

June 2023

The Low Carbon Zone (lowcarbon23.imascientist.org.uk) ran from 5 to 30 June and was funded by Johnson Matthey's Science and Me Programme.

The Zone featured 39 scientists working within academia and industry; as technicians making parts for cars and lorries, as researchers looking at ways to improve renewable energy technology, as engineers creating solar powered cars and as chemists looking at precious metals and materials used in lots of everyday items. They connected with 729 students from across the UK. 95% of students actively participated by joining Chats, asking follow up questions, commenting and voting.

Key activity figures

	Zone	June 2023 average
Students logged in	729	493
Students active	95%	90%
Schools	24	16
Scientists given access	46	34
Scientists active	39	28
Chats booked	53	40
Chats took place	37	27
Lines of Chat	11,879	6,966
Average lines per Chat	321	233
Follow up questions asked	286	155
Follow up questions approved	208	120
Answers given to follow up questions	618	343
Scientist comments	25	17
Student comments	6	2
Votes	551	345

Who took part?

729 students from 24 schools across the UK logged into the Zone and connected with 39 scientists.

95% of active students were from priority schools: 75% from underserved schools and 59% from widening participation schools.

A total of 551 votes were cast by students. The winning scientist with the most student votes was John Grasmeder, a chemist working on materials used in smartphones, cars, aeroplanes and human bodies!

Activity

53 Chats were booked. 37 took place.

Out of the remaining 16 Chats booked, 10 were cancelled and in 6 cases, the school did not attend and did not give notice. All schools were chased and invited to rebook.

There were 5 Chats where the teacher asked questions on behalf of their students. It is also common for students to share login details or computers during Chats. Therefore, the number of students engaged is expected to be higher.

Students asked 286 follow up questions of which 208 were approved and sent to scientists. Duplicate questions (that scientists had already answered) were not sent again, with the student being directed to the previous answer and invited to comment and ask additional questions.

School activity

Students from 24 schools across the UK participated in the Zone.

School	Active users	Chats attended	Chat lines (total)	Chat lines (per user)	Follow up questions approved	Votes
The National Junior School, Lincolnshire (WP/U)	166	9	1,958	12	18	124
Woodhouse Academy, Staffordshire (U)	133	6	1,452	11	26	106
Dr Thomlinson Church of England Middle School, Northumberland (U)	51	2	463	9	5	44
St Dominic's High School, Antrim (WP)	50	2	230	5	37	30
Victoria Primary School, Edinburgh City (WP)	44	1	585	13	13	35
Livingstone Academy, Bournemouth (WP/U)	43	2	393	9	8	38
Summerhill School, West Midlands (U)	30	1	200	7	1	28
Sir Jonathan North College, Leicestershire (WP)	28	1	231	8	6	27
Sandymoor Ormiston Academy, Cheshire (WP/U)	26	1	200	8	2	25
The Emmbrook School, Berkshire	23	1	148	6	18	19
Malton School, North Yorkshire (U)	22	1	299	14	9	19
Middlesbrough College, Middlesbrough (WP/U)	20	1	85	4	45	13
Tupton Hall School, Derbyshire (WP/U)	13	1	112	9	0	12
Litcham School, Norfolk (U)	11	1	213	19	1	11
Derby College, Derbyshire (WP)	8	1	58	7	1	8
St Dominic's School, Surrey (WP)	7	1	110	16	13	3
Gillotts School, Oxfordshire	6	1	90	15	0	4
Guildford High School, Surrey	4	1	29	7	0	4
Oasis Academy Sholing, Southampton (WP)	4	0	0	0	5	1
Seymour Road Academy, Manchester (WP)	1	1	6	6	0	0

