I'm a Scientist,
Get me out of here:

2022 RSC Zones Activity Report

December 2022

Mangorolla CIC

ROYAL SOCIETY OF CHEMISTRY

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 authentic interactions with scientists and other STEM professionals.**

Scientists create profiles on the website and engage directly with school students through real-time, text-based chats and answering post-chat follow-up questions. 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 chemists from a diverse range of backgrounds, 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.

In 2022 the Royal Society of Chemistry (RSC, rsc.org) directly part-funded 3 IAS Zones to engage students with chemists and members of the RSC participated in a further 4 Zones. This report is a summary of the activity in, and the impact of those Zones.

Contents

Summary

- **Throughout 2022, RSC members participated in 7 out of 12 Zones across the IAS platforms, 3 of which were directly part-funded by the RSC**

- **4,550 students logged in to connect with scientists in the 7 Zones**
    - RSC members took part in a total of 123 live Chat sessions
    - 83 unique schools took part
    - 69% of participating UK schools were priority schools
    - 3,504 students were active across the 7 Zones

- **Students from 66 school interacted directly with RSC members**

- **46 reported[1] RSC members took part:**
    - Representing a wide range of scientists' backgrounds provided students with insight into different careers, fields and routes into chemistry

- **Taking part has a positive impact on participating scientists:**
    - 74% of respondents reported an increase in skill in communicating with lay people.
    - 77% of scientists felt their enthusiasm for communicating with lay audiences increased.

- **Taking part in IAS supports students' science capital:**
    - IAS maps well onto the Science Capital Teaching Approach, supporting science capital dimensions including: *science literacy, seeing science as relevant to everyday life, knowledge about the transferability of science/science qualifications, and especially, knowing people in science-related jobs.*

[1] Participating scientists can disclose any organisations to which they belong when they sign up to take part. However they are not obliged to do so. Therefore, the number of RSC members could be higher.

Participants and activity

Summary of activity

RSC funded Zones

March 2022
Molecule Zone
RSC members: 23

May 2021
Great Science Share Zone
RSC members: 6

October 2021
Plastic Zone
RSC members: 8

Additional Zones with active RSC members in 2022

March 2022
Healthy World Zone
RSC members: 4
Helium Zone
RSC members: 3

November 2022
Energy Zone
RSC members: 1
Aluminium Zone (IE)
RSC members: 1

Key figures	Total	RSC funded Zones
Zones	7	3
Scientists	211	79
Reported RSC members	46	36
Schools	83	57
School in contact with RSC members	66	49
Students logged in	4,550	2,139

Active students[2]	3,504	1,720
Live Chats	221	105
Live Chats with RSC members	123	87
Lines of live Chat	66,067	34,372
'Ask' questions asked	1,933	846
'Ask' questions approved[3]	745	427
'Ask' answers given	1,785	963
Votes[4]	1,683	803

The figures in the above table do not include the most current Zones.

Zone reports

Zone reports summarise activity data, show examples of good engagement, and preliminary feedback.

These are published following each event and are available online: [https://about.imascientist.org.uk/category/zone-reports/]

[2] 77% of students actively engaged through asking a question, taking part in a live chat, casting a vote, or posting a comment.

[3] Excludes duplicated questions

[4] Not all Zones included voting

Participating schools

4,550 students from 83 different schools logged in over the seven Zones in 2022. Students from 66 schools interacted directly with RSC members in live Chats.

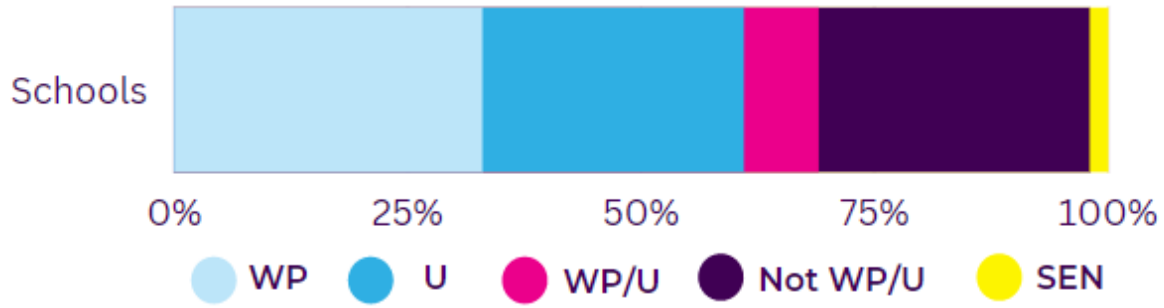
77% of students actively engaged by joining a discussion, asking a question, posting a comment, or casting a vote.

