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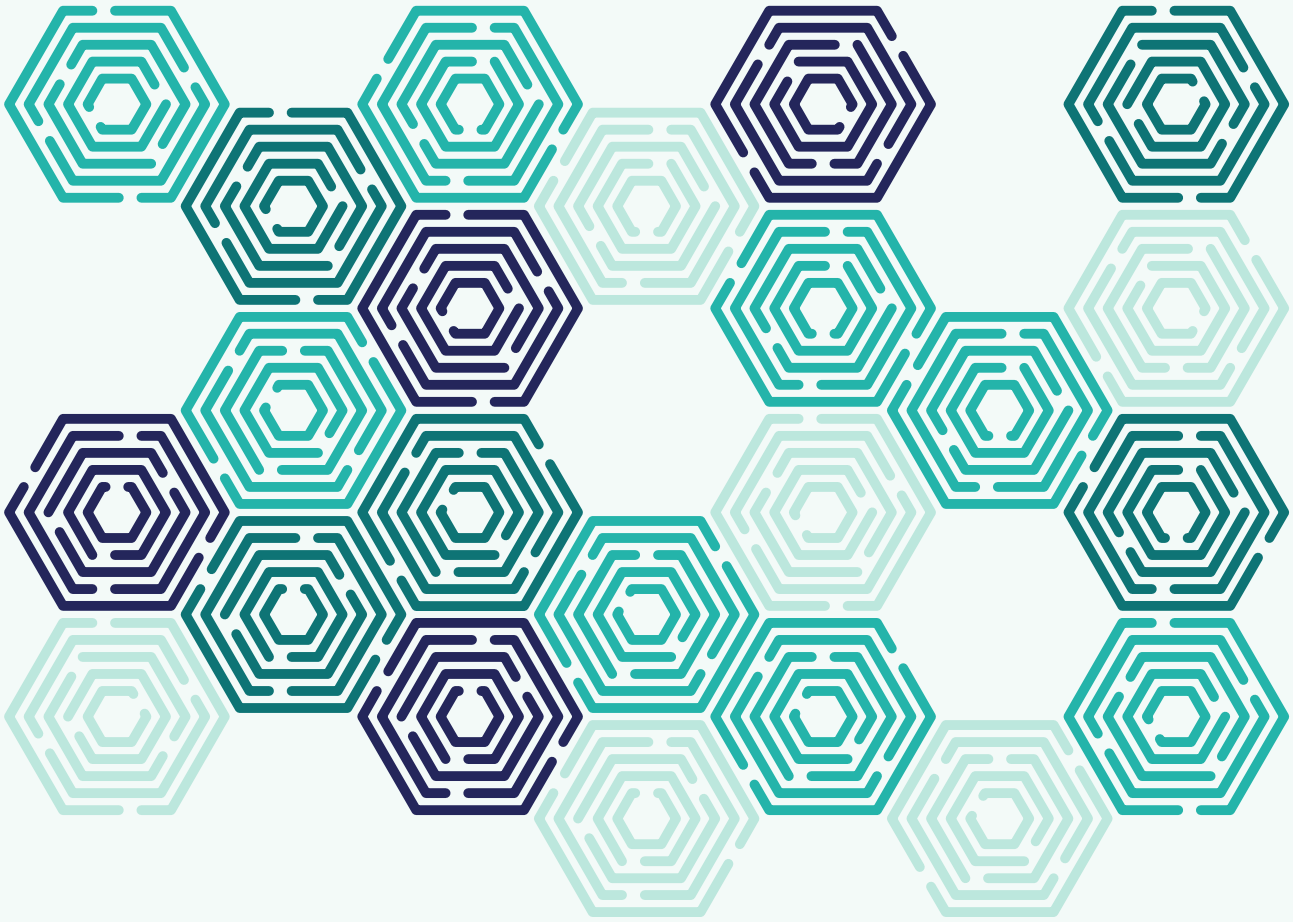

BIG BANG AT SCHOOL 2024/25: EVALUATION REPORT

Results from the evaluation of 2024/25 Big Bang at School

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Executive summary

Big Bang at School engaged **82,596 young people** from **251 schools** across the UK, with 87% of schools meeting EngineeringUK's priority school criteria.[1] Big Bang at School aimed to inspire and inform students about STEM careers through supporting and empowering schools to host a STEM event with hands-on STEM activities in their school.

This evaluation draws from:

- **student survey** responses from **3,727 students** across **59 schools**
- **teacher survey** responses from **153 teachers** across **145 schools**
- **teacher interviews** from **7 teachers** across **7 schools**

The student survey findings explore Big Bang at Schools' impact on students' enjoyment, knowledge, motivation, and interest of STEM careers. The survey also examined differences in experience across key demographic groups, including gender, ethnicity, Free School Meal eligibility, disability status, year group and prior STEM engagement. The teacher survey and interview findings explore teachers' experience of Big Bang at School, their views on students' experience, teachers' confidence and knowledge around STEM careers, and future STEM engagement plans.

Key Findings

Big Bang at School is a powerful tool for engaging young people in STEM, with evidence that it supports EngineeringUK's strategic mission to inspire the next generation of engineers and technicians and increase the diversity and number of young people choosing engineering and technology pathways.

Students

Big Bang at School performed well in the evaluation with young people, with positive responses to questions from all demographic groups.

Enjoyment

There were high levels of enjoyment, with **66%** of students **enjoying Big Bang at School**. There were no significant differences by gender or Free School Meal eligibility for enjoyment, and for the groups where there were significant differences, all students still responded positively to enjoying Big Bang at School.

STEM outcomes

Student survey findings suggest there was an impact on engineering, technology and science outcomes for students, with:

[1] EngineeringUK's priority school approach identifies schools with high proportions of students from underrepresented groups in engineering. The aim is to target programs and support to these schools to increase diversity in the engineering and technology workforce. For more detail, see https://www.tomorrowsengineers.org.uk/improving-practice/resources/engineeringuk-priority-schools-criteria/

- **64%** reporting **increased knowledge** on the different types of **things engineers do** in their jobs
- **66%** being **motivated** to find out more about one or more **engineering, technology and/or science jobs**
- **60%** reporting **increased interest** in one or more **engineering, technology and/or science jobs**
- **54%** feeling that one or more **engineering, technology and/or science jobs** was **suitable** for someone like them

Prior STEM engagement

While gaps were seen in prior STEM engagement, students with low prior STEM engagement responded positively across all outcome areas, suggesting Big Bang at School effectively reaches less engaged groups. This emphasises the importance of STEM outreach happening within schools, like Big Bang at School, to ensure wider participation.

Year group

Year 7 and year 8 students responded more positively to enjoyment, knowledge, motivation for engineering and technology, suitability and interest in technology jobs compared to older year groups. This is supported by the national level's (SET)[2] findings that students become less engaged with STEM as they get older and this may also be tied to the content of Big Bang at School sessions, as this tends to align with the curriculum for years 7 to 9.

Demographic differences

Overall, responses from girls were broadly positive about Big Bang at School. Gaps were seen in **gender** around motivation, interest and suitability for engineering and technology jobs, however, these differences were narrower than the national benchmarks.[2]

Responses from UK minority ethnic groups were positive about Big Bang at School. Again, gaps were seen in **ethnicity** around enjoyment, knowledge, motivation, suitability and interest for engineering jobs, with white students responding more positively to these outcomes. However, students from UK minority ethnic groups responded more positively to motivation and interest around science jobs.

