

March 2023

The Molecule Zone (molecule.23.imascientist.org.uk) ran from 6 to 31 March 2023 and was funded by the Royal Society of Chemistry (RSC), and ScotChem.

Key activity figures

	Molecule Zone	March 2023 Mean
Students logged in	971	815
Students active	96%	90%
Schools	49	33
Scientists allocated	55	42
Scientists active	35 (64%)	28
Chats booked	85	75
Chats took place	59	48
Lines of Chat	13,328	12,417
Average lines per Chat	226	256
Follow up questions asked	222	201
Follow up questions approved	187	151
Answers given to follow up questions	821	451
Scientist comments	61	41
Student comments	5	5
Votes	529	453

Who took part?

The Zone featured scientists working in chemistry; 55 were allocated to the zone, with 41 completing profiles. Of those, 36 were RSC members and 24 ScotChem members. 35 scientists actively engaged in the Zone through Chats and answering follow up questions, 29 were RSC members, and 16 ScotChem members.

They connected with 971 students from 49 schools across the UK, including 276 students from 10 ScotChem targeted schools. 96% of students actively participated by joining Chats, asking follow up questions, commenting, and casting votes.

69% of active students were from priority schools: 31% from underserved schools and 45% from widening participation schools.

A total of 529 votes were cast by students. The winning scientist with the most student votes was **Martin McCoustra**, an astrochemist studying how chemistry controls the evolution of the Modern universe.

Activity

85 Chats were booked. 59 took place.

Out of the remaining 26 Chats booked, 21 were cancelled and in 5 cases, the school did not attend and did not give notice. All schools were chased and invited to rebook.

There were 12 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.

School activity

Students from 49 schools across the UK actively participated in the Zone.

School	Students logged in	Active users	Chats attended	Chat lines (total)	Chat lines (per user)	Follow up questions approved	Votes
The Kingsbrook School, Bucks	127	124	5	1,348	11	29	74
Sir Herbert Leon Academy, Buckinghamshire (WP)	76	71	4	857	12	3	12
Biggar High School, South Lanarkshire (U)	50	49	3	303	6	5	46
Furness Academy, Cumbria (WP/U)	60	47	5	504	11	5	21
Hillhead High School, Glasgow City (WP)	54	43	3	292	7	9	27
Ravensthorpe CE Junior School, West Yorkshire (WP)	43	42	2	341	8	6	17
Clevedon School, Somerset	30	30	1	413	14	2	30
St George's Primary School, Dorset (WP)	29	29	2	442	15	1	25
Darrick Wood School, Kent (U)	33	29	1	399	14	7	28
Litcham School, Norfolk (U)	27	27	1	337	12	0	26
Kirkcudbright Academy, Dumfries & Galloway (U)	28	27	2	325	12	7	26
The Priory School, Shropshire (U)	29	26	2	196	8	0	11
Whitehall Junior Community School, Middlesex (WP)	26	26	1	24	1	3	1
Trinity primary academy, London (WP)	25	23	2	168	7	5	0
The West Bridgford School, Nottinghamshire	22	22	1	93	4	2	19
The Rawlett School, Staffordshire	22	20	1	148	7	0	20
James Gillespie's High School, Edinburgh City	20	19	1	69	4	2	19
St Joseph's College, Dumfries & Galloway (U)	23	18	1	130	7	16	16
Shimna Integrated College, Down (WP)	18	17	1	254	15	10	16
The City of Leicester College, Leicestershire (WP)	17	16	1	185	12	1	2