The map below shows the locations of participating schools across the UK.

Underserved and widening participation schools

We work to prioritise schools in geographically underserved areas and widening participation schools.[5]

69% of participating UK schools were underserved or widening participation schools.



36% of participating UK schools were located more than 30 minutes from major research HEI (underserved locations). Our research shows that these schools are half as likely to get a visit from a university scientist than schools within 15 minutes of a HEI.[6] Taking part in IAS gives students at these schools access to researchers and other scientists.

41% of participating UK schools were widening participation schools.

[5] Widening participation schools are counted as those with above average percentage of students eligible for free school meals (currently more than 14%); or in Scotland, where more than 20% of pupils live in the 20% most deprived datazones. Underserved schools are those more than 30 minutes drive from a major research HEI. Read more: about.imascientist.org.uk/under-served-and-wp/

[6] imascientist.org.uk/distance

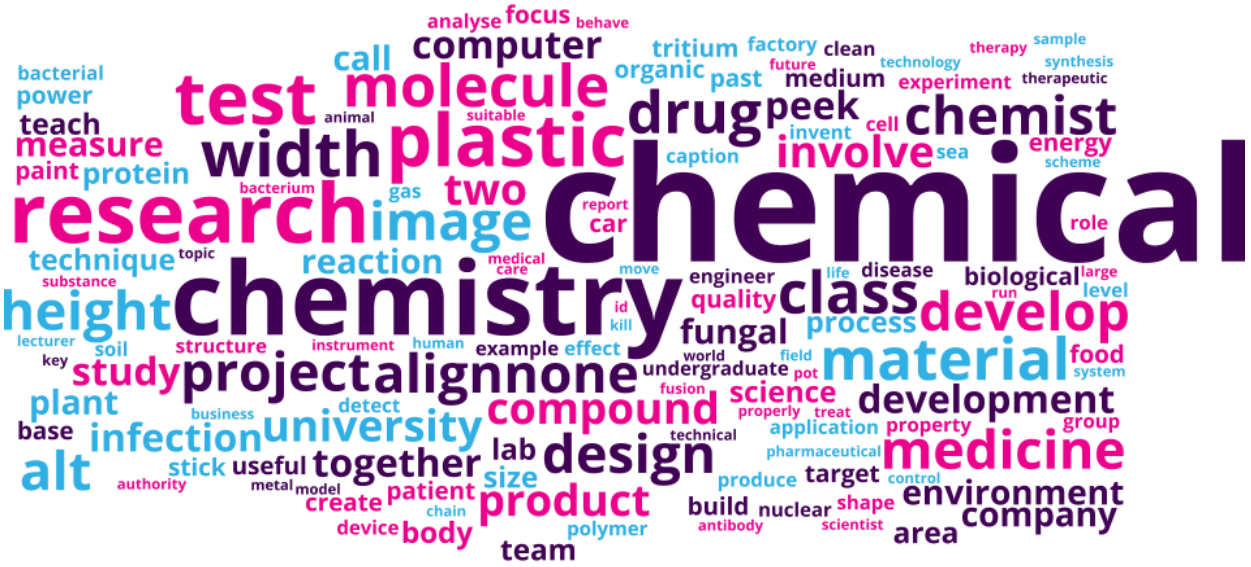
Participating scientists

In total, 46 RSC members took part in 7 Zones across 2022. A further 16 RSC members were invited to take part but didn't.

Scientists from UK-based institutions and universities took part. Scientists represented a wide range of areas within chemistry, allowing students a greater insight into potential careers.

The map (right) shows the locations of members of the RSC that participated.