Similarly, responses from **disabled students** were positive overall, even though they were less likely to report enjoyment, motivation to do more STEM activities, motivation to find out more about technology and science jobs, suitability for technology and science jobs, and interest in engineering, technology and science jobs.

Teachers

Similar to the student responses, Big Bang at School performed well in the evaluation with teachers. Interviewed and surveyed teachers reported positively on their **experience** of Big Bang at

[2] Science Education Tracker 2023 (Wave 3). EngineeringUK and The Royal Society. www.engineeringuk.com/set

School, and **student experience.** Particularly, interviewed teachers spoke to how events helped to **engage their students** and make them more **aware of STEM careers**, and surveyed teachers said Big Bang at School was **accessible**, had **links to the school curriculum**, and **highlighted a variety of careers in engineering and technology** to students.

Interviewed and surveyed teachers also responded positively around Big Bang at School improving their **knowledge** and **confidence** about **engineering and technology careers** and were more likely to **suggest** to a **student** they **consider a career in these areas**.

Looking to the future, almost all of the interviewed teachers are planning to take part in Big Bang at School next year. Similarly, nearly all surveyed teachers are more motivated to organise more STEM activities for their students, and many said Big Bang at School has given them resources they can use in future STEM activities, suggesting Big Bang at School has encouraged **continued STEM engagement** with these teachers.

Recommendations

- **build on momentum for less engaged students** (those with lower prior STEM engagement) by encouraging schools to continue to run Big Bang at School, providing follow-on activities and resources for teachers to continue to use in their role
- **explore disabled students' experiences further** and adapt evaluation tools to better capture these and ensure activities are inclusive and accessible
- **continue to improve on the good work around gender**, by providing schools with more support to tackle girls' motivations in STEM and continue developing content which has a bias towards engaging girls

Introduction

Big Bang at School aims to support and empower schools to host a STEM event that inspires students to consider a career in STEM by showcasing the diversity of STEM careers and engaging students with hands-on STEM activities.

82,596 young people from 251 schools took part in a Big Bang at School this year and 87% of these schools who took part met EngineeringUK's priority school criteria.[3]

Big Bang at School provides schools with the tools to organise a customised event within their own educational institutions at any time of year. All schools are provided with Blueprint resources, which provides educators with insights, content, guidance and connections to create their own Big Bang at School STEM event. A selection of schools across the UK are also provided with a delivery partner to provide additional support for schools to scope, design and deliver their event. This year:

- 129 schools (51%) received Blueprint resources to support them to run their event
- 122 schools (49%) received Blueprint resources and a delivery partner, specific to their region[4], to support them with running their event

As schools have flexibility when organising and running their event, we cannot say what is included in every event. However, EngineeringUK recommends that schools include the below in their event:

- hands-on practical content
- skills activities
- project-based learning
- careers engagement
- reflection opportunities

We used EngineeringUK's Impact Framework[5] to build a Theory of Change and identify short-term outcomes for Big Bang at School, which centre around the COM-B model:

- making sure young people enjoy themselves at the event to get their attention and engage them in meaningful activities
- building their **capabilities**, so young people feel that they have the skills to pursue a job in STEM and feel confident to do so
- presenting them with new **opportunities** to increase their knowledge of STEM jobs and what people working in STEM do

[3] EngineeringUK's priority school approach identifies schools with high proportions of students from underrepresented groups in engineering. The aim is to target programs and support to these schools to increase diversity in the engineering and technology workforce. For more detail, see https://www.tomorrowsengineers.org.uk/improving-practice/resources/engineeringuk-priority-schools-criteria/

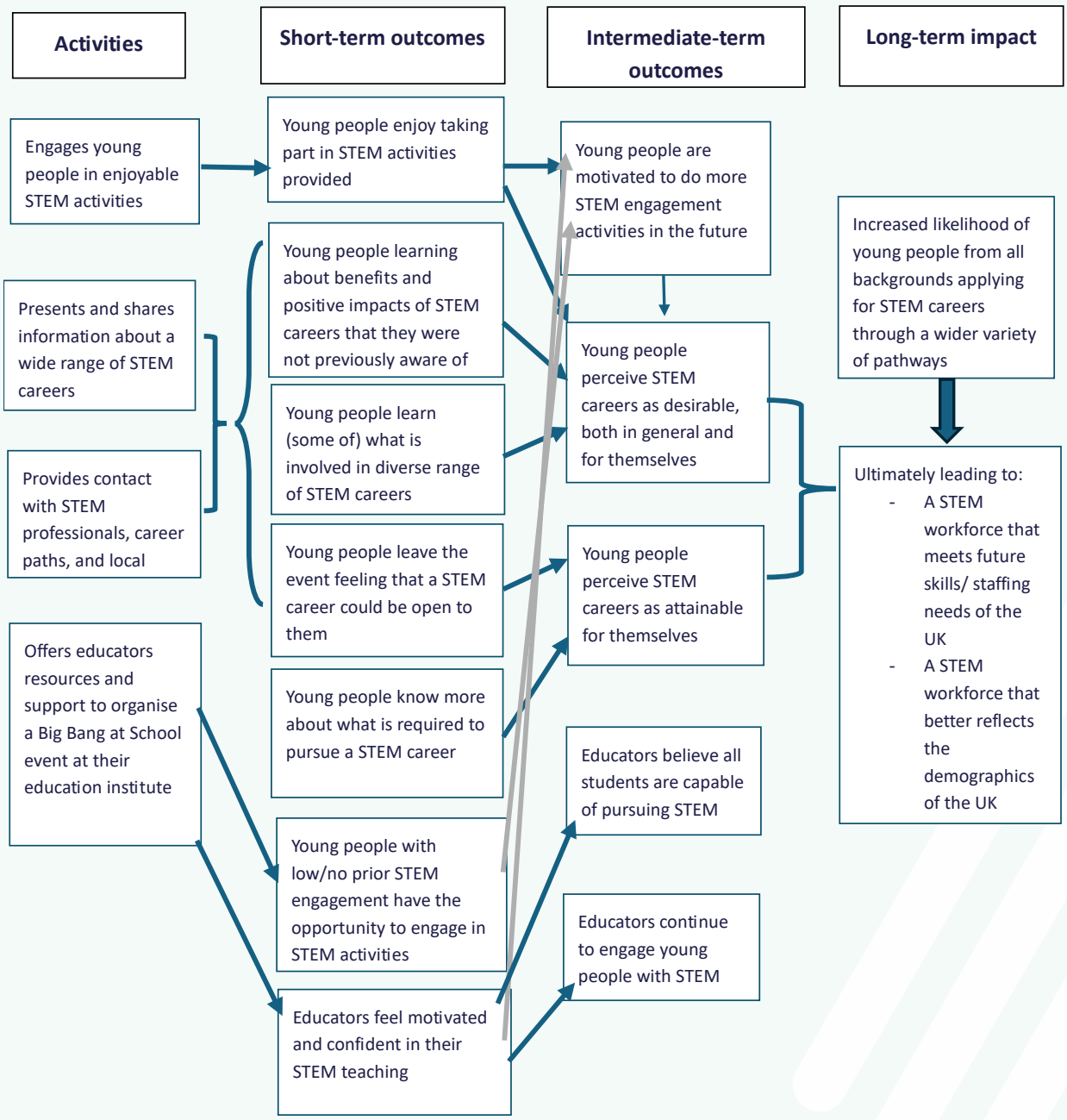
[4] Five delivery partners cover 9 regions in the UK (East of England, London, North West, Northen Ireland, South East, South West, Wales, Yorkshire and Humber, North East)

[5] Impact framework 2021. EngineeringUK. www.engineeringuk.com/research-and-insights/our-research-and-evaluation-reports/impact-framework/

- **motivating** them, getting young people interested in STEM activities and finding out more about STEM jobs, as well as feeling interested in these and like they would suit someone like them

Based on research related to students' career pathways (for example, the Science Education Tracker)[6], our Theory of Change assumes that influencing students' capabilities, opportunities and motivation will contribute to the long-term goal of helping young people make an informed choice about pursuing a career in STEM, and more of them choosing to do so (Figure 1).

