I'm a Scientist,
Get me out of here

CERN Zone 2022–24 Evaluation Report

February 2025

MangorollaCIC

Science and Technology Facilities Council

Background

I'm a Scientist, Get me out of here **(IAS, imascientist.org.uk) is an online, student-led, public engagement project that gives school students across the UK real interactions with scientists and other STEM professionals.**

Scientists create profiles on the website and engage directly with school students through answering posted questions, and in real-time, text-based chats. Students ask questions about whatever they want; questions about careers, research, as well as their wider interests and lives outside of work.

Through taking part, students engage with STEM professionals from a diverse range of backgrounds, disciplines, and industries. They get to see scientists as ordinary people with hobbies, interests, pets, and families. They learn about STEM careers and opportunities in higher education, while seeing how what they learn in school relates to the world around them.

Between 2022 and 2024 the Science and Technology Facilities Council (STFC, ukri.org/councils/stfc/) provided funding for the CERN Zone to engage students with modern physics. The activity gave school students an exclusive peek behind the scenes of CERN facilities, and opportunity to connect with the scientists at the heart of nuclear physics experiments.

Students could:

- Go behind the scenes of cutting-edge physics experiments with live online tours of facilities
- Get real-time updates from the research projects taking place in CERN facilities
- Dip into regular chats with scientists and ask follow-up questions
- Embed their learning by completing the termly quiz
- Deepen their understanding of modern physics

Contents

Summary of objectives, outcomes, and learning

Objective	Outcome	Learning
500 6th form students actively engage with the project participating in chats from 50 schools. - 80% report greater understanding of particle physics - 80% report increased motivation to study physics at HE - 50% report inclusion of project on their UCAS form	533 students from 40 schools logged into the site. 245 actively engaged through joining chats or asking questions. Students responding to the feedback survey reported: - 94% were inspired to find out more about physics - 89% had a better understanding of how modern physics is done - 94% had a better understanding of the purpose of CERN as a research facility - 71% were more likely to consider university or higher education - 76% would use the activity to showcase motivation on their UCAS application Teachers responding to the feedback survey found the activity to be effective across all aspects of supporting student learning, developing attitudes and motivations, and improving careers awareness.	*Intended student outcomes were met, though sample size was small.* *The overall numbers of students and schools were not far off our expectations, but we did find the students considerably less active compared with our usual programme.* *The reasons for this may include:* • *KS5 classes are smaller and students felt more self-conscious about asking questions* • *The video Live Tours were a popular feature. However students are more likely to be a passive consumer of a video feed than an active participant in the accompanying conversation.* *We had 160 teachers sign up for the activity, but only 25% actually had students register.* *Anecdotally, teachers felt that over recent years their students were finding it increasingly hard to work independently.*

10 research teams with 5 scientists each participate - 70% report improvement in communication and engagement skills - 60% report increased confidence and motivation to do more public engagement	5 research teams participated with 30 actively participating researchers.	*We were naive at the outset to think that we could find 10 teams. In hindsight, 5 teams was a reasonable number.* *Survey response was not sufficient to analyse.*
Adaption and configuration of IAS zone to host the teams and facilitate interaction	CERN Zone created at: cern22.imascientist.org.uk/ Zone included a reconfigured format to facilitate research teams, and team updates; as well as a new design theme.	
Moderation of ~40 fortnightly open chats and 20 teacher booked chats	30 chats took place with 6 additional chats where students did not attend. 13 chats were open chats, 17 were teacher booked chats.	*Running open chats requires a balance between giving as much opportunity as possible for students to engage and wasting the time of our volunteer scientists.* *As mentioned above it became increasingly clear that even KS5 students were reluctant to study independently.* *We chose to reduce the number of open chats to avoid wasting the time and goodwill of scientists and to provide more focus on fewer chats.*
Curation and publishing of ~50 updates from research teams	Research teams published 8 updates: cern22.imascientist.org.uk/team-updates/	*Our vision was for teams to provide an informal termly update each.* *Our vision did not match the CERN culture.*
Creation of 6 quizzes	A quiz was created each term	

Hosting and maintenance of site for project duration and at least 3 years after	Site to be maintained until at least 2027	
Full evaluation report to be produced at the end of the project	This report comprises our evaluation	*This report had intended to include a significant section using data collected in interviews. Unfortunately between fieldwork and analysis our evaluator was taken ill and has not returned to work.* *We will review our process in future to ensure data collected during the fieldwork stage is held in a store to which we have access.*