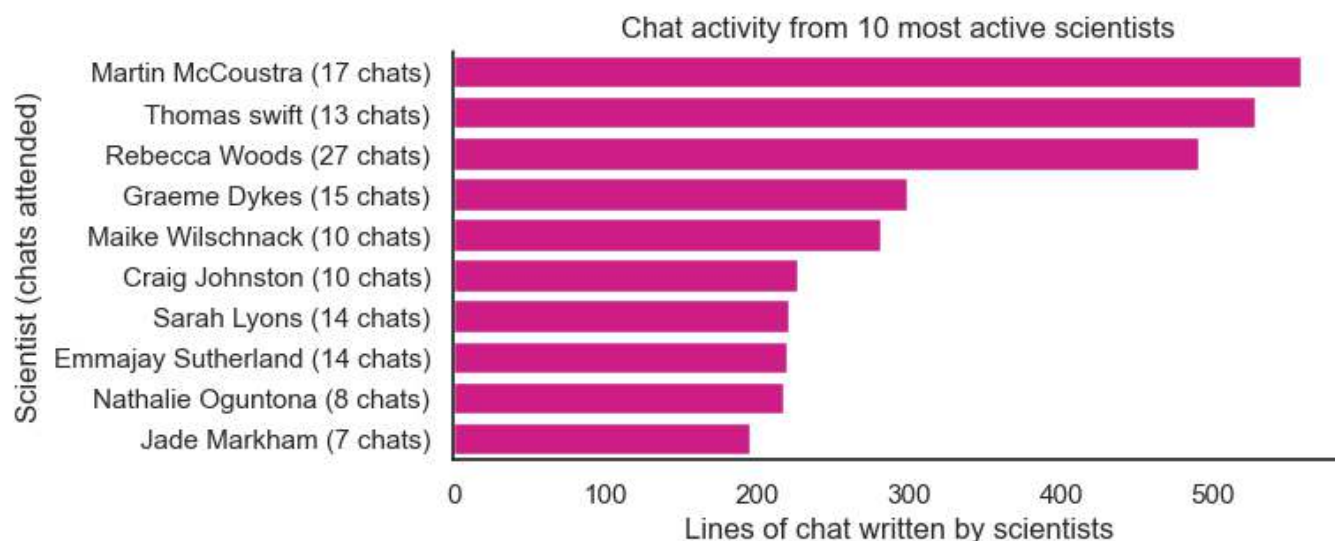
School	Students logged in	Active users	Chats attended	Chat lines (total)	Chat lines (per user)	Follow up questions approved	Votes
Fraserburgh Academy, Aberdeenshire (U)	17	15	1	102	7	9	11
Cambridge Regional College, Cambridgeshire (WP)	17	13	1	28	2	2	10
Bexhill College, East Sussex (WP)	13	12	1	67	6	3	11
Exeter College, Devon	13	12	1	43	4	0	8
Billinghay CE Primary School, Lincolnshire (WP/U)	12	12	0	0	0	6	1
Gillotts School, Oxfordshire	9	9	1	77	9	0	0
Richard Taunton Sixth Form College, Hampshire (WP)	12	9	2	29	3	6	7
Mulberry School for Girls, London (WP)	8	8	1	97	12	5	7
New College Swindon, Wiltshire (U)	10	8	1	49	6	1	8
Cox Green School, Berkshire	7	7	1	52	7	0	0
Newbattle High School, Midlothian (WP)	6	6	1	80	13	0	6
Manor Drive Secondary Academy, Cambridgeshire (U)	9	6	1	77	13	0	2
The Becket School, Nottinghamshire	7	6	1	47	8	0	4
City of London Academy Highbury Grove, London (WP)	8	6	0	0	0	7	6
Furness Primary School, London	5	5	2	36	7	18	0
Acorn Park School, Norfolk (WP)	4	4	1	54	14	0	4
Dartford Science & Technology College, Kent	4	4	0	0	0	4	0
Europa School UK, Oxfordshire	3	3	1	101	34	7	3
Shirenewton Junior & Infant School, Monmouthshire	3	3	0	0	0	0	3
Peterhouse School, Merseyside (WP)	3	2	3	61	31	3	0
Woodhouse Academy, Staffordshire (U)	2	2	1	34	17	0	0
South and City College Birmingham, West Midlands	3	2	1	24	12	0	0
St Benedict's Catholic College, Essex	2	2	0	0	0	3	1

School	Students logged in	Active users	Chats attended	Chat lines (total)	Chat lines (per user)	Follow up questions approved	Votes
Roundwood Primary, Bucks (WP)	1	1	1	17	17	0	0
The Thomas Adams School, Shropshire (U)	5	1	0	0	0	0	1
Embleton Vincent Edwards Church of England Primary School, Northumberland (U)*	0	0	1	28	28	0	0
Woodland Middle School Academy, Bedfordshire*	0	0	1	17	17	0	0
Southfields Primary School, Cambridgeshire (WP)*	0	0	1	7	7	0	0
Yavneh College, Hertfordshire	12	0	0	0	0	0	0