Figure 1: Theory of Change for Big Bang at School



[6] Science Education Tracker 2023 (Wave 3). EngineeringUK and The Royal Society. www.engineeringuk.com/set

However, both the COM-B and Theory of Change models acknowledge that there are individual differences in how a given activity contributes to a certain outcome, so an important component of the evaluation is exploring whether Big Bang at School was experienced differently for different groups of students. Our target variables for this evaluation are those labelled as short-term outcomes in Figure 1.

Method

This year, we collected student feedback surveys, teacher feedback surveys, and teacher interviews from schools who took part in Big Bang at School.

The student feedback survey

The survey was available in an online format or a paper format to encourage participation from as many schools as possible. EngineeringUK's evaluation team provided the survey to all schools interested via the lead teacher of the event. Students were asked to complete the survey after they had taken part in their Big Bang at School event.

The survey took roughly 5 minutes to complete. Most questions related to the target outcome variables were a Likert scale structure, meaning that students responded on a 5-point scale with 1 being a negative response and 5 being positive. These questions also included a 'don't know' response option. Students were also asked about their previous engagement with STEM activities outside of the classroom, and their demographic background.

How we asked young people about engineering, technology, and science

Based on insights from cognitive testing and piloting a variety of question formats at The Big Bang Fair 2024, we asked students about engineering, technology and science in separate questions. Analysis of these outcomes is presented in two ways: (i) how students responded to the individual questions, and (ii) total scores reflecting how they responded across all three questions. For example, if students said that Big Bang at School made them more interested in a job in engineering and in technology but not in science, their total score across the three questions would be 2. If they responded positively to all three questions, it would be 3, and so on. We applied this approach to the following outcome measures: student motivation, interest and suitability.

Analytic approach

We present descriptive statistics (frequencies and percentages) for each of the student outcomes. Students who selected the 'don't know' option were included in these calculations to ensure the accuracy of the percentages.

To explore the impact of Big Bang at School on the outcomes, we considered how students' responses differed based on:

- what level of support their school received (Blueprint resources or Blueprint resources and delivery partner support)
- whether their school had run a Big Bang at School event before or not
- year group
- students' prior STEM engagement

Beyond these differences in programme delivery, we also explored whether there were additional differences related to gender, ethnicity, disability status and eligibility for free school meals.

We conducted multiple regressions to identify statistically significant differences between these groups. This approach allowed us to look at the relative influence of each variable compared to one another. The percentages presented based on these analyses exclude students who selected 'don't know', as they were excluded from the regressions as missing data.

We asked students one open-ended question in the student feedback survey around what they enjoyed the most about Big Bang at School. Responses were analysed using an inductive thematic approach, looking both at the breadth and coverage of the themes uncovered.

Sample description

A total of 3,727 students from 59 unique schools completed the student survey, which is a 24% response rate from schools delivering Big Bang at School this year. 3,248 of the 3,727 students completed the online version of the survey, and 479 completed the paper version. As we couldn't make questions in the paper survey compulsory for students to complete, there are some questions with missing responses. These have been removed from analysis.

In terms of programme delivery:

- 55% of respondents' schools received support from Blueprint resources and a delivery partner
- 45% of respondents' schools received support through Blueprint resources
- 62% of respondents' school had run a Big Bang at School event previously
- 38% of respondents' schools hosted a Big Bang at School event for the first time this year

These 2 variables are included in the multiple regressions as control variables to take programme delivery differences into account while exploring the impact of Big Bang at School across different groups of students. It should be noted that with schools who have hosted an event before, students aren't necessarily experiencing a Big Bang at School event again, nor that it is the same teacher delivering the event, we are just aware whether a school has taken part more than once.

Of the 3,727 students who completed the survey, 86% were from a priority school. Among these, nearly half (46%) were deemed a priority school because they have above average proportions of both students eligible for free school meals and students from UK minority ethnic backgrounds.

In terms of student demographics:

- 54% of survey respondents were female, 44% were male, and 2% other

- 16% of students were Asian, 9% Black, 7% from mixed ethnic backgrounds, 4% from other ethnic backgrounds, 8% didn't want to answer, and the remaining 64% were white
- 23% of students said that they had a disability or special educational need
- 29% said they received free school meals
- 38% of students were in year 7, 29% in year 8, 20% in year 9, 11% in year 10, and 1% in year 11

As not all students chose to answer every question, the percentages above exclude those saying don't know, prefer not to say, and that were missing.

Students were asked about the different types of STEM activities they had done outside of school before taking part in Big Bang at School. Students could tick multiple activities from a list, giving a sense of their overall engagement with STEM before taking part in Big Bang at School.

In general, students tended to have done at least one STEM activity outside of school in the last 12 months (Table 1). More than half of students said that they had engaged with STEM outside of school by seeing or reading something about science online (e.g., Instagram, TikTok, YouTube, news websites) (54%). The next most popular activities were watching a programme about science (32%), visiting a science museum or display (28%), and reading about science in a book, newspaper or magazine (23%).

Table 1: Frequencies and percentages of students' STEM activities in the last 12 months

Activity	Frequency	% of total sample
Saw or read something about science online (e.g., Instagram, TikTok, YouTube, news websites)	1,990	54%
Watched a programme or documentary about science on TV or streaming site	1,175	32%
Visited a science museum or display	1,033	28%
Read about science in a book, newspaper, or magazine	855	23%
Created your own computer game, blog, website or animation	817	22%
Attended a science, technology, engineering or maths club	468	13%
Went to a science, technology, engineering or maths fair	485	13%
Listened to a podcast or radio programme about science	368	10%
Attended an online science talk, webinar or an online museum activity about science	261	7%
None of the above	892	24%

Nearly a quarter (24%) of the current sample said they had not done any STEM activities outside of school in the last 12 months. This suggests that students who attend a Big Bang at School event don't always have a pre-existing interest in STEM, emphasising the importance of STEM outreach happening within schools to ensure wider participation.

As well as Big Bang at School, EngineeringUK also runs a yearly STEM fair in Birmingham for young people across the UK (The Big Bang Fair). In The Big Bang Fair 2025 evaluation, only 8% of 1,547 young people who attended The Fair said they had not done any STEM activities outside of school in the last 12 months. This is lower than Big Bang at School proportion of students who said they had not done any STEM activities (24%) and suggests programmes that schools can deliver in their own education institute, rather than travel to, reach more students who have no prior STEM engagement. This supports the activities rationale for Big Bang at School seen in the Theory of Change (Figure 1).