Participants and activity

Summary of activity

Participating research teams	5
Actively participating researchers	30
Schools	40
Students logged in	533
Students active[1]	245 (46%)
Estimated true number of students engaged [2]	343
Chats took place[3]	30
Lines of chat	3,704
Average lines per chat	123
Follow up questions asked	39
Follow up questions approved	38
Answers to follow up questions	80
Comments	5

[1] % of students logged in who actively engaged in chats, asked a follow up question, or posted a comment.
[2] Many students share computers or tablets, or classes take part asking all of their questions through a single teacher's account; the estimated true number of students engaged is the students engaged (i.e. student accounts active in a chat) multiplied by 1.4
[3] Additionally, 6 chats were opened where the school did not attend

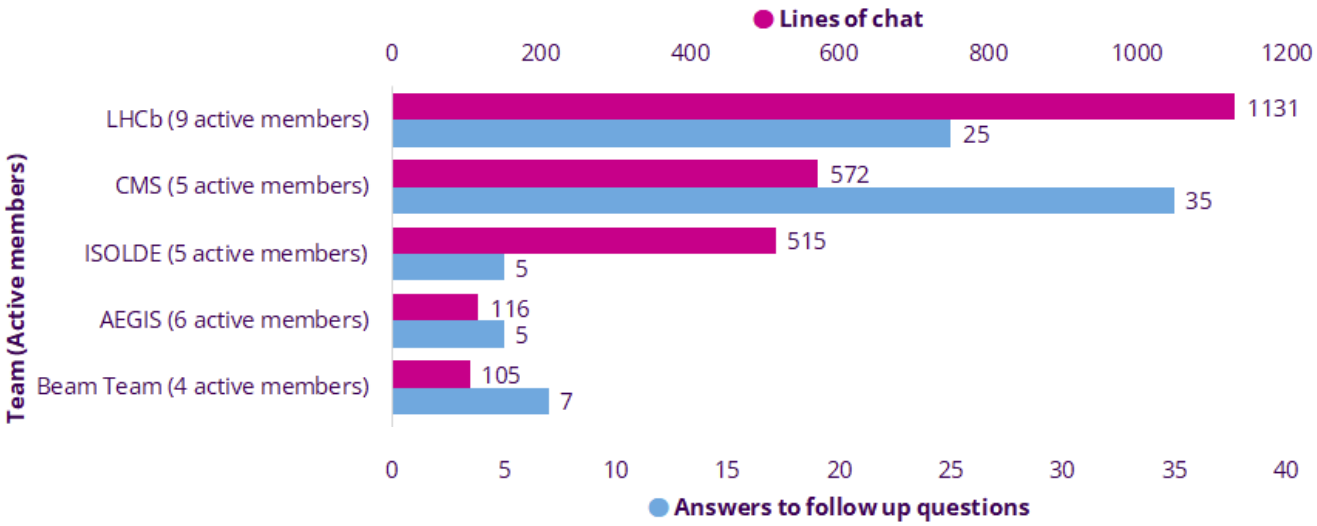
Research teams

The teams

AEGIS	CMS
The Antihydrogen Experiment: Gravity, Interferometry, Spectroscopy (AEGIS) team are working on one of the experiments at the Antimatter Factory, researching the universal matter-antimatter imbalance.	The Compact Muon Solenoid (CMS) detector uses a huge solenoid magnet to bend the paths of particles from collisions in the Large Hadron Collider.
ISOLDE	**LHCb**
The Isotope mass Separator On-Line facility (ISOLDE) team are dedicated to the production of a large variety of radioactive ion beams for different experiments.	The Large Hadron Collider beauty (LHCb) experiment specialises in investigating the slight differences between matter and antimatter by studying a type of particle called the "beauty quark", or "b quark".
Beam Team	
The Beam Team is responsible for studying and understanding the different beams (proton, electron, ion etc.) for all of CERN's accelerators.	

Activity

The LHCb team was the most active in chats with 9 members writing 1,131 lines. The CMS team was most active answering follow up questions with 5 members writing 35 answers.



Schools

245 students from 40 schools actively took part in the CERN Zone. We estimate that the true number of students engaged is closer to 343 when accounting for students sharing computers or classes where the teacher account was used to ask questions on behalf of the students.