The word cloud created out of the work summaries written by participating RSC members highlighted the diversity of careers and fields of work represented by RSC members.



Student and Scientist interaction

Words used in live chats

Common words used by students and scientists

The images below show common words used in live chats. Size of the word is proportional to frequency of use.

Conversations in live chats

Student: What is your favourite element and why?

Scientist: *Carbon - it makes up all the living things on our planet!*

Student: Are we all made up of carbon?

Scientist: *Yes! Oxygen, carbon, hydrogen and nitrogen mainly*

Student: If we are made up of so many gases, how come we are solid?

Scientist: *Because when they bond together they aren't gases anymore. Water is one oxygen and two hydrogen. Both gases on their own, but together they're liquid (between 1-99*C)*

Student: What will have the biggest impact: general public changing plastic use or industry changing use?

Scientist: *Great question! I think in the short term, we as consumers can have a massive impact by reusing as much as possible and recycling if necessary. More legislation is hopefully on the way to change industrial attitudes to plastics but this might be in the long term*

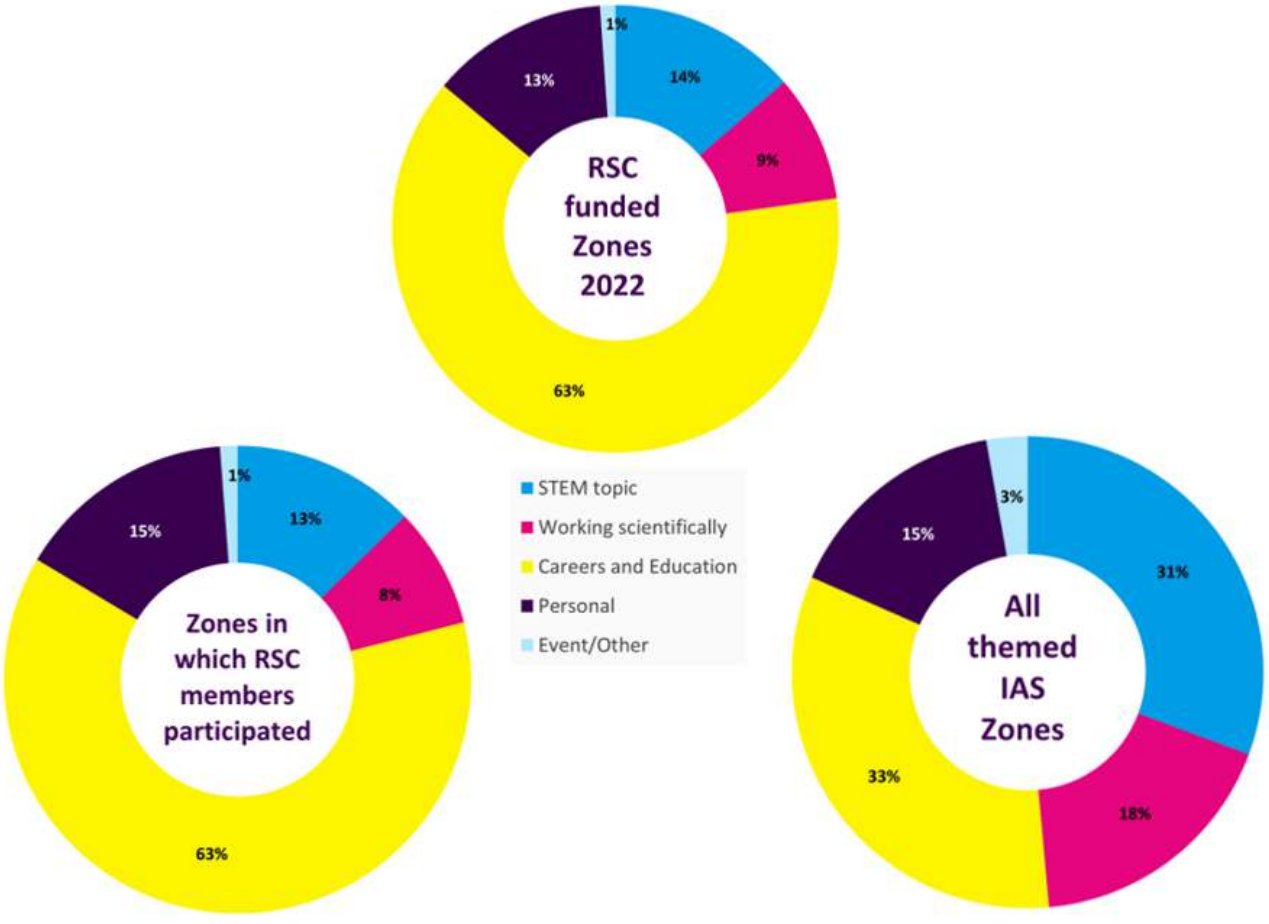
Scientist: *In industry, all your usage is in the same place, so you can gather waste/used product easily. Out in the public, plastic gets used all over the place*