For the analysis of Big Bang at School, we split students into 2 groups, one consisted of students who had done 0 to 2 activities outside of school in the last 12 months ('low prior STEM engagement') and one who had done 3 or more activities ('high prior STEM engagement'). This resulted in 66% having low prior STEM engagement and 34% having high prior STEM engagement.

This binary variable was included in the multiple regressions to take young people's pre-existing interest in STEM into account while exploring the impact of Big Bang at School across different groups of students.

The teacher feedback survey

The teacher feedback survey was in an online format and was emailed to the lead teacher of each Big Bang at School event after the event had been delivered.

The survey took roughly 10 minutes to complete, and questions covered themes such as event organisation, their overall experience of Big Bang at School and working with delivery partners (if applicable), their opinions on student experience, accessibility, links to the curriculum, highlighting a variety of STEM careers through Big Bang at School, and teachers' confidence and knowledge around engineering and technology careers.

There were 3 open-ended questions in the survey asking teachers what they liked about Big Bang at School, what could be improved about working with delivery partners (if applicable), and general improvements that EngineeringUK could make. Comments were analysed using an inductive thematic approach, letting the responses guide the insights drawn.

Analytic approach

We present descriptive statistics (frequencies and percentages) for the close-ended questions in the survey. Teachers who selected the 'don't know' option were included in these calculations to ensure the accuracy of the percentages. For the open-ended questions, comments were analysed using an inductive thematic approach, letting the responses guide the insights drawn.

Sample description

Big Bang at School teacher feedback survey received 153 responses. Just over half of the responses (56%) were from schools who received delivery partner support, and 44% were from schools who received the Blueprint resources to support them.

Out of the 153 respondents, the most common roles were subject teachers (41%) and Head of Departments (39%). The most common subjects taught by these teachers were combined science (59%), physics (35%), chemistry (37%), and biology (36%), which is not surprising given Big Bang at School is pitched as a STEM event to schools.

At a school level, 145 unique schools completed the feedback survey (58% response rate from total schools worked with). 137 of the schools (94%) were priority schools, with 37% of schools having above average proportions of both students eligible for free school meals and students from UK minority ethnic backgrounds.

Just over half (57%) of the sample were from new schools who have not taken part in Big Bang at School before, and 43% were from schools who have taken part in Big Bang at School before.

Teacher interviews

We conducted 45-minute online interviews with the lead teacher for a schools' event after their Big Bang at School event had been delivered, and explored:

- teachers' reasons for taking part in the programme
- teachers' experience of Big Bang at School
- challenges teachers faced when organising their event
- improvements EngineeringUK can make
- student engagement
- student impact
- teacher confidence when discussing STEM careers with students
- teachers' future plans

Analytic approach

Interviews were analysed using an inductive thematic approach, letting the responses guide the insights drawn.

Sample description

We conducted 7 interviews with 7 teachers from 7 unique schools. These 7 schools consisted of 5 schools supported by the London delivery partner, and 2 schools who received Blueprint resources. Four schools had run a Big Bang at School event previously, and 3 were new to Big Bang

at School this year. Out of these schools, 5 were priority schools[7], with 4 having above average proportions of students on free school meals and from UK minority ethnic backgrounds, and one school being a single sex (girls) schools with above average proportions of students on free school meals or from UK minority ethnic backgrounds.

Student results

Student analysis is grouped into outcomes and discusses significant differences between groups for these outcomes. For a breakdown of all differences between groups for all outcomes, see Appendices 1 and 2.

Did students enjoy Big Bang at School?

Positively, over two-thirds of students (66%) said that they enjoyed Big Bang at School (42% agreed, 24% strongly agreed). Only 8% actively disagreed with this statement, and 26% neither agreed nor disagreed, or didn't know if they enjoyed Big Bang at School.

There were significant differences in year group, with year 7 students and year 8 students responding more positively (75%, 74% respectively) compared to older years like year 10 and Year 11 (66% and 60%, respectively). It is possible that year 7s have greater enthusiasm for these kinds of events, and approach with more commitment and engagement than their older peers. This aligns with findings from the SET[8], with younger students being more engaged in STEM than older students. It may also be tied to the content of the activities, as these tend to align with the curriculum for years 7 to 9.

Students with high prior STEM engagement (i.e., those who had been to 3 or more STEM-related activities outside of school in the last 12 months) responded significantly more positively (80%), compared to students with low prior STEM engagement (68%). In other words, students already interested in STEM tended to enjoy the event more, which echoes findings from EngineeringUK's other programme evaluations (e.g., The Big Bang Fair 2025). However, 68% of students in the low prior STEM engagement group still agreed that they enjoyed the event, which tells us that the programme did not just engage students already interested in STEM.

With regards to demographic differences, students from white backgrounds responded more positively (75%) compared to students from UK minority ethnic backgrounds (70%). Non-disabled students also responded more positively (76%) than disabled students (68%).

It should be noted that responses in general were very positive across all groups. The majority enjoyed the event regardless of their demographic background. See Appendices 1 and 2 for responses per outcome between groups.

[7] EngineeringUK's priority school approach identifies schools with high proportions of students from underrepresented groups in engineering. The aim is to target programs and support to these schools to increase diversity in the engineering and technology workforce. For more detail, see https://www.tomorrowsengineers.org.uk/improving-practice/resources/engineeringuk-priority-schools-criteria/

[8] Science Education Tracker 2023 (Wave 3). EngineeringUK and The Royal Society. www.engineeringuk.com/set

Additionally, there were no significant gender differences in students' enjoyment, with boys only enjoying the event one percentage point (pp) more than girls (73%, 72% respectively). As we know that enjoyment is an essential pre-requisite for students to engage, learn and be inspired, this is very positive.

We also asked what students enjoyed most about Big Bang at School and 3,140 students left a comment for this question, including students who have made comments like 'not sure' and 'don't know'. The most common response about what students enjoyed were the activities at the event (18%) and making and/or building (14%). See Table 2 presenting the breadth of the top responses that students provided.

Table 2: Themes and frequencies related to what students enjoyed most about their Big Bang at School event from respondents who answered enjoyment open-ended question

Theme/code	Frequency	% of respondents
General activities	561	18%
Making/ building	435	14%
Designing/creativity	171	5%
Experiments/projects/interactive	170	5%
Working as a team / working with friends	163	5%
Fun/general enjoyment	138	4%
Robots	122	4%
Coding	113	4%
Learning new information	84	3%
The whole Big Bang at School event	81	3%
Learning about careers in general	47	1%
Learning about engineering and what engineers do	17	1%