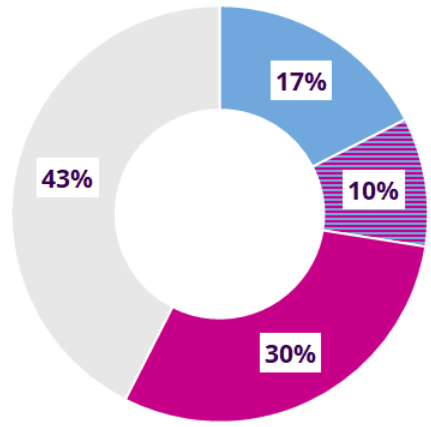
Participating priority schools

We prioritise opportunities for widening participation (WP) schools[4], and schools distant from major research HEIs[5]. Teachers at these schools are offered additional support, and earlier booking for chats.[6]

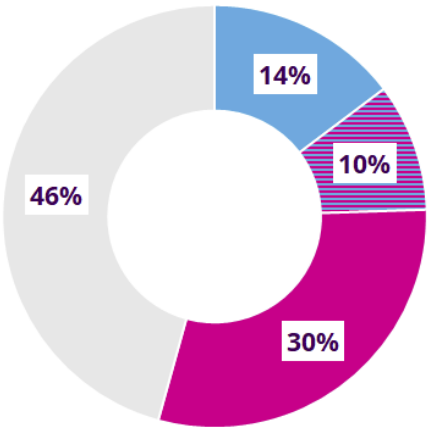
57% of participating schools and 54% of active students were from priority schools:

- 27% of participating schools and 24% of active students were from widening participation schools
- 40% of participating schools and active students were distant from HEIs

Proportion of participating schools by priority type



Proportion of active students by school priority type



Schools with high WP quintiles
Schools distant from HEIs with high WP quintiles
Schools distant from HEIs
Non-priority schools

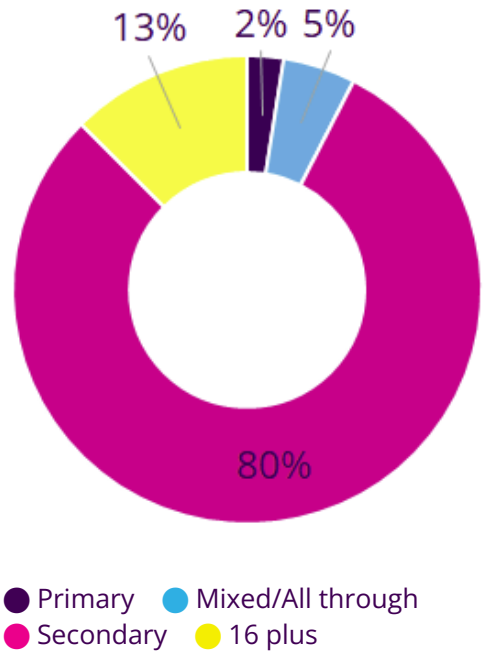
[4] We define a priority widening participation school as one with a high proportion of students (quintiles 4 and 5) receiving Free School Meals, or Pupil Premium; or living in the most deprived areas in the Scottish Index of Multiple Deprivation (SIMD). Additionally, FE colleges, SEND schools, and PRUs are considered priority schools.

[5] Schools more than 30 minutes from their nearest major research HEI are half as likely to receive a visit from a scientist as those within 15 minutes travel time. State schools more than 30 minutes from a HEI are priority distant schools. See: about.imascientist.org.uk/2017/school-engagement-in-stem-enrichment-effect-of-school-location/

[6] Read more about how we prioritise schools: about.imascientist.org.uk/widening-participation-prioritising-places-for-schools/

School phase

80% of schools participating in the CERN Zone were secondary schools (including schools with sixth forms); 13% were Post-16 institutions.



Locations of participating schools

Map: Locations of participating schools
[Map data and imagery: ©2025 TerraMetrics]

Chats

Common discussion topics

The image below shows common words used in chats. Size of the word is proportional to frequency of use (colour has no relevance).

Examples of great engagement

In this chat Mei — on the CMS team — answered a student's question about applications of coding in physics.

Student: Do you enjoy coding?

> **Mei:** Yes I very much do! One of the reasons I decided to stick with particle physics as it can involve a lot of it!

> **Student:** I like to code as well! I use Python :D

> **Mei:** Amazing, it's so useful! :-D and if you know one language, it's quite easy to learn another!

