

Goldman Sachs Gives-sponsored intensive STEM Camps 2023: evaluation report

Key findings

- 80% of students agreed or strongly agreed their camp improved their understanding of science.
- 72% of students agreed or strongly agreed their camp helped them build the knowledge they will need to succeed in their GCSEs.
- 70% of students agreed or strongly agreed their camp will help to prepare them for the next school year.
- All teachers surveyed strongly agreed the camp was well organised and planned.
- All teachers surveyed agreed or strongly agreed the camp will help to prepare the students for their studies in the upcoming academic year.
- All teachers surveyed agreed or strongly agreed the camp covered topics which will help the students to succeed in their GCSEs.

Introduction

STEM Learning ran 10 intensive STEM Camps in the South East of England over summer 2023: two in Isle of Wight, two in Kent, one in Dorset, one in East Sussex, one in Surrey, one in Reading, one in Stoke Poges, and one in Carterton. Goldman Sachs Gives is committed to fostering innovative ideas, solving economic and social issues, and enabling progress in underserved communities globally. Through a donor-advised fund, Goldman Sachs' current and retired senior employees work together to recommend grants to qualifying nonprofit organizations to help them achieve their goals. Since 2010, Goldman Sachs Gives has granted more than \$2 billion to 9,000 nonprofits in 100 countries around the world.

The camps were run for various reasons based on a needs analysis undertaken by each participating school and included re-engagement with science, increasing confidence, and pushing towards higher grades. All camps were predominantly aimed at Year 9 and 10 students, with one group of Year 8 students. The camps had a day each of practical biology, chemistry and physics and a half day of data science, followed by an inspirational afternoon of careers-focused activity delivered by a diverse group of STEM Ambassadors. STEM Learning's Impact and Evidence team issued surveys to students and teachers before and after attending a camp to investigate the quality and impact of the camps.

The student pre-camp survey received 156 complete responses and the student post-camp survey received 75 complete responses. The teacher pre-camp survey received 5 complete responses and the teacher post-camp survey received 4 complete responses. The student and teacher surveys closed on 18th September 2023. Complete responses were analysed and supplemented by partial responses where appropriate.

Student feedback

Students were asked to rate their agreement with various statements before and then after the camp (Figure 1). We compared these answers between the pre-and post-camp surveys to determine whether the camps had impacted students' attitudes towards STEM subjects.

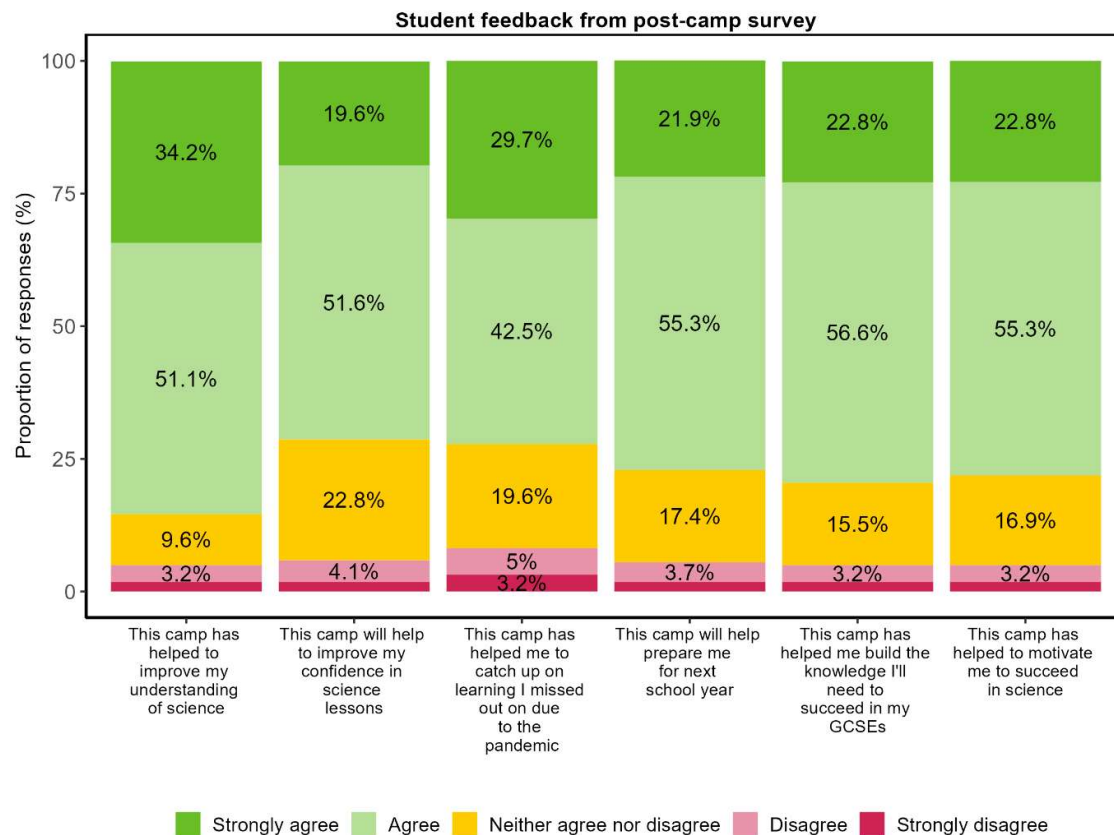
Before the camp, 54% of students agreed or strongly agreed that what they learned in science lessons was important to everyday life. After the camp, this percentage increased to 63%. Similarly, students' belief in their capability to perform well in their science GCSEs saw a positive shift. Prior to the camp, 64% of students agreed or strongly agreed that they believe they can do well in their science GCSEs and after the camp; this increased to 75% of students agreeing with the statement. Before the camp, 56% of students agreed or strongly agreed that they think they are the type of person who could work in science, design and technology, engineering, maths or computing, which increased to 59% after attending a camp.