Follow-up questions

Questions submitted by students are coded according to their theme. The charts below shows the proportion of questions in each theme.

Topics of questions asked in RSC funded Zones were consistent with other IAS themed Zones in 2022. Compared to previous IAS themed Zones, there was a bigger **focus on careers and education** this year.

Engagement with **chemistry topics** and careers was **present in both Ask and live Chats throughout 2022.**



Follow-up questions for RSC members

Questions can range from detailed subject-related questions to ones that support science capital by making science more relatable to everyday life.

Can science provide the answer to the energy crisis, if so how and what are the timescales? **— Student question**	
Where did Oxygen come from? **— Student question**	How do you synthesise uranium? **— Student question**
Why is plastic not biodegradable? **— Student question**	What universities did you go to and which would you recommend for future scientists? **— Student question**

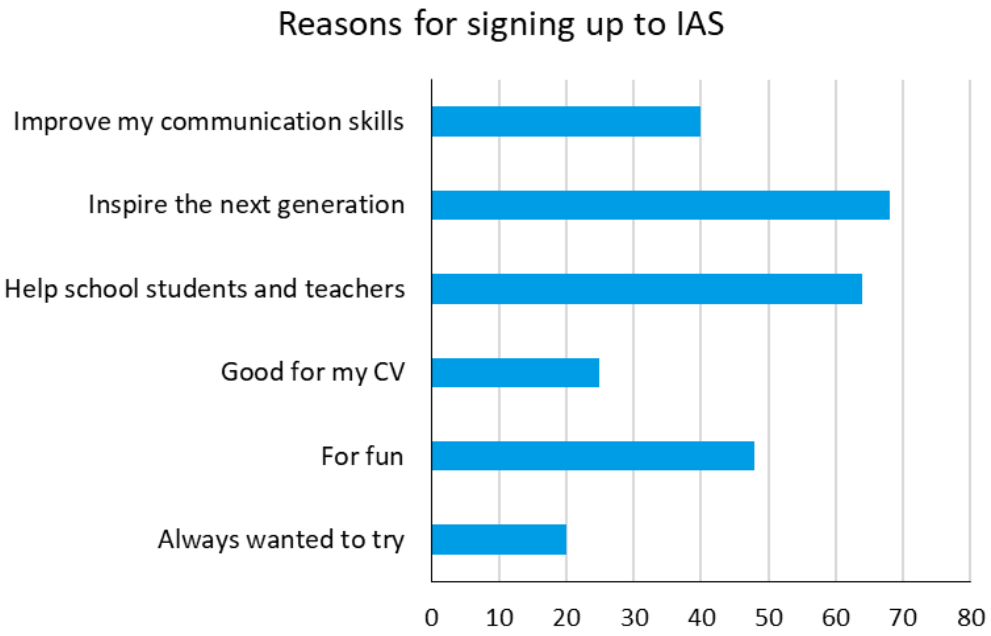
Impact

Scientists' feedback

The scientists who took part in Zones in 2022 were asked to complete a survey looking at the possible impacts of taking part in IAS.

Reason for signing up to IAS

68 out of 83 scientists signed up because they wanted to inspire the next generation. Scientists' responses are recorded in the graph below. Respondents were able to select more than one answer.



Communication skills, confidence, and enthusiasm for public engagement

Scientists were asked what, if any, impact taking part in IAS had on their skills, confidence, and enthusiasm for communicating research with lay people.