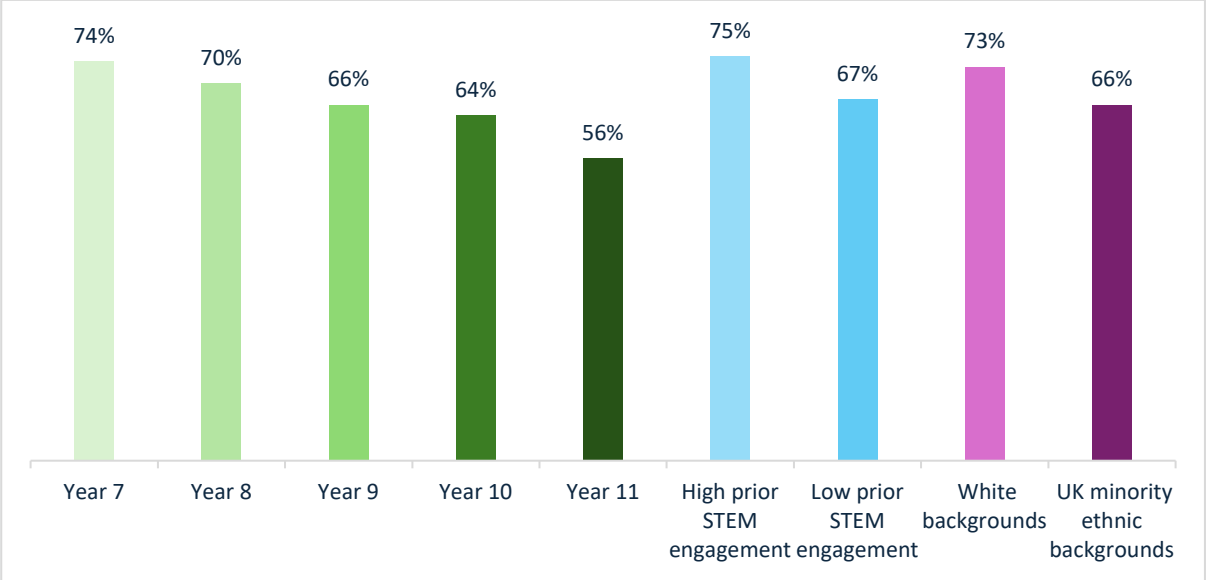
Did Big Bang at School improve students' knowledge of the different types of things engineers can do in their jobs?

Positively, 64% of students strongly agreed or agreed that Big Bang at School has shown them the different types of things engineers can do in their jobs.

There were 3 significant differences in how students responded to this outcome (see Figure 2). Students from younger year groups responded more positively compared to students from older

year groups, and students who had high prior STEM engagement responded more positively than students from low prior STEM engagement. Additionally, students from white backgrounds responded more positively than students from UK minority ethnic backgrounds.

Figure 2: Significant differences between student groups for Big Bang at School improving students' knowledge on the different types of things engineers can do in their jobs



As stated before, while it is important to recognise significant differences, it is equally important to note that responses in general were very positive across all groups with significant differences as seen in Figure 2. There were also no significant gender differences, with boys and girls responding very similarly (72% and 70%, respectively). This is a finding we also see across EngineeringUK's other programmes (The Big Bang Fair 2024, Energy Quest 2024). This is particularly positive, given knowledge, interest and confidence in STEM was found to be lower for girls at a national level.[9]

Did Big Bang at School motivate students to do more STEM activities and find out more about jobs in STEM?

Just under half of the students agreed or strongly agreed that Big Bang at School made them:

- want to do more engineering, technology and science activities in the future (49%)
- want to find out more about jobs in engineering (43%)
- want to find out more about jobs in technology (48%)
- want to find out more about jobs in science (44%)

Two-thirds (66%) said Big Bang at School made them want to find out more about jobs in one or more of the subject areas, and 44% wanted to find out more about jobs in two or more of the subject areas.

[9] Science Education Tracker 2023 (Wave 3). EngineeringUK and The Royal Society. www.engineeringuk.com/set

There were differences by age, with students from younger year groups responding more positively compared to older year groups to wanting to find out more about engineering and technology jobs. This may be because older year groups may already have an idea of what jobs they want to do when older, so are less motivated to find out more about jobs they are not already intending to pursue. Interestingly, students from year 11 responded more positively than younger year groups about wanting to find out more about science jobs. This may be explained by two-thirds of the year 11 sample being girls (19, 68% of sample), reflecting the gender differences we see at a national level[10] with girls and boys being interested in science at the same level. See Table 3.

Table 3: Significant differences in year group for motivation outcomes

Outcome	Low prior STEM engagement	High prior STEM engagement	Y7	Y8	Y9	Y10	Y11
Motivation to find out more about engineering jobs	42%	55%	49%	48%	44%	42%	34%
Motivation to find out more about jobs in technology	48%	61%	57%	52%	50%	44%	46%
Motivation to find out more about jobs in science	41%	61%	50%	48%	46%	43%	69%

Again, students' motivation to do more STEM activities varied with prior STEM engagement, with those with high prior STEM engagement (66%) responding more positively compared students with low prior STEM engagement (47%). Students' motivation to find out more about engineering, technology and science jobs also varied with prior STEM engagement, with those with high prior STEM engagement responding more positively compared students with low prior STEM engagement (Table 3). Still, nearly half (47%) of students who had done few or no STEM activities outside of the classroom in the last 12 months said they would like to do more activities in the future, and nearly half want to find out more about engineering, technology and science jobs (42%, 48% and, 41% respectively).

There were significant gender differences in 3 of the motivation outcomes. Boys responded more positively to wanting to do more engineering, technology and science activities in the future (59%) than girls (50%). Boys were also more likely to say that Big Bang at School had motivated them to find out more about jobs in engineering (55%) and technology (58%), compared with girls (41% and 50%, respectively). This likely reflects pre-existing gender differences in girls' and boys' motivation towards STEM careers.[10] However, it is worth noting that almost half of the girls

[10] Science Education Tracker 2023 (Wave 3). EngineeringUK and The Royal Society. www.engineeringuk.com/set

responded positively to these questions, which is more than the percentage of girls generally interested in these careers reported at the national level.[10] There were also no significant gender differences in students wanting to find out more about jobs in science. These suggest that the programme successfully encouraged girls towards more STEM activities and find out about jobs in engineering, technology and science.

With regards to ethnicity, students from white backgrounds responded significantly more positively to finding out more about engineering (49%) compared to students from a UK minority ethnic background (44%). However, students from a UK minority ethnic background responded more positively to wanting to find out more about science (51%) compared to students from a white background (46%).

Non-disabled students responded significantly more positively than disabled students to wanting to do more engineering, technology and science activities in the future (56%, 53% respectively). Significant differences were also seen with non-disabled students responding more positively to wanting to find out more about jobs in technology and science (56%, 51%) compared to disabled students (50%, 46%). This is an interesting finding as this is not the case at a national level[11], where SEND students were found to be interested in technology jobs. Additionally, it is important to note that there were no significant differences between disabled and non-disabled students' motivation to find out more about engineering jobs.

Did Big Bang at School increase students' interest in STEM jobs and perception of STEM as suitable for someone like them?

Interest in STEM jobs

Over a third of students said Big Bang at School made them more interested in a future job in engineering (38%), technology (40%) or science (36%). 60% said it made them more interested in jobs in one or more of the subject areas, and 36% were more interested in jobs in two or more of the subject areas.

Students from younger year groups were more interested in engineering and technology jobs after Big Bang at School, which is consistent with the national level's findings[11] where interest in STEM careers is highest in year 7 and then declines steadily through the remaining years until year 13. Again, students with high prior STEM engagement responded more positively on the interest statements compared to those with low prior STEM engagement. See Appendix 1 for the breakdown of significant differences between prior STEM engagement groups and year groups for interest outcomes.

There were also gender differences, with boys responding more positively in being more interested in having a future job that involves engineering (53%) and technology (48%) compared to girls (34% and 35%, respectively). There were no gender differences in interest in a future job that involves science, which is consistent with the national level[11], where the level of interest in science

[11] Science Education Tracker 2023 (Wave 3). EngineeringUK and The Royal Society. www.engineeringuk.com/set

jobs is more equal between males and females, compared to engineering and technology. Taken together, these suggest that the gender differences recorded in the current evaluation are likely to reflect pre-existing differences, rather than a differential impact of Big Bang at School on increasing students' interest in engineering and technology careers.