Teacher: Thank you so much for your time. This has been really interesting

In this chat Kay — part of the Beam team — answered a student's question about how the collider works:

Teacher: One of my students just asked if the crystals you work with are part of the collider or the detector?

> **Kay:** The crystals are part of the collider. The crystal structure has atoms in planes/sheets. The particles get trapped between the planes and follow the shape of the crystal.

> **Kay:** You can think of it like a river following the valley between two mountain ranges.

> **Kay:** If we bend the crystal (we use clamps to do this) then the particles will naturally follow the bend.

In this chat, a student garnered answers and opinions from scientists across a range of teams at CERN:

Student: Thank you for the insight :)

Student: Is there a language barrier at CERN at all, being an international institution? If so, how is this managed?

Jonathan: If you speak English generally you'll be fine :)

Jonathan: All meetings take place in English - It's kind of the common language between all the different nationalities.

Mei: CERN has two official languages: English and French. My French is awful, but just English was fine! (Except for one time when the security guard who only spoke French wouldn't let me in...)

Mary: French and English are the main languages spoken at CERN. Some French may be helpful in the cafeterias but all of my meetings as a physicist are in English!

Benji: Some French is also quite useful, since many of the non-scientist staff are locals

Jonathan: I know some UK PhD students out here that hardly speak a word of French, though

Mary: Living here I have to speak some French in the shops, but this is something you can pick up with little practice too. If you are a PhD student, some UK institutions will even pay for your French lessons if you want them!

Student: What kind of software control does the CMS require? How does the software choose which collisions are more 'interesting' than others?

Mei: Triggers, choose which events we keep or not. At CMS we have two triggers: the first one is in hardware and the second was in software. We start with a rough selection in hardware because it is quicker.

Mei: The software trigger is slower, but more precise, and can filter out more 'uninteresting' events

Mei: interesting events tend to involve a lot of energy, so the triggers can for example quickly calculate the total energy of the particles created, and if its high enough we trigger and send the collision to the next step

Mei: there are also other things we can trigger on, e.g. if we detect any muons. Since we collide protons, something interesting has probably happened if we see any muons in our muon detectors

Further resources

Facility tours

These were live tours of the team's facilities at CERN. A team member would live stream themselves going around the offices where they worked, control rooms, going down into the cavern. They'd talk through the equipment they had to wear, what the machines were doing and some of the physics behind it. This was streamed through to the chat where other team members would be. Students would ask questions that they had during the tour and members would give text-based replies.

Read summaries and watch recordings of the facility tours:
cern22.imascientist.org.uk/tag/tour/