The majority of respondents reported an increase in their **skills, confidence** and **enthusiasm** towards public engagement and communicating with lay people.

- **74%** of respondents reported an increase in **skill in communicating with lay people**.

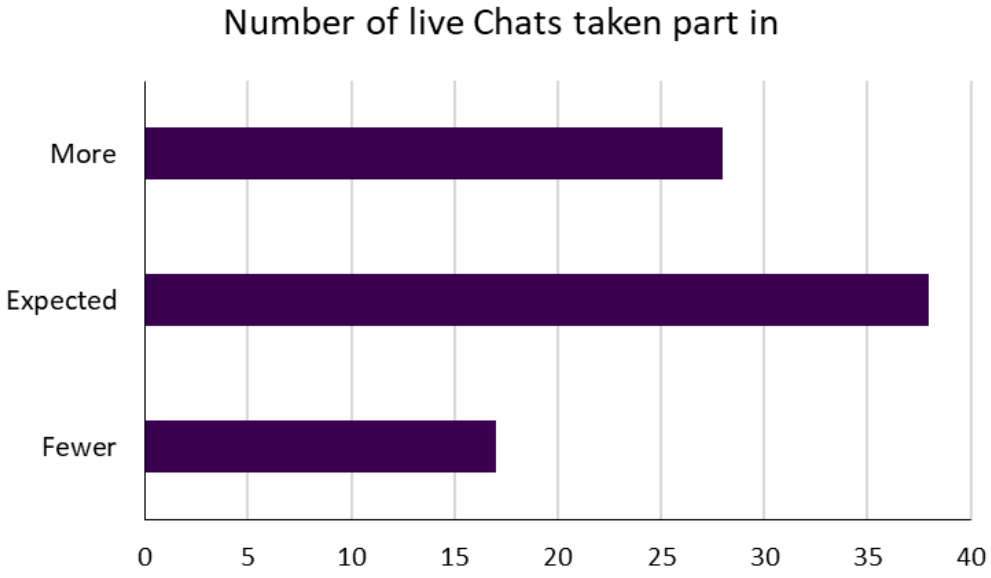
- **77%** of respondents felt an increased level of **enthusiasm for communicating with lay people.**
- **70%** of scientists felt as though their **confidence in communicating** with lay people increased.

I really enjoyed taking part in I'm a Scientist. I had a lot of fun talking to the students and answering their questions. I didn't quite know what to expect when I signed up, but I would 100% recommend taking part to other scientists.

— Hannah Howman, Scientist, Feedback survey

Participation in live Chats

Scientists taking part were asked about their participation and whether the amount of live Chats they took part in were, as expected, more, or fewer.



Further RSC members feedback

I had a great experience. Above all, I was happy to engage in a format that sidestepped the usual hyperbole and instead focused on humanising scientists as the normal (often quite boring) people that we are. Nothing says "you can do this too" better than that!

— Luke H., Scientist, Feedback survey

It was great fun - I hadn't anticipated how much fun it would be. Sometimes it was truly manic!! But always fun. I thoroughly enjoyed it and showcased it to colleagues who I am sure will sign up in future.

— Stephen Doughty, Scientist, Feedback survey

It was a meaningful experience, I wish more countries had these programmes to expand

outreach to students and the public about science

— Scientist, Feedback survey

Academy Zone

Alongside their assigned Zones all participating RSC members were invited to take part in the Academy Zone.

13 RSC members were given access to the Academy Zone throughout 2022:

- March 2022
    - All RSC members invited
    - 3 RSC members provided access
    - 2 completed the course by answering all 6 questions
- October 2022
    - 8 RSC members provided access
    - 3 participated, with 2 answering all 6 questions
- November 2022
    - 2 RSC members provided access

The Academy Zone is a short online course for STEM professionals to reflect on their experience in their IAS Zone and deepen their understanding and knowledge of public engagement practices.

Supporting Science Capital

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.

[7] ucl.ac.uk/ioe/departments-and-centres/departments/education-practice-and-society/science-capital-research
[8] discovery.ucl.ac.uk/id/eprint/10080166/

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.

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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