With regards to ethnicity, students from white backgrounds responded more positively to being interested in a future job that involves engineering (45%), compared to students from UK minority ethnic backgrounds (40%). Students from UK minority ethnic backgrounds responded more positively around interest in science jobs (46%) compared to students from white backgrounds (38%).

Students eligible for free school meals and not eligible for free school meals both responded positively overall to being interested in both engineering and technology jobs (see Appendix 2). There were significant differences in these outcomes for these groups, and when looking into this more closely, students eligible for free school meals responded slightly more negatively to being interested in engineering and technology jobs compared to students not eligible for free school meals.

Disabled students responded slightly more negatively to being interested in technology and science jobs compared to non-disabled students. However, both groups responded positively overall (see Appendix 2), suggesting Big Bang at School increases interest in STEM across demographic groups.

Suitability

Although 'suitable for someone like me' could be interpreted in different ways, previous testing of this phrasing showed that young people understood the statement to mean a job that aligns with their interests, skills and what they enjoy doing or studying. Overall, this question offers an insight into Big Bang at School's effectiveness at promoting STEM careers to all students, whatever their background or identity.

More than half of all students either agreed or strongly agreed that Big Bang at School had shown them that jobs in engineering (32%), technology (38%) or science (33%) would be suitable for someone like them. 54% of students agreed with at least one of these statements, with 31% of the sample agreeing with 2 or more.

Interestingly, year 11 responded more positively in being shown technology is suitable for someone like them compared to younger year groups. See Appendix 1 for the breakdown of significant differences between year groups for interest outcomes.

The familiar pattern of differences relating to prior STEM engagement was seen, with around a third of the students in the low STEM engagement group saying Big Bang at School showed them that a job in engineering (32%), technology (37%) or science (30%) was suitable for someone like them compared with 43%, 52% and 51% of students in the high STEM engagement group (respectively).

Although disabled students responded slightly more negatively to technology being a suitable job for someone like them compared to non-disabled students, both groups responded positively

overall, with 46% of both groups responding positively to the statement. Disabled students also responded slightly more negatively to engineering being a suitable job for someone like them. Again, both groups responded positively overall (see Appendix 2), showing Big Bang at School supports all students in these outcomes.

Again, there were gender differences for being shown that engineering and technology jobs are suitable for someone like them, with boys responding more positively than girls. Like the motivation and interest outcomes, there were no gender differences with suitability to a science job. Other demographic differences include students from white backgrounds responding more positively to being shown that engineering jobs are suitable for someone like them. See Appendix 2 for the breakdown of significant differences between demographic groups for interest outcomes.

Teacher results

What motivated teachers to take part in Big Bang at School?

It's clear EngineeringUK's goals for Big Bang at School align with teacher's motivations for participating. Teacher's motivations were varied, but have been summarised into 5 main categories of what they wanted to do:

- organise an event to inspire students about a wide range of exciting opportunities in STEM
- bring STEM learning to life and engage students with hands on activities, and not just through presentations
- increase students' science interest and passion in STEM subjects
- improve students' engagement and uptake for science by incorporating more creativity
- showcase real life applications to STEM careers

What was teachers' experience of Big Bang at School?

Overall, teachers' experience of Big Bang at School was very positive. Nearly all (98%) of the surveyed teachers rated their experience as excellent or good. Teachers were asked what they liked about Big Bang at School in the teacher feedback survey. Key themes from what teachers liked included:

- having flexibility in organising the event
- receiving support from delivery partners
- how the events engaged students through highlighting STEM careers, bringing in STEM role models (STEM ambassadors, STEM organisations, etc.)
- being able to target/invite more students than they otherwise would be able to because they organised the event in their own school

Survey respondents who received support from delivery partners were also asked about their experience working with the delivery partners to run their Big Bang at School event. Out of the 75 respondents who answered this survey question, nearly all teachers (95%) rated their experience working with a delivery partner as excellent or good.

This is supported by the teacher interview findings, as all 5 interviewees who received support from EngineeringUK as the London delivery partner reflected positively on the experience. The teachers appreciated the personalised support provided for each of their events. This included being sent bid links to be able to apply for extra funding, attending in-person planning meetings to adapt to teachers' preferred way of working, brainstorming ideas for the event, and helping to set up for the event:

"I think especially towards the end of the planning you [EngineeringUK] asked is there anything else we can do or add or any speakers that could come in especially on those days so the brainstorming and planning I think it was very, very useful."

– interviewed teacher

What challenges did teachers experience?

Funding was the most common challenge throughout the interviews and feedback survey, with 3 interviewed teachers and 14 surveyed teachers noting this. Recommendations for supporting teachers with this included increasing the amount for some schools who received a bursary, and signposting schools to additional grants or funding opportunities.

In the interviews, 3 teachers also mentioned difficulties with organising the events, for example, ensuring enough rooms are available in the school to host the event, and keeping track of emails from a range of organisations. One teacher who was new to the school this year discussed how challenging navigating a new school's system was when organising an event. Recommendations for supporting teachers with this could include creating a teacher network where teachers support other teachers to run their events.

What were teachers' views on student engagement?

Teachers' views on student engagement with Big Bang at School were very positive. Nearly all the surveyed teachers strongly agreed or agreed that Big Bang at School was engaging for their students (95%). In teacher's written feedback in the survey, student engagement was one of the most common themes, with 19% of teachers commenting on this. Teachers spoke to how applying the event to real life applications of STEM and inviting STEM role models to the events supported student engagement:

"Big Bang program brought a wave of excitement and curiosity to our school. We appreciated its hands-on approach to learning, which allowed students to engage directly with scientific concepts through experiments and interactive projects. Additionally, the involvement of industry professionals provided invaluable insights into real-world applications of STEM subjects, inspiring students to consider careers in these fields. Overall, Big Bang Blueprint made science fun, accessible, and deeply engaging for all students"

– surveyed teacher

"The opportunity to engage students with activities and sessions that we would otherwise be unable to undertake. Access to STEM ambassadors from industry to engage with students and give them real world insights, as well as building links to industry for the subject and careers education/guidance."

– surveyed teacher

These positive views on student engagement were echoed in the teacher interviews, with all 7 interviewed teachers commenting on how well students engaged during their schools' Big Bang at School. One teacher noted how student attendance for events is normally lower than usual school days, however for their Big Bang at School event, attendance was the highest it had been for the year group of students that were attending the event:

"Student attendance on a drop-down day you tend to find a decline in attendance. But obviously on that day when they know it's a STEM week and [teacher name] is bringing in the creatures etcetera, attendance is really great and we had the highest attendance for year 7 that day of 96.5%. So, it was really, really good to see."

– interviewed teacher

Two of the interviewed teachers commented on how their Big Bang at School engaged students due to the teamwork aspects in the workshops at their events, which echoes what students found engaging in evaluations of EngineeringUK's Big Bang Fair and Energy Quest programmes. Additionally, one teacher described how their students have continued to be engaged with science after their event and noted that students are relating the curriculum to what they learnt during their event:

"This week we've already had some science lessons, and if you walk into some of the rooms, they are more engaged. They can see what they've learnt and have applied to the practical skill that they worked on during the event. It's much easier to get them to relate the curriculum content to the activity that they did"

– interviewed teacher

What were teachers' views on how Big Bang at School impacted students?

We discussed the impact of Big Bang at School on students in the teacher interviews. Three teachers from schools who have previously taken part in Big Bang at School spoke about the impact on previous cohorts of students. One teacher discussed how students who have participated in the event when they were in year 7 still talk about the event 2 years later. Another teacher spoke about how after their event last year, year 9 students had to choose their GCSE options, and so many more chose triple science. This is similar to another teacher's experience, who after their event last year, had an increase in students choosing a physics A level.

"We ran a Big Bang at School on a smaller scale last year. It was the first time we've done something like that. And our we then had options where students chose their options for GCSE and because we did something like [Big Bang at School] that triple science became completely full as an option."

– interviewed teacher

"That experience that they're going to hold forever is something that motivates me, obviously to kind of do that for all students and ensure that the community is covered year on year when we're doing that as well"

– interviewed teacher

Interviewed teachers spoke about how having visits from external organisations help to inspire and engage their students and make them more aware of STEM careers. This finding is supported by the teacher feedback survey findings as 88% of surveyed teachers strongly agreed or agreed that their Big Bang at School highlighted a wide variety of careers in engineering, science and technology and commented on this in their written feedback:

"Students were told how all of these skills linked to further careers and this makes it easy to link back to when we move through school highlighting factors for employment. Gave students a wider range of jobs they could consider high skill which helps raise aspirations."

– surveyed teacher

"The sessions are so well organised, engaging and give our students the opportunity to carry out experiences that encourages them to thrive in a science field."

– surveyed teacher

Additionally, interviewed teachers spoke about how Big Bang at School gets students to relate the curriculum content to an event. This is echoed in the teacher feedback survey findings, with nearly all of the surveyed teachers (93%) strongly agreeing or agreeing that Big Bang at School had links to the school curriculum.

Is Big Bang at School accessible to students?

The majority (93%) of surveyed teachers strongly agreed or agreed that Big Bang at School was accessible to students of all abilities in STEM subjects. This is reflected in teacher's written feedback:

"Big Bang at School was a fantastic opportunity for our students, most of them come from minority backgrounds and/or with disabilities, to engage with STEM in an exciting and meaningful way. The event provided hands-on experiences that made science and engineering more accessible, inspiring curiosity and confidence. It was great to see students exploring new concepts, working collaboratively, and learn more about STEM career fields."

– surveyed teacher

"We were thoroughly impressed with Big Bang at School experience. The workshop delivered to our SEMH pupils was outstanding—engaging, inclusive, and perfectly pitched to meet their needs. It was fantastic to see such a high level of participation and enthusiasm from our students, many of whom don't typically engage so readily. The facilitator built trust quickly and brought a brilliant mix of care, understanding, and energy."

– surveyed teacher

Did Big Bang at School support teachers to feel more knowledgeable and confident when talking to students about STEM careers?

Beyond its impact on young people, Big Bang at School aims to improve teachers' knowledge and confidence to discuss engineering and technology careers with students. In the teacher feedback survey findings, 80% of surveyed teachers said that they were more knowledgeable about careers in engineering and technology after taking part in Big Bang at School. Additionally, 82% of teachers said they felt more confident in speaking to students about careers, and 88% were more likely to suggest to a student that they consider a career in engineering and technology.

These findings are also supported by the teacher interviews as five teachers described themselves as feeling quite confident when talking to students about STEM careers, and 2 teachers felt very confident as they had both worked in STEM careers before becoming a teacher:

"I feel confident in the aspects of your very generic STEM careers. You know, go to university, do medicine or you go to university, do engineering or architecture. I think what we don't feel confident about is the other routes in skills, careers and the niche careers within them that you know we never really get exposed to."

– interviewed teacher

Four of the interview teachers noted that the resources EngineeringUK provided made them feel more confident in discussing these with students, especially the booklets and posters about STEM careers:

"I really like the resources that we got from EngineeringUK… all the booklets and posters about careers and engineers. I found that really useful because that was something we could give to the students. And we have some year 11 students that were particularly interested in engineering and I couldn't give them a detailed answer"

– interviewed teacher

Three interviewed teachers also commented on how planning Big Bang at School event helped them to feel more prepared to discuss STEM careers with their students, including how Big Bang at School event supported other staff in the school to learn new things:

"I think doing the planning and organisation of it [Big Bang at School event] helped me learn more about what's out there in terms of like university enrichment and things like that. But also I think because the students had those events and activities, they learnt more about it, so I was able to discuss better with them regarding their careers."

– interviewed teacher

"I think these events are really important, not only for the children, but also for the staff because they have an insight into careers and I always learn. So I'm like, oh, wow, I didn't know that. Oh, that's really interesting. And then they can relate that to other classes"

– interviewed teacher

What are teachers' plans for future STEM engagement?

There is increasing recognition that on its own a single STEM outreach experience is unlikely to have a long-lasting impact on young people's aspirations towards STEM careers.[12] We hope after delivering a Big Bang at School, teachers keep engaging with STEM outreach experiences for their students as long-term, repeated interaction fosters a lasting interest in engineering among young people.

Students weren't the only ones left wanting to do more STEM activities after Big Bang at School, 6 out of the 7 teachers we interviewed also mentioned how they would like to deliver Big Bang at School again next year and use the resources in other STEM activities. Teachers also mentioned they were hoping to introduce more STEM clubs, plan more trips, and engineering activities.

"I really enjoyed it and it's going to be something that I do at my new school because I think it's so important and it keeps the teachers' passion alive it keeps the passion of the students alive"

– interviewed teacher

Big Bang at School also provides teachers with resources that they can use to run events again in the future to continue future STEM engagement. Nearly all of the surveyed teachers (93%) strongly agreed or agreed that Big Bang at School motivated them to organise more STEM activities for their students.

"Encourages and motivates teachers to get involved in running STEM projects or activities within their school setting. Also can give ideas if new to running events."

– surveyed teacher

"The range of STEM subjects that it accesses, and the cross-curricular nature of what can be accomplished. This is something we'd definitely like to explore further in the future."

[12] Going beyond the one-off: How can STEM engagement programmes with young people have real lasting impact? 2020. Archer, M., DeWitt, J., Davenport, C., Keenan, O., Coghill, L., Christodoulou, A., ... & Hou, L.

–surveyed teacher

Three quarters of teachers (76%) strongly agreed or agreed that Big Bang at School has given them resources they can use in their role and one interviewed teacher also said they are planning to use the resources in future STEM activities in the school. Although this is still a positive finding, there remains room for improvement. For example, highlighting to teachers how the resources could be used in future science lessons, science clubs or assemblies resources that teachers can use in their role would help teachers maintain the interest generated by Big Bang at School amongst students with low prior STEM engagement.

Conclusion

Students

Big Bang at School 2025 successfully engaged a diverse group of students, with strong evidence that it positively influenced their enjoyment, knowledge, motivation, and interest in STEM careers (Table 4).

Table 4: Summary of students' responses across key outcomes

Outcome measure	% of students responding positively
Enjoyment	66%
Motivation to do more engineering, technology and science activities in the future	49%
Knowledge of what engineers can do in their jobs	64%
Motivation engineering jobs	43%
Motivation technology jobs	48%
Motivation science jobs	44%
Suitable engineering jobs	32%
Suitable technology jobs	38%
Suitable science jobs	33%
Interest engineering jobs	38%
Interest technology jobs	40%
Interest science jobs	36%

While overall responses were positive, there were some gaps between groups of students. High prior STEM engagement was a predictor of responding more positively on all outcomes, which is expected. This was why we took this variable into account when running the regression analysis. However, responses from students in low prior STEM engagement groups were still positive overall, suggesting that the impact of Big Bang at School is not limited to only those who are already engaged in STEM.