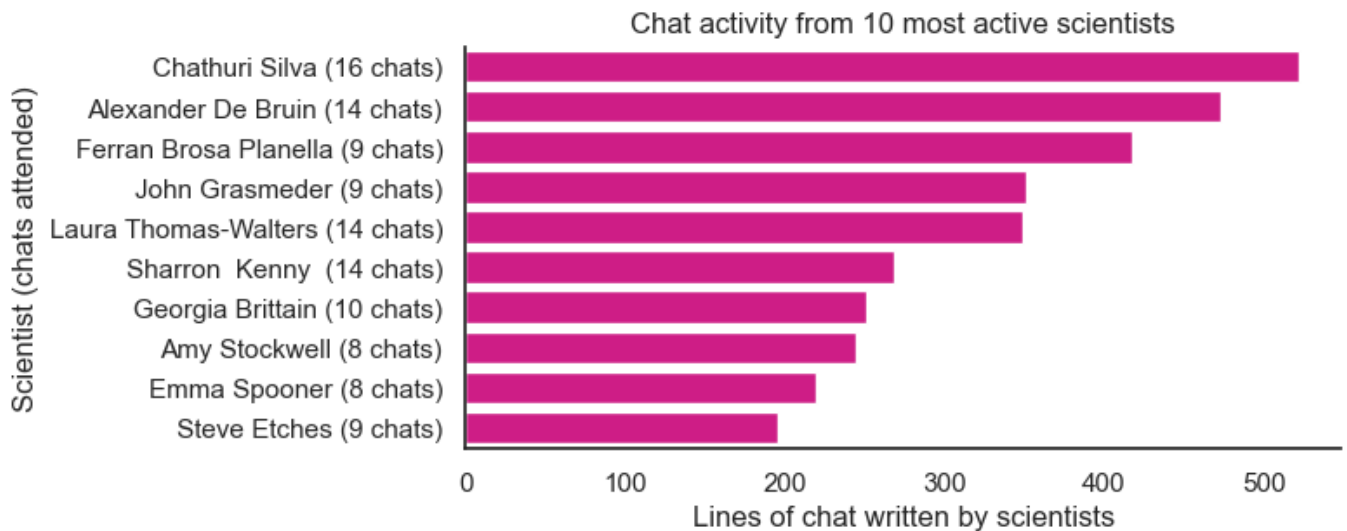
School	Active users	Chats attended	Chat lines (total)	Chat lines (per user)	Follow up questions approved	Votes
Potters Bar Clinic School, Hertfordshire	0	1	25	25	0	0
Chewton Mendip Primary School, Somerset	0	1	22	22	0	0
South Wilts Grammar School for Girls, Wiltshire (U)	0	1	16	16	0	0
St Chad's C.E. Primary School, Staffordshire	0	1	12	12	0	0

** In these chats teachers typed questions on behalf of their students, with the chat displayed on a screen.*

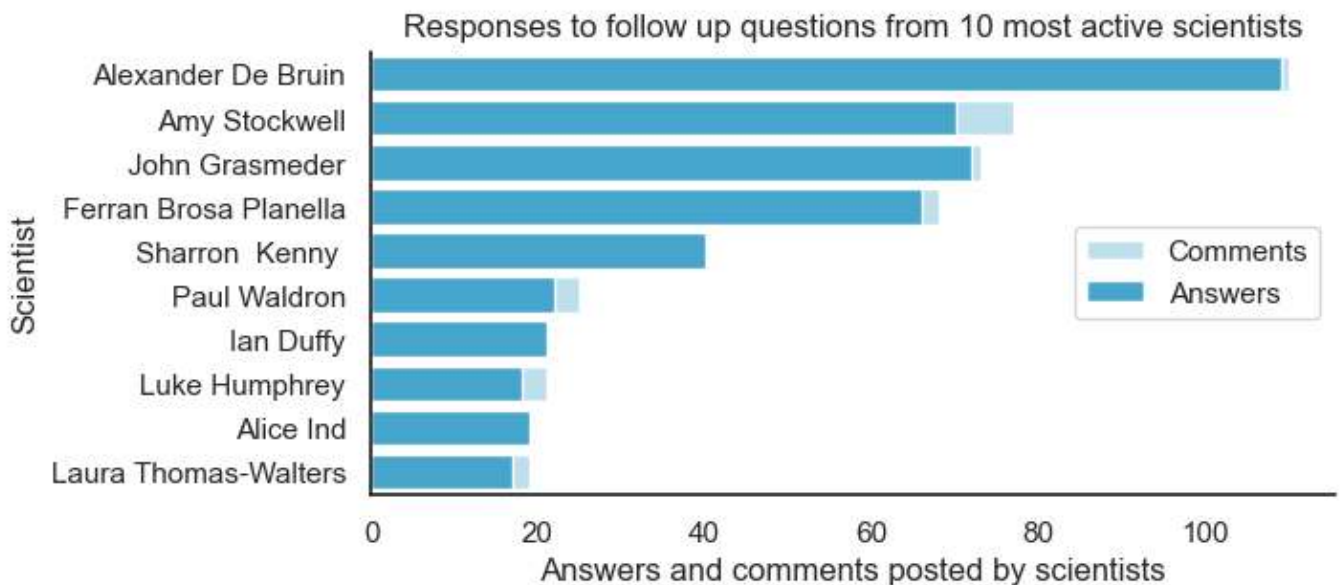
We want to increase the participation of under-represented groups. Find out what we mean by under-served (U) and widening participation (WP) schools, and how you can support us in working with more of these: about.imascientist.org.uk/under-served-and-wp

Scientist activity

During the Zone the scientists interacted with students by writing 4,941 lines of Chat, and providing 618 answers to 208 follow up questions. On average, 5 scientists took part in each Chat.



