furthermore, **83% of teachers felt more confident discussing maths careers**, suggesting that empowering educators to connect classroom learning with real-world opportunities can have a lasting impact on how young people view their future in mathematics.

> **"They were inspired by the realization that mathematics could lead them to interesting careers and fulfilling lives."**
>
> Teacher Feedback

Conclusion

The Black Heroes of Mathematics Youth Festival 2025 reached tens of thousands of pupils, transforming how they see mathematics and who maths belongs to. Through inspiring speakers, interactive games, and powerful stories, pupils learned that mathematics is not just about numbers, it's about people, ideas, and endless possibilities.

> **"When you get the result and solve a problem, it is the best feeling in the world."**
>
> Elbert Lucien Cox Jr

As far as we were aware, this was the first large scale shared experience of schools coming to celebrate diversity in maths and discover the people and careers behind the numbers. No national day or initiative currently exists with this purpose. The urgent demand for this type of intervention is evidenced by the large scale engagement by UK schools during the Festival's inaugural year.

Big Ideas thanks the Royal Commission of 1851, the Black Heroes of Mathematics Conference including the conference partners – London Mathematical Society, Institute of Mathematics and its Applications and the International Centre for Mathematical Sciences, the Conference founder Professor Nira Chamberlain, and expert guests Dr Mark Richards, Dr Angela Tabiri, Dr Herb Daly, Elbert Lucien Cox Jr as well as all participating schools for making this Festival an historic success.

Recommendations

To build on this success, Big Ideas recommends:

- Continuing the Festival annually each October to launch Black History Month
- Creating teacher resource packs with follow-up activities and role model profiles
- Expanding data collection to track long-term impact on confidence and aspirations
- Building further collaborations with mathematicians, universities, and STEM organisations.

Find out more www.big-ideas.org