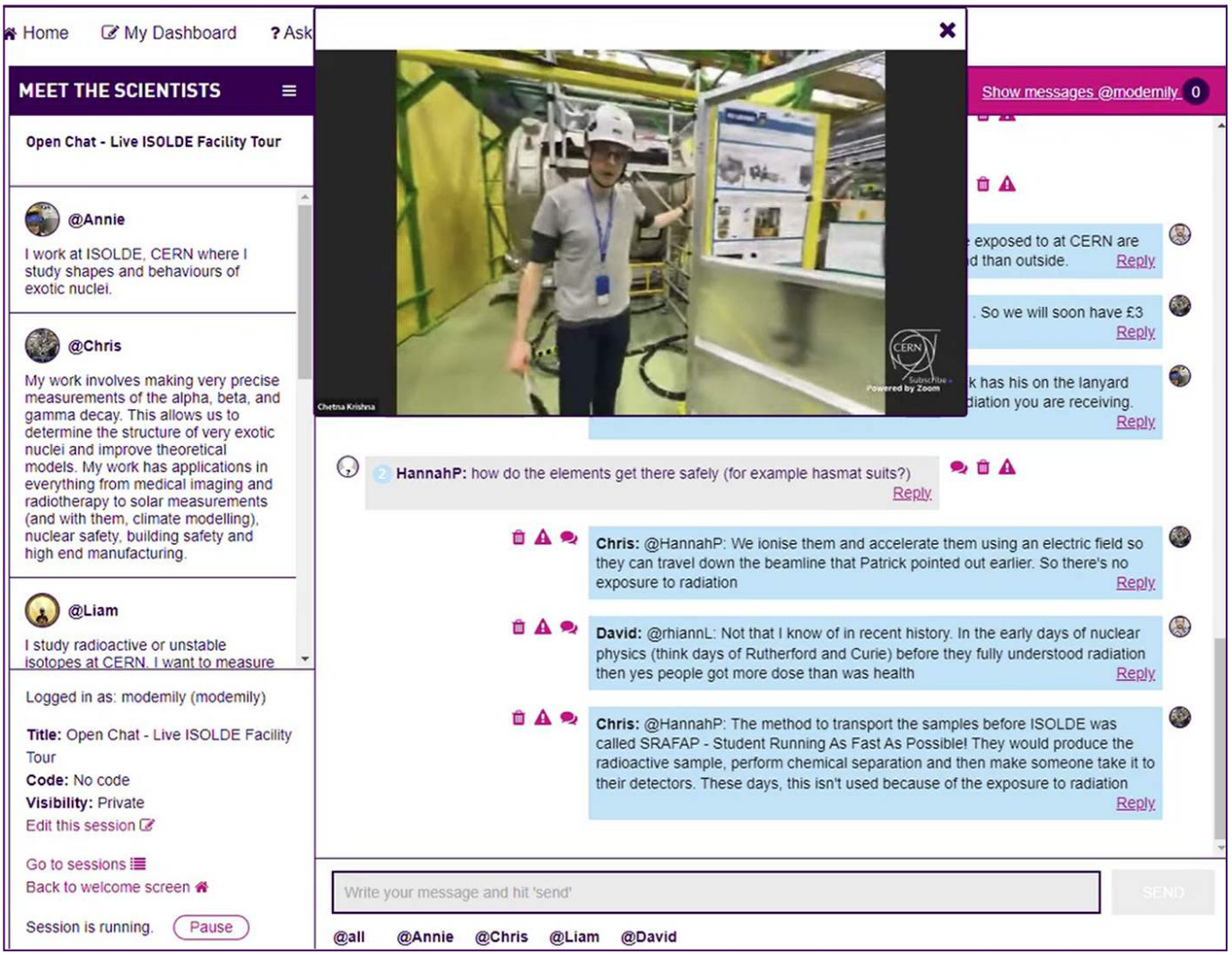


Image: *ISOLDE facility tour live stream and chat, watch the recording of the live stream: cern22.imascientist.org.uk/2024/03/07/isolde-tour/*

Team updates

Teams were invited to share short updates with the students on what they were working on; the idea was to give students an understanding of the day-to-day workings of the teams, and provide insight into how modern physics is done.

At the outset we were hoping for teams to provide regular updates around once per term. We envisaged a lablog format commenting on what the team had been working on even if it was not publishable academic work.

It is fair to say that the teams did not share our enthusiasm for this aspect of the activity. There is a sense that the scientists are not used to writing about their work except as formal published articles when results are analysed and work completed.

Read the team updates:
cern22.imascientist.org.uk/tag/team-update/

Student quizzes

Each term a new quiz was made available for students. Students needed to use information from the CERN Zone to answer the questions; information from team pages, scientists' profiles, and team updates.

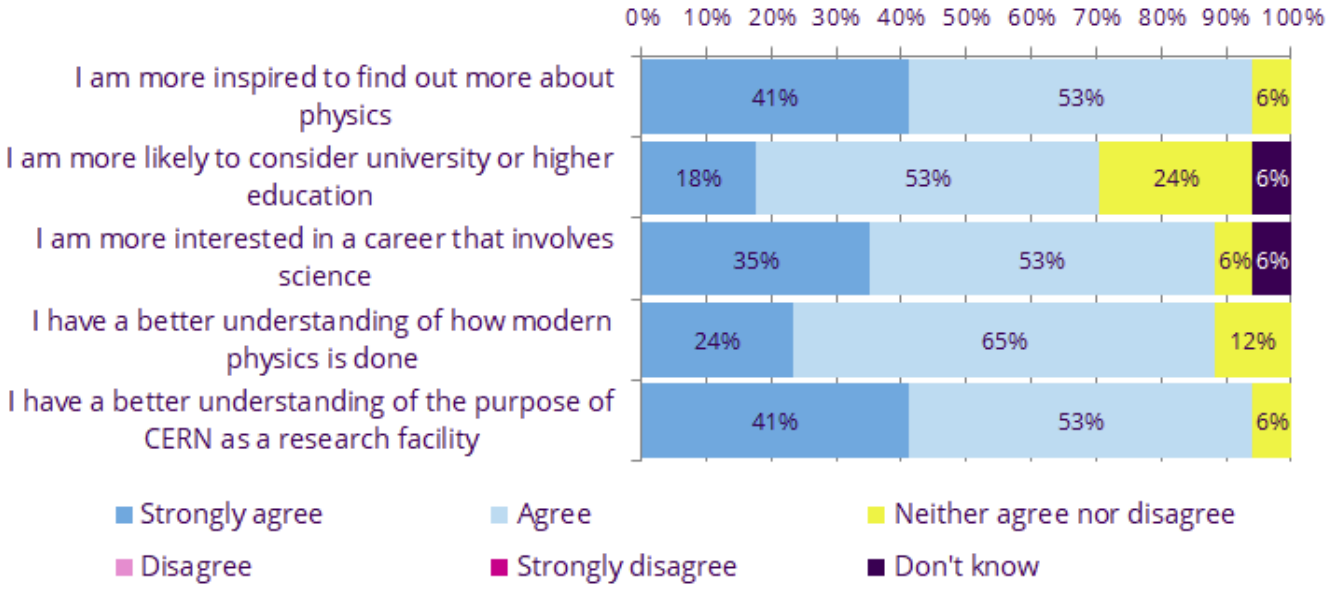
The winner of the quiz received a £20 Waterstones voucher.

Feedback

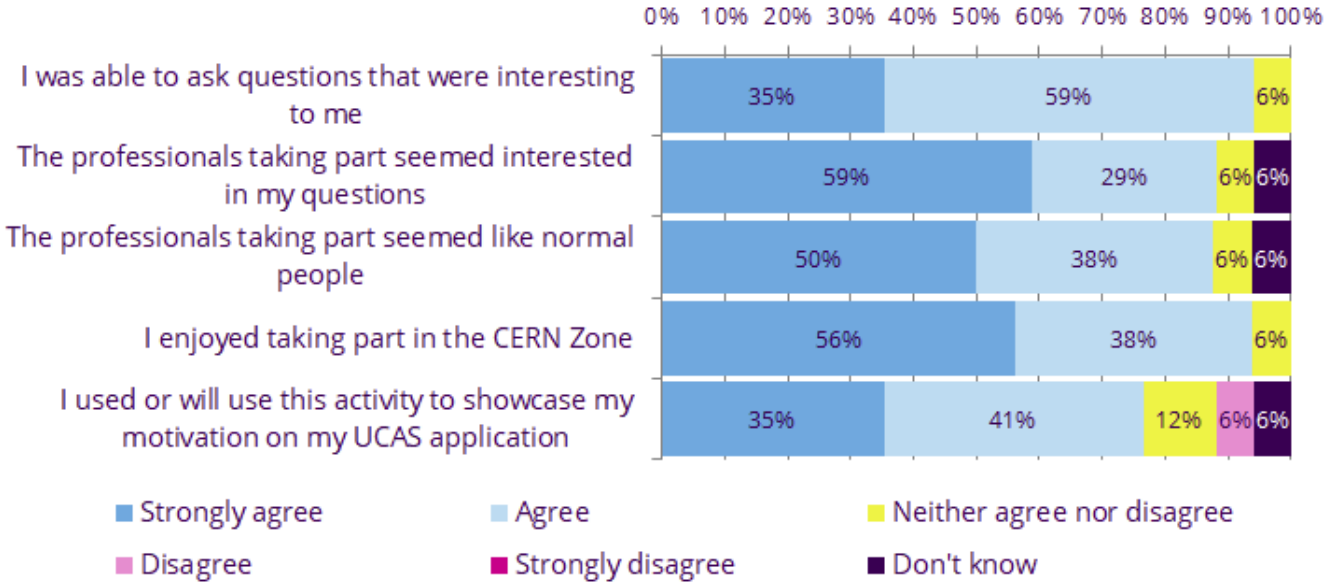
Student survey

The majority of students responding to the feedback survey (n=18), felt that the activity was positive across all the metrics measured against.

Compared to how you felt before taking part in the CERN Zone, how much do you agree or disagree with the following statements?



How much do you agree or disagree with the following statements?



Additional feedback

Teacher feedback

5 teachers completed the post-activity feedback survey. Teachers were asked how effective they found the activity across a range of areas including student learning, attitudes and motivations, and careers awareness. Feedback was positive across all areas.

Student learning • Supporting independent learning • Supporting student learning about physics • Supporting student learning about how modern physics is done and the purpose of CERN as a research facility • Improving students' confidence in asking questions about STEM	All teachers rated the activity either '**Extremely effective**' or '**Very effective**' across all areas.
Attitudes and motivations • Improving students' motivations towards STEM • Helping students see how STEM relates to the world around them • Challenging students' stereotypes about scientists and STEM professionals	All teachers found the activity to be '**Extremely'** or '**Very effective**' regarding improving motivations and STEM relating to the world around them. 1 teacher found the activity **'Moderately effective'** for challenging stereotypes, with others reporting it to be either '**Extremely'** or '**Very effective'**.
Careers awareness • Developing students' awareness of STEM careers • Developing students' awareness that STEM qualifications can be useful even if you don't want to be a scientist • Improving students' understanding of the steps to becoming a scientist	For awareness of STEM careers, all 5 found the activity **'Extremely'** or **'Very effective'** For awareness of use of STEM qualifications, 1 teacher found the activity '**Moderately effective'**, with all others reporting it to be **'Extremely'** or '**Extremely effective**' or '**Very** . 1 of 4 teachers found the activity **'Moderately effective'** for improving understanding of steps to becoming a scientist, with all others reporting it to be **'Extremely'** or **'Very effective'** (1 teacher did not answer).

Researcher feedback

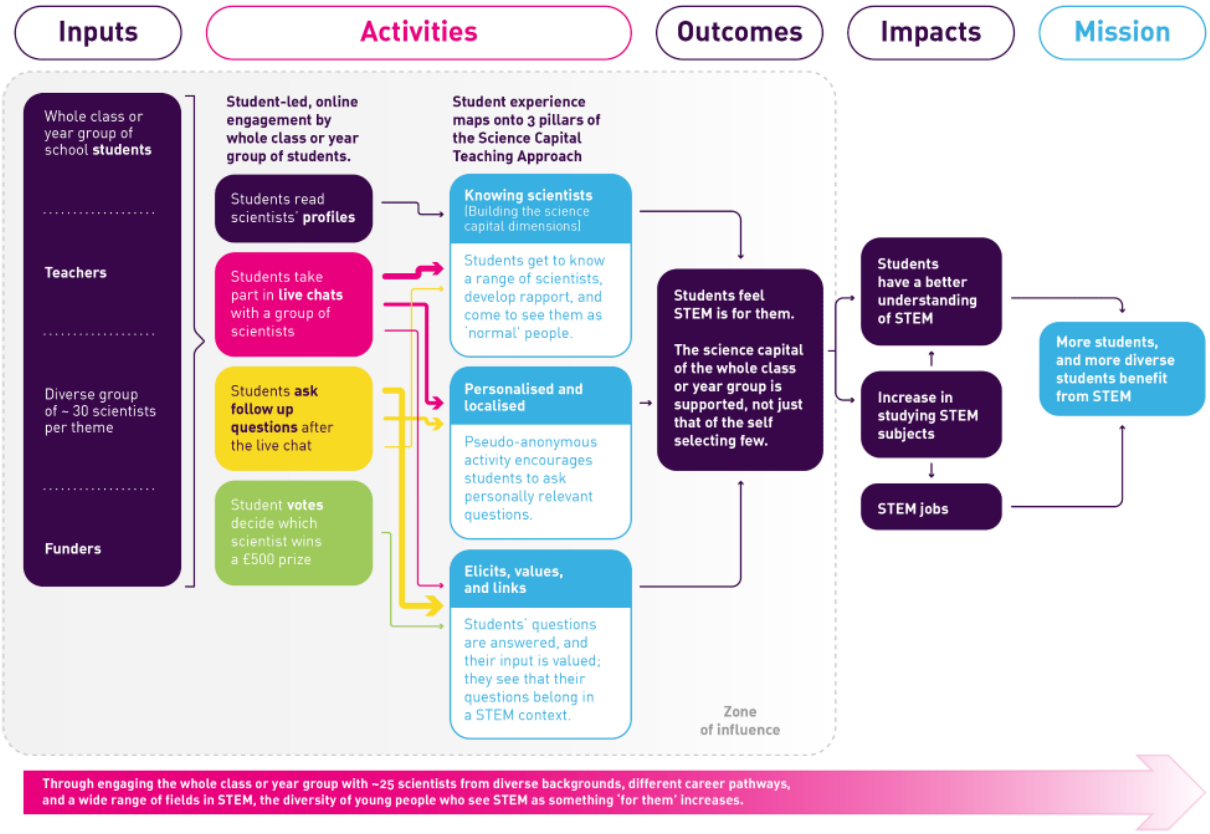
The only other public engagement I regularly take part in is guiding visitors at CERN. From the participants' perspective I feel like the CERN Zone chats were better, because the kids seemed more likely to ask questions compared to the live tours I do, where I often get high school groups, but I feel the kids are too shy to ask something in front of everyone else.