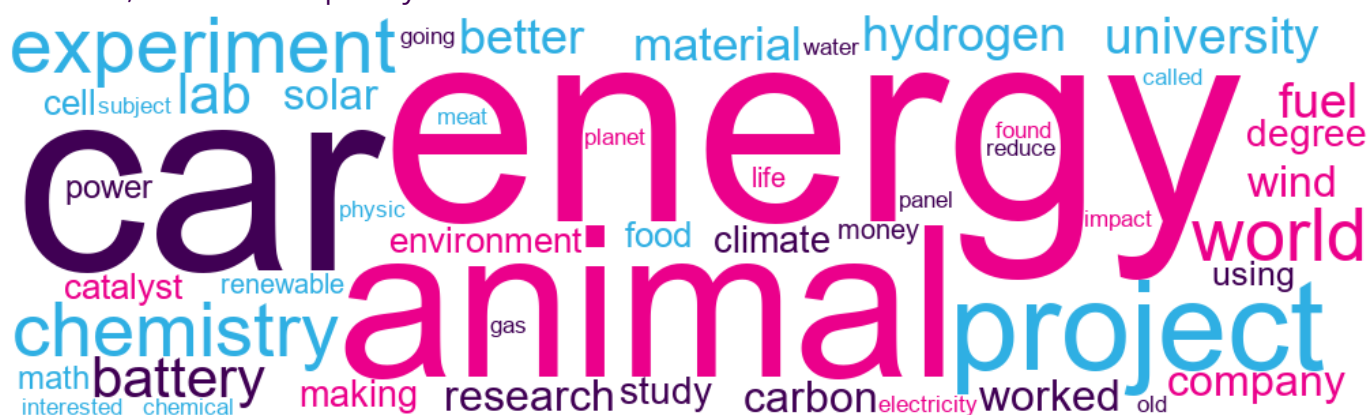
The scientists shown wrote 68% of the lines of chat in the zone. The average scientist attended 5 chats, and wrote 130 lines.



The scientists shown posted 73% of the answers, and 79% of the comments in the zone. The average scientist posted 17 answers, and 1 comments.

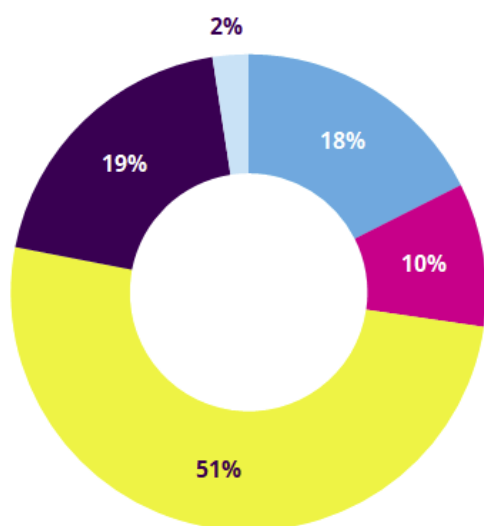
Chats

The word cloud below demonstrates what students and scientists talked about in Chats. The bigger the word, the more frequently it was used.



Follow up questions

The chart below shows an analysis of questions students sent to the scientists. Questions are coded into overarching categories. The examples are coloured by category.



- STEM topics
- Working scientifically
- Careers and education
- Personal
- Event/Other

In your opinion, what is the best way to improve our environment and when do you think the UK could achieve it?

How many years till we use up all of are natural resources?

What is the most memorable project you've worked on?

Do you attend any science conferences?

Do you have specific hours to work or does it depend on the day?

Do you see any new careers coming up in your fields?

Do you knit or crochet your socks? Also are they science-themed?

What countries have you been to?

Examples of good engagement

Overcoming fear can be a big part of any career. Francesca provides some thoughts on what she would define as the scariest project she has been involved with and then asks a question of her own about favourite subjects!

Student 1: What was the scariest science project you have done?

Francesca (scientist): That's a very good question! We work with quite large bottles of chemicals which when mixed together can set on fire, so most days I can be nervous doing my experiments

Student 1: wow, that's so interesting i hope none of them go wrong for u ur my fav

Francesca (scientist): Ah thank you! What are your favourite subjects at school?

Student 1: pe im very sporty if i do say so myself

Francesca (scientist): That's great, I play hockey every week and I love it. I would never stop playing sports

It is good to hear from scientists that they don't always know what they are doing. Imposter syndrome can affect even those at the highest pinnacle of their career... don't let anyone tell you otherwise!

Student 2: Do you ever feel like you have no clue what you are doing?

Mickella (scientist): Definitely! Whenever I want to start a new study in a new area

Lizzie (scientist): Absolutely! Haha imposter syndrome is a tricky thing to deal with. I've got a PhD in Chemistry and still have these days haha

Sharron (scientist): quite a lot. science is all about learning new things and the learning never stops

Sam (scientist): Yes, sometimes! You can never know everything in science, and there's always people who'll know more and there's more to learn. So it's important to see that as a good thing and keep taking opportunities to find out more!