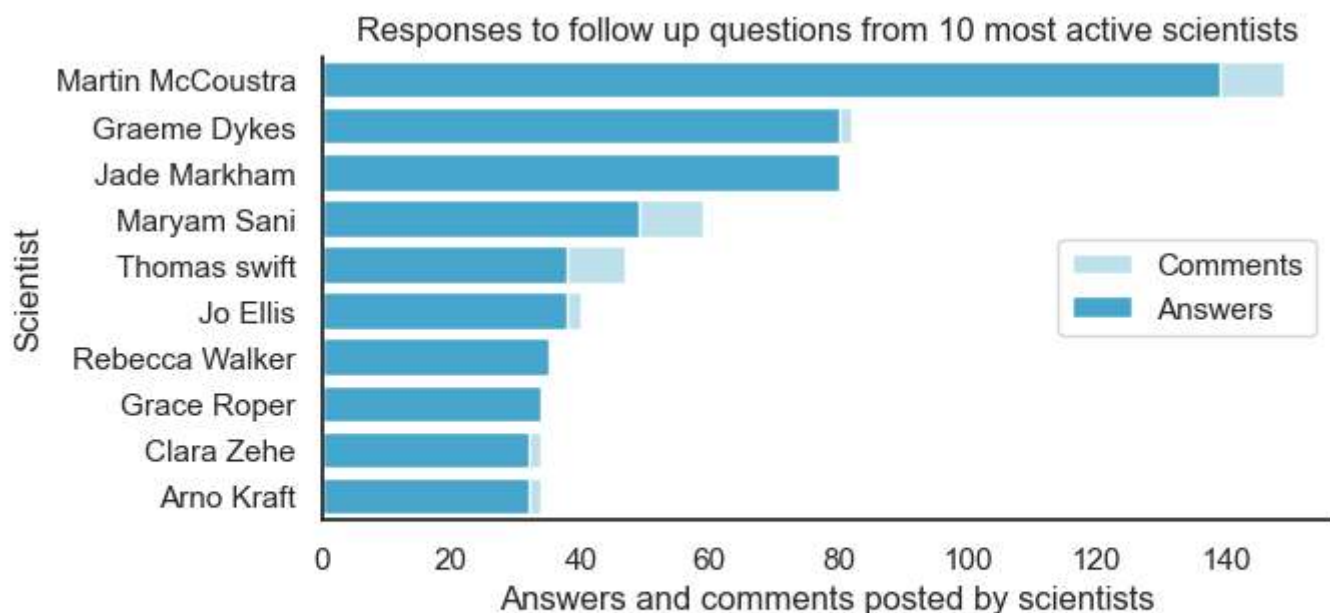
** In these chats teachers typed questions on behalf of their students, with the chat displayed on a screen.*

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



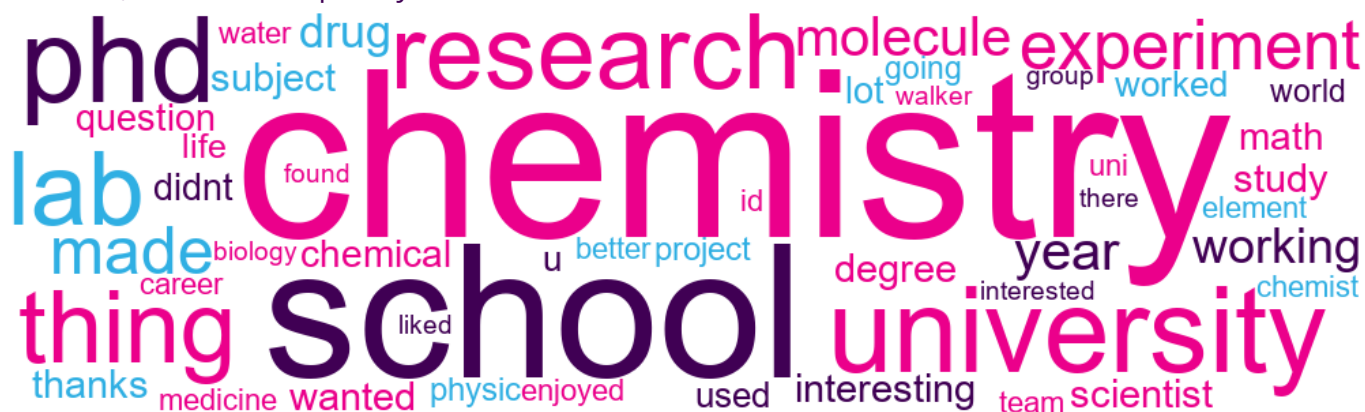
The scientists shown wrote 61% of the lines of chat in the zone.
The average scientist attended 7 chats, and wrote 152 lines.