From my own perspective, I'd feel I can engage more with a live audience (provided they are also willing to discuss), and I found it often a bit hectic to try to reply to all the relevant questions in enough detail to be understandable, but not too long so I can answer all questions relatively soon after they were asked.

Researcher, Feedback survey

Supporting science capital

Theory of Change



Read our Theory of Change in more detail: about.imascientist.org.uk/theoryofchange/

I'm a Scientist, Supporting Science Capital

In 2019 Jen DeWitt, PhD, an independent research and evaluation consultant, and member of the core team developing and applying the concept of science capital, conducted an evaluation of IAS to see how the experience might support students' science capital.

The research comprised student focus groups, teacher interviews, surveys and analysis of content generated on the IAS site including transcripts of live chats and questions asked by students.

The evidence produced by this research demonstrates that the experience of IAS maps onto elements of the Science Capital Teaching Approach. In turn, this supports science capital-related outcomes of participating in IAS.

The research discussed in the following section applies to the IAS project as a whole.

Read the full report (PDF):
about.imascientist.org.uk/files/2019/11/IAS-Science-Capital-Main-Report-Sep-2019.pdf

Background: Science capital

Science capital[7] is a set of resources that helps individuals engage and identify with science. Young people with higher levels of science capital are more likely to see science as 'for me' and to choose to study science subjects at a higher level.

The Science Capital Teaching Approach (Godec, King, & Archer, 2017)[8] aims to enhance young people's engagement with science, supporting them in seeing science as relevant to their lives and 'for me'.

The foundation of this approach involves broadening what counts in the science classroom: creating a learning environment where all students feel able to offer contributions from their own experiences and interests. The approach also consists of three main pillars:

1. **Personalising and localising:** Going beyond contextualising, to connect to the actual experiences, understandings, attitudes and interests of young people.
2. **Eliciting-valuing-linking:** Inviting students to share knowledge, attitudes and experiences; recognising these as having value; and connecting this back to the science.
3. **Building the dimensions of science capital:** Considering the eight dimensions when developing activities, lessons or programmes.

Supporting science capital

The research found evidence that IAS provides support for four of the science capital 'dimensions':

- **Science literacy** (Dimension 1)
- **Seeing science as relevant to everyday life** (Dimension 2)
- **Knowledge about the transferability of science/science qualifications** (Dimension 3)
- **Knowing people in science-related jobs** (Dimension 7)

Science literacy (Dimension 1)

By providing the opportunity to ask about science content, taking part in IAS contributes to science literacy.

Seeing science as relevant to everyday life (Dimension 2)

Because students can ask questions of interest to them personally, taking part in IAS can enhance science-related attitudes and values, helping students to see science as relevant to their everyday lives.

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[7] ucl.ac.uk/ioe/departments-and-centres/departments/education-practice-and-society/science-capital-research

[8] discovery.ucl.ac.uk/id/eprint/10080166/

Knowledge about the transferability of science (skills, knowledge, qualifications) (Dimension 3)

When students ask about qualifications, participation may improve their knowledge of the range of jobs that science can lead to.

Knowing people in science-related jobs (Dimension 7)

Most importantly, however, IAS provides an opportunity to get to know scientists — about the paths they took to their current work, about a range of aspects of their work (e.g. travel, teamwork) and about their lives outside of work. Students may even discover that scientists are not all 'super geniuses' — that they are normal individuals, albeit with interesting jobs.

In sum, IAS is personally relevant to students and their lives, elicits and values students' questions and experiences, and provides support for building dimensions of science capital. Together, its various elements create an environment in which students are able to contribute from their own interests and experiences.

Consequently, through participating in IAS, students can come to see science as personally relevant to them and to appreciate that scientists are 'normal people'. Moreover, ultimately it is the participating students who are in control — it is their votes that determine the winner.

This environment, we believe, reinforces that the arena of *I'm a Scientist* is one in which it is students' valued and valuable opinions that count the most. Together, then, the elements of IAS can support students' science capital, meaning IAS has an important role in helping young people see that science just might be 'for me' which, in turn, can contribute to nurturing science aspirations.

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