Figure 1. Student feedback from the pre-camp and post-camp surveys.



Additionally, in the post-camp survey, students were asked how the camp had helped them or how the camp will help them in the future. 80% of students agreed the camp helped to improve their understanding of science, 72% agreed the camp has helped them build the knowledge they will need to succeed in their GCSEs, and 70% agreed the camp will help to prepare them for the next school year (Figure 2).

Figure 2. Student feedback from the post-camp survey



Students shared what they found to be the most interesting part of the camp. Various students shared that they found the practicals and experiments to be interesting, particularly the physics practical. Students also expressed that they found the computer science sessions and using Micro:bits interesting. Many students also expressed how much they enjoyed the biology day, as they found the potato practical exciting.

Students also shared ways in which the camp has benefited them or will benefit them in the future. Students expressed that the camp has helped them to gain a better understanding of science subjects, which will help them prepare for their GCSEs. Various students said that their confidence in their science skills has improved as a result of the camp. Students also expressed that they had gained teamwork skills. Some students said attending the camp helped them finalise a decision on their future career or that it had changed their views on STEM and STEM related jobs.

Students provided valuable feedback and gave recommendations on how the camp could be improved. Many students expressed they would have liked the camp to last longer and have multiple days on one subject. Students also recommended making the camp more interactive and having more in-depth practicals. Some students expressed they would have liked the inclusion of engineering, more physics content, and greater detail in chemistry, biology, and physics beyond GCSE material.

Students praised the experience they have gained from the camp:

"The past week has made me even more determined to choose a career in STEM. #girlsinstem"

"This week has made me realise I want to take up a job in a STEM related career."

"Entertaining, inspiring and knowledgeable. I would 100% do this again."

Teacher feedback

Teachers provided valuable feedback and gave recommendations on how the camp could be improved. They expressed that they found the days too long and suggested that the camp could have two sessions a day for two groups, so more students could attend. Teachers also expressed they would have liked more interactive activities during some sessions and have less written based activities during the chemistry session, as it slowed the pace of the session.

Teachers were asked what the most useful part of the camp was for them. They felt that the physics and computer sessions were useful as the students thoroughly enjoyed them. Teachers also said that watching a specialist teach GCSE topics using practicals to engage students with the content was useful.

While only a relatively small number of teachers completed the surveys, feedback from them in the post-camp survey was positive across the board. All teachers who responded agreed or strongly agreed they have the confidence in their subject knowledge and pedagogical knowledge required for subjects they teach, both within and outside of their specialism.

After the camp, all teachers agreed that they believe the students who attended the camps are capable of doing well in their science GCSEs and all teachers agreed the students believe jobs and/or further study linked to STEM are a realistic option for them. All teachers strongly agreed the camp was well organised and planned. Additionally, all teachers agreed the camp will help to prepare the students for their studies in the upcoming academic year and the camp covered topics which will help the students to succeed in their GCSEs.

Feedback provided by other teachers involved with the camp who did not complete the survey was also highly positive:

Technician:

"This week will be life changing for the students. This week has also enabled me to learn how to carry out different types of practicals for topics which students struggle with."

Headteacher:

"We cannot express enough gratitude to STEM Learning. Their dedication to fostering hands-on learning experiences has truly enriched our students' educational journey, opening doors to a world of endless possibilities. We feel honoured to have been selected to participate and we look forward to the next camp."

Director of Science:

"I am deeply grateful to STEM Learning for generously providing our school with a week of captivating and hands-on practicals. This invaluable opportunity has ignited a spark of curiosity within our students, allowing them to explore the wonders of science in a truly engaging and memorable way. STEM Learning has not only enriched our curriculum but has also empowered our students to become enthusiastic problem solvers, critical thinkers, and future innovators."

Feedback from Victory Academy

Victory Academy, a secondary school in Chatham, Kent, which hosted an intensive STEM Camp, provided insightful data showcasing the impact on students' attainment after the camp. Among the 20 students who attended the camp, the school reported that 45% improved their grade significantly compared with their last exam. Additionally, 55% moved from working below their expected grade last year to above or at their expected grade and 20% are now working above their expected grade. Furthermore, the school has reported that students' career ambitions were impacted by the camp. Some students are now interested in taking engineering as a sixth form course or apprenticeship and A level physics. None of the school's students had pursued A level physics in the previous five years, and Victory Academy is now considering offering A level physics at the Sixth Form due to a growing interest in the subject.