The scientists shown posted 68% of the answers, and 61% of the comments in the zone.
The average scientist posted 23 answers, and 2 comments.

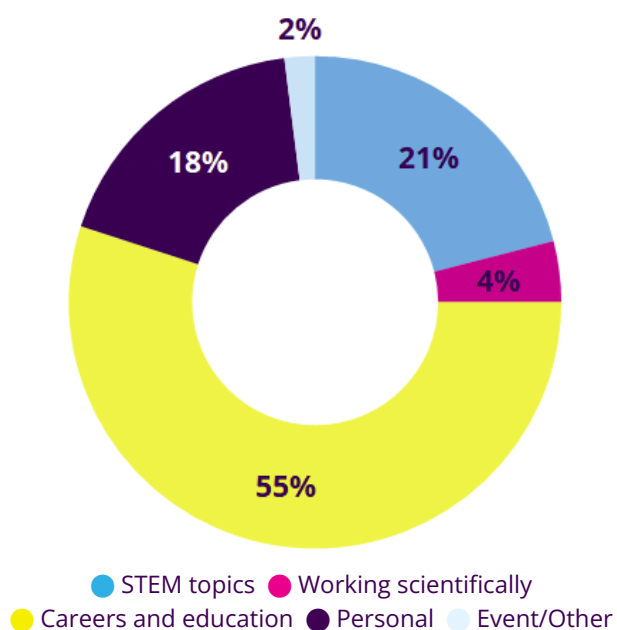
Chats

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.



what would aliens see if they looked at our world

What is the difference between organic chemistry and chemistry?

Do u do animal testing? and if so why ?

how long does it take to make the drug that could cure cancer and how many different ones do you have to make if there is many different cancers?

Do you think its worth pursuing a career in sciences if your not necessarily the best at it, even if you enjoy it ?

I was wondering whether your workplace offers any work placements during this summer.

What is the most interesting thing that happened to you in your career (not including payrise, promotions or lottery winnings).

how do you feel about Joe Biden approving of the willow project in alaska

Examples of good engagement

Students enjoy asking scientists about why they study particular subjects... and importantly, whether they actually enjoyed the subject they built a career around. Thomas provides some useful insights for this student.

Student 1: Did you always enjoy studying Chemistry?

Thomas (scientist): Yes, apart from first year college. I struggled there and nearly dropped it

Student 1: Are you happy you didn't?

Thomas (scientist): Definitely. I dropped history - which I loved to study - but I couldn't study something and then sit an exam and not know how i'd done. As hard as science and maths exams are... you have a good idea when you walk out if you knew the answer or not

Student 1: Thanks, I am excited to continue in science

And what about those topics that can be overlooked? Rebecca helps to dispel the myths surrounding underfunded topics in disease research.

Student 2: Your job is interesting. Do neglected diseases gain more attention than other diseases or are they sort of un - noticed?

Rebecca (scientist): In the past these diseases have been neglected, things like malaria/TB/HIV got the funding/notice, but there is more work nowadays i'd say, especially from groups like the Gates foundation and WHO. There's also deals from pharma companies to supply the drugs at cost to the WHO.

A subject specific question asked of Rebecca! This scientist was able to offer some information for this student which helps to make complex topics simpler.

Student 3: What are multifunctional probes and what do they do?

Rebecca (scientist): Multifunctional probes bind a target protein, as well as doing something else (to make it multifunctional). A lot of my probes have an 'affinity handle' which allows me to extract the probe-protein complex from cells.