There were significant gender differences in 7 of the outcomes, which mirrors those reported at a national level[13] and EngineeringUK's Big Bang Fair 2025 and 2024/25 Energy Quest. While girls and boys reported similar experiences in terms of enjoyment of the event, being shown the different types of things engineers can do, and the outcomes relating to science, compared with girls, boys were more likely to say that Big Bang at School had made them:

- want to do more engineering, technology and science activities in the future
- want to find out more about engineering jobs
- want to find out more about jobs in technology
- feel like engineering is suitable job for someone like them
- feel like technology is suitable job or someone like them
- more interested in having a future job that involves engineering
- more interested in having a future job that involves technology

These differences likely reflect broader systemic patterns in STEM engagement and identity, as seen in the SET.[13]

- only 16% of girls **agreed** that engineering was a suitable career for someone like them, compared with 44% of boys
- 29% of girls were interested in an engineering career, compared with 63% of boys

Without pre-event measures of participants' perceived capabilities and motivation, we cannot tell for certain whether Bang at School helps narrow existing gaps. However, there are key differences between gender gaps reported at the national level and in our current sample that suggest Big Bang at School is effective in narrowing these:

- the gender gaps recorded here are substantially narrower than those reported at the national level
- overall percentages for female students are very positive across all outcomes
- the gender differences described here take existing differences in students' prior STEM engagement into account

There were also gaps in the experiences of disabled and non-disabled students, for example, in terms of how much they enjoyed their Big Bang at School event (with disabled students being less

[13] Science Education Tracker 2023 (Wave 3). EngineeringUK and The Royal Society. www.engineeringuk.com/set

positive than non-disabled students overall). Furthermore, compared with non-disabled students, disabled students were less likely to say that Big Bang at School had made them:

- want to do more engineering, technology and science activities in the future
- find out more about jobs in technology
- find out more about jobs in science
- more interested in a job that involves engineering
- more interested in a job that involves science

However, as with that recorded for girls and students with low prior STEM engagement, the overall proportions of disabled students responding positively across the individual outcome variables suggests that the positive impact of Big Bang at School extended to disabled and non-disabled students alike.

Teachers

Like students, teachers were also very positive about their experience of Big Bang at School. Many interviewed and surveyed teachers had plans to keep engaging their schools in STEM experiences by either running Big Bang at School again or using the Blueprint resources again. See Table 5 for a summary of teacher survey outcomes.

Table 5: Summary of teacher survey outcomes

Teacher survey outcome	% of teachers strongly agreeing or agreeing
Big Bang at School…	
was engaging for my students	95%
had links to the curriculum	93%
was accessible to students of all abilities in STEM subjects	93%
highlighted a wide variety of careers in engineering, technology, and science	88%
After taking part in Big Bang at School teachers were…	
more knowledgeable about careers in engineering and technology	80%
more confident in speaking to students about careers in engineering and technology	82%
more likely to suggest to a student that they consider a career in engineering and technology	88%

Recommendations

Build on momentum for students with low prior STEM engagement

EngineeringUK should continue to encourage schools to take part in Big Bang at School again in future years and also provide follow-on activities for schools to use to continue with STEM engagement after Big Bang at School. Although teacher outcomes were very positive, the lowest response was for teachers feeling they can use Big Bang at School resources in their roles. This could go hand in hand with building momentum for students with low prior STEM engagement by updating resources and/or providing more resources that teachers can use in their role further. This could also include highlighting to teachers how the resources could be used in future science lessons, science clubs or assemblies to continue to engage low prior STEM engaged students.

Explore the experiences of disabled students in more detail

It is unclear in the current analysis whether the differences in how disabled students responded on questions were genuine differences in their experiences or in how they understood and responded to the question. As part of our work for 2025/26, the evaluation team is exploring how existing feedback surveys should be adapted for different groups of disabled students.

Continue to improve on the good work around gender

The analysis of the responses by gender showed significant differences in many areas, with girls reporting lower motivation, interest and suitability for engineering and technology jobs than boys. However, girls still responded positively to all outcomes and these gaps are much narrower than national benchmarks.[14] These all come together to suggest Big Bang at School is having a positive impact on girls' perceptions of engineering and technology, and its suitability as a career for them. The EngineeringUK team should continue to ensure there are resources and activities provided to schools are suited to girls, along with ensuring external factors that attend Big Bang at School events are positive role models for girls. Additionally, EngineeringUK should provide schools with more support to tackle girls' motivations in STEM and continue developing content which has a bias towards engaging girls.

[14] Science Education Tracker 2023 (Wave 3). EngineeringUK and The Royal Society. www.engineeringuk.com/set

Appendices

Appendix 1: Differences between prior STEM engagement groups and year groups per outcome

Outcome	Low prior STEM engagement	High prior STEM engagement	Y7	Y8	Y9	Y10	Y11
Enjoyment	68%	80%	75%	74%	66%	66%	60%
Motivation to do more engineering, technology and science activities in the future	47%	66%	57%	53%	52%	50%	56%
Knowledge of what engineers can do in their jobs	67%	75%	74%	70%	66%	64%	56%
Motivation engineering jobs	42%	55%	49%	48%	44%	42%	34%
Motivation technology jobs	48%	61%	57%	52%	50%	44%	46%
Motivation science jobs	41%	61%	50%	48%	46%	43%	69%
Suitable engineering jobs	32%	43%	36%	36%	36%	33%	47%
Suitable technology jobs	37%	52%	45%	41%	43%	34%	47%
Suitable science jobs	30%	51%	38%	37%	39%	33%	54%
Interest engineering jobs	38%	51%	43%	44%	39%	44%	29%
Interest technology jobs	36%	50%	45%	40%	36%	34%	30%
Interest science jobs	34%	53%	42%	40%	39%	36%	57%

Note. Shaded cells indicate statistically significant differences at the $p < .05$ level.

Appendix 2: Differences between demographic groups per outcome

Outcome	Female	Male	UK minority ethnic	White	No FSM	FSM	Non-disabled	Disabled
Enjoyment	72%	73%	70%	75%	74%	70%	76%	68%
Motivation STEM activities in the future	50%	59%	53%	55%	55%	55%	56%	53%
Knowledge of what engineers can do in their jobs	70%	72%	66%	73%	72%	66%	72%	67%
Motivation engineering jobs	41%	55%	44%	49%	48%	46%	48%	48%
Motivation technology jobs	50%	58%	51%	54%	53%	52%	56%	50%
Motivation science jobs	50%	47%	51%	46%	49%	50%	51%	46%
Suitable engineering jobs	27%	47%	34%	38%	37%	36%	38%	39%
Suitable technology jobs	35%	52%	43%	44%	43%	44%	46%	46%
Suitable science jobs	37%	39%	42%	36%	38%	36%	41%	38%
Interest engineering jobs	34%	53%	40%	45%	44%	42%	45%	40%
Interest technology jobs	35%	48%	41%	42%	42%	42%	43%	42%
Interest science jobs	42%	39%	46%	38%	40%	41%	42%	40%

Note. Shaded cells indicate statistically significant differences at the $p < .05$ level.