Alice (scientist): Yes, especially in a new field/job, but it means you've got lots you can learn from this. It takes courage to keep on asking questions or asking for help but you grow from it.

A question that delves deep into a subject that can often support or limit the type and amount of research that can be conducted: funding! Ferran, Georgia, Polly and Ian provide some insight into what funding is available and how the distribution of it in their subject area.

Student 3: Is there sufficient funding to develop these technological advancements required?

Ferran (scientist): It depends on how fast we want to get there. With more funding, you advance faster (as we saw with Covid vaccines)

Georgia (scientist): I think there is a lot of funding in certain areas, but I cannot speak outside of what I work with. As @Ferran said, with more funding, things tend to happen more quickly

Polly (scientist): There is quite a bit of funding from both the UK government & Europe which startup companies in particular can apply for. It'd be great if bigger companies invested more time and money into this sector though.

Student 3: Some of these bigger companies include oil companies. How do you think they can contribute or how can they be encouraged?

Ian (scientist): I've been working for one such company, which is fully committed to this and investing heavily. It's about whether they can see a market that will work, and that's where governments and regulators are important to create that stability.

Polly (scientist): Very good question. Oil companies need to spread their work into making current operations more efficient and less energy intensive, work on renewable sources.

Polly (scientist): As a scientist you can never have too much funding and you're always looking for ways to unlock more for the next advancement in your process. funding tends to be released in stages as progress is made rather than all at once

The use of sustainable fuels is a hot topic in the world right now and as the students have explored low carbon themes, it is naturally one that they have asked the scientists about. Here, Georgia, Polly and Ian contribute some thoughts on the future of hydrogen powered transport systems.

Student 4: What do you think of the development of hydrogen powered cars and transport?

Georgia (scientist): I think it's a very promising technology! With hydrogen fuel, the only real bi-product will be water vapour so should help to reduce a lot of the pollutants given off by petrol and diesel engines. Also, the aim is to hopefully be able to have hydrogen filling stations similar to that of regular petrol stations :)

Student 4: What are the issues which need to be overcome in order to make hydrogen fuel viable?

Polly (scientist): There needs to be a good way in which to transport and store the hydrogen. Hydrogen is known to be highly flammable when mixed with the smallest amount of air. It also has a low volumetric energy density being the lightest of all the elements so it is easily lost into the atmosphere

Ian (scientist): What is needed is a clear signal from government/regulators. That gives companies the confidence to develop and scale business models to finance these things.

Scientists of the week

Students voted each week for their favourite scientist to be named scientist of the week.

The scientists of the week were:



Sharron Kenny, who x-rays materials and discovers what they are made of



Ferran Brosa Planella, who uses the power of maths to make batteries last longer



Enya Gomes Clynych, who works to reduce carbon in eco-friendly energy solutions

Winning scientist

The overall winner, with the most votes at the end of the Zone was **John Grasmeder**, a chemist working on materials used in smartphones, cars, aeroplanes and human bodies!

As Zone winner, they receive £500 to spend on further public engagement projects.



"I was overwhelmed with the number of students and teachers who joined the scientists to chat with us – I really need to learn to type faster! There were loads of interesting questions (and some were quite a challenge to answer!) It was great to interact with such enthusiastic people.

I hope the answers to the questions posted on the website and in our online chats gave you a good idea of what it is like to be a scientist and do scientific research and development as a job and as a career. I'm working with my colleagues on a STEM outreach activity to use the prize money with schools and colleges in the Blackpool area."

You can read their full statement at [here](#)

Feedback

"Thanks so much to the scientists for giving up their time to answer our questions- the students have learned a lot and are now feeling inspired to use their chemistry A Level in their future studies and career 😊 have a lovely rest of your day!"

Teacher

"It's my last chat tomorrow and I've enjoyed it so much. i never imagined to begin with it would be such fun"

Sharron, Scientist

"This has been so fun and I got some questions answered!!"

Student

"Thanks everybody for the amazing answers :D"

Student

"The children at my school have really been enjoying the I'm A Scientist talks"

Teacher

"Thank you for answering our questions. We've really enjoyed speaking to you!"

Teacher

"I've again been impressed with the breadth and quality of questions brought by the students."

Alex de Bruin, Scientist

"I'm a Scientist is a great way to engage with students - it's easy and accessible. Nothing needs to be sourced for the event ahead of time."

Scientist

"Thank you for telling us everything. We can't wait to book another chat when all our friends are here next week!"

Student

"Students were very enthusiastic about talking to 'real' scientists."

Teacher

"I thoroughly enjoyed taking part in the I'm a Scientist sessions and am sad now that they are over! It was fantastic interacting with the students and seeing their curiosity in science and in the work I do!"

Enya Gomes Clynych, Scientist