A question that students often ask covers how candidates connect with science. Ilija provides some insight regarding his reasons for engaging with science topics.

Student 4: What made you get into science?

Ilija (scientist): Curiosity. I want to know how things work. And the excitement of figuring these things out is addictive.

Student 4: Were you always into science?

Ilija (scientist): Eh in a way. I always enjoyed studying it at school (I like the logical approach to problem-solving) but doing scientific research is a far messier, more creative process. Getting involved in scientific research really proved to me how enjoyable it can be.

Thomas and Sophie provide some clarity to this question that aims to understand the benefits of science.

Student 5: Why is science important?

Thomas (scientist): Because its how we are going to solve the worlds problems. Clean energy, stop plastic pollution, make more stuff from things that aren't oil, cure diseases. There are loads of problems and people doing science are the ones testing what is and what isn't feasible as a solution

Sophie (scientist): It can help understand the world around us and solve problems, cure diseases, improve manufacturing so it doesn't pollute as much.

Career oriented questions can be helpful in guiding students' perceptions of what is required to reach a similar stage. Graeme, Sophie and Ilija provide some helpful insights in their answers.

Student 6: What would you advise if we wanted to do your job?

Graeme (scientist): Master the basic knowledge. You learn a lot on the job but you need to be able to speak the language with other scientists. You need to be able to make the right calculations. you need to be able to share your results in a clear way

Sophie (scientist): Try and get some work experience so you can understand what it is like doing the work, and what skills you will need

Student 6: Thank you

Jo (scientist): There are apprenticeship routes in for statistical roles, but for my role we have a few student placements for people spending a year out of their degree in industry

This student has asked a scientist about the specifics of their work and followed with more focused questions as the scientist gives more information. It is always interesting to see this sort of engagement between students and candidates!

Student 7: What pharmaceuticals or cosmetics do you work on?

Joshua (scientist): I actually work on the same site as Sarah! The cosmetics we make end up in face creams and hair products to replenish the natural oils in your skin and the pharmaceuticals are very varied. They can be intermediates used to make antibiotics, cancer treatments, all sorts! I also made lots of a fuel additive for a formula 1 team recently.

Student 7: What team did u work with?

Joshua (scientist): Renault. I used to have regular chats with one of the pitside engineers. He would take his calls from me with the sound of the track going in the background. Very exciting!

Student 7: Very interesting! What did u do with the fuel additive and what processes did you use?

Joshua (scientist): We originally developed a multistage synthesis for this additive around 5 years ago. We then shared that information with another of our production facilities in Shanghai. Shanghai then make this material "crude" for us in large quantities (300+ kilos). Shanghai then ship it to us, and we purify it by distillation, and end up with about 180 kg of super pure additive, which we shipped to Renault in Essex.

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:



Arno Kraft, a lecturer of Chemistry at Heriot-Watt in Edinburgh



Martin McCoustra, an astrochemist studying how chemistry controls the evolution of the Modern universe



Fabio Nudelman, studies how animals make hard materials like bone, teeth, sea shells, pearls and sea urchin spines

Winning scientist

The overall winner, with the most votes at the end of the Zone was **Martin McCoustra**, an astrochemist studying how chemistry controls the evolution of the Modern universe

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



"Engaging with the students during "I'm a Scientist..." can be very intense but it is immense fun. It is the students, with their immense curiosity to ask a wide range of questions, that makes it fun.

I should add, that as promised, I will be donating the prize money to the Student Chemical Society at Heriot-Watt University to encourage them in their outreach activities in what is the 50th Anniversary of HWU Chemistry Department taking students in undergraduate programmes on our Riccarton Campus"

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

Feedback

"Thank you so much for engaging with us today it is really appreciated thank you"

Teacher

"Thank you for answering our questions! It was very interesting!"

Student

"We have enjoyed this so much thankyou"

Student

"Thanks to all of you for the great questions!"

Ilija (scientist)

"My students are really engaged and we will arrange another session. Thank you so much"

Teacher

"Thank you all so much for your time this morning. I'm sure we've all learned a lot, getting to know about your different experiences. Hope you all have a lovely day!"

Teacher

"Thank you scientists that was very interesting"

Student

Funding partners

The Zone was funded by:

