March 2023

The Plant Zone (plant23.imascientist.org.uk/) ran from 6 to 31 March 2023 and was funded by UK Research and Innovation, the John Innes Centre and the STEM Ambassador Scheme.

Key activity figures

	Plant Zone	March 2023 Mean
Students logged in	733	815
Students active	91%	90%
Schools	28	33
Scientists allocated	37	42
Scientists active	22 (59%)	28
Chats booked	65	75
Chats took place	41	48
Lines of Chat	10,212	12,417
Average lines per Chat	249	256
Follow up questions asked	200	201
Follow up questions approved	154	151
Answers given to follow up questions	332	451
Scientist comments	59	41
Student comments	5	5
Votes	388	453

Who took part?

37 scientists working in academia and industry were allocated and given access to the zone; 22 were active in Chats and answering follow up questions. The zone included PhD researchers looking at the effect of aphids on plant crops and how the Venus flytrap recognises insects alongside senior lecturers and plant pathologists working on protecting UK plants from diseases. Participants (students and scientists) wrote 10,212 Chat lines and asked 154 follow up questions.

733 students from 28 schools across the UK logged into the Zone and connected with 23 scientists.

85% of active students were from priority schools: 44% from underserved schools and 72% from widening participation schools.

A total of 388 votes were cast by students. The winning scientist with the most student votes was **Ilma Qonaah**, who researches natural ways to protect wheat crops from aphids.

Activity

41 Chats took place.

There were 7 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 200 follow up questions of which 154 were approved and sent to scientists.

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School activity

Students from 28 schools across the UK actively participated in the Zone.

School	Active users	Chats attended	Chat lines (total)	Chat lines (per user)	Follow up questions approved	Votes
Coombe Wood School, London (WP/U)	101	2	500	5	11	55
Sir Herbert Leon Academy, Buckinghamshire (WP)	72	4	646	9	3	28
Southfields Primary School, Cambridgeshire (WP)	53	3	217	4	19	13
Trinity Primary School, London (WP)	51	2	359	7	25	23
Furness Academy, Cumbria (WP/U)	41	3	292	7	5	12
*Victoria Primary School, Edinburgh City (WP)	38	2	791	21	11	32
Churchwood Primary Academy, East Sussex (WP/U)	28	1	373	13	9	21
Clevedon School, Somerset	27	1	567	21	0	27
Darrick Wood School, Kent (U)	26	1	169	7	7	23
Parmiter's School, Hertfordshire	26	1	294	11	14	5
Sir Harry Smith Community College, Cambridgeshire (U)	22	1	172	8	1	21
The Highfield School, Hertfordshire (WP/U)	22	1	406	18	0	20
Mulberry School for Girls, London (WP)	20	1	221	11	4	17
Jarvis Brook School, East Sussex (WP/U)	19	1	263	14	2	18
Exeter College, Devon	17	1	56	3	0	17
*Sir William Romney's School, Gloucestershire (U)	17	1	35	2	24	3
Fulwood Academy, Lancashire (WP)	16	1	113	7	4	9
Pinner High School, Middlesex	13	1	48	4	3	10
Acorn Park School, Norfolk (WP)	11	3	159	14	0	11
Wigan and Leigh College, Lancashire	10	2	80	8	5	4

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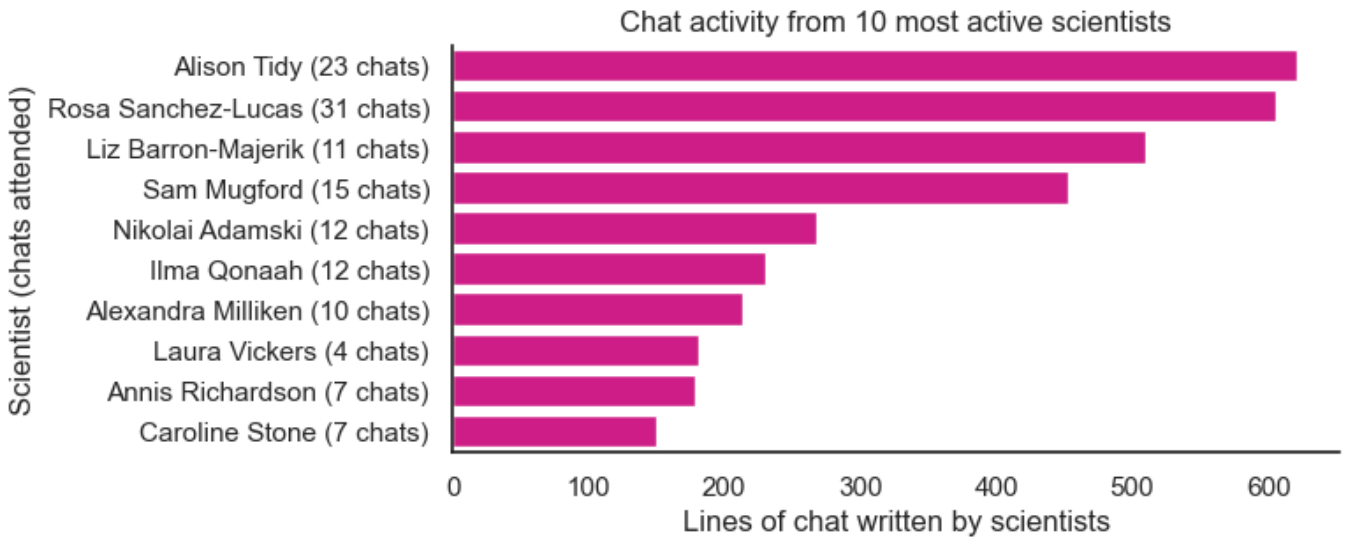
School	Active users	Chats attended	Chat lines (total)	Chat lines (per user)	Follow up questions approved	Votes
John F Kennedy Catholic School, Hertfordshire (U)	9	1	72	8	0	8
Peterhouse School, Merseyside (WP)	8	3	104	13	0	4
The Island Free School, Hampshire (U)	7	1	49	7	0	2
Europa School UK, Oxfordshire	5	1	54	11	5	5
*Furness Primary School, London	4	2	41	10	2	0
*Roundwood Primary, Bucks (WP)	2	2	51	26	0	0
*Beaulieu Convent School, Jersey (U)	0	1	12	0	0	0
*Wymondham High Academy, Norfolk	0	1	5	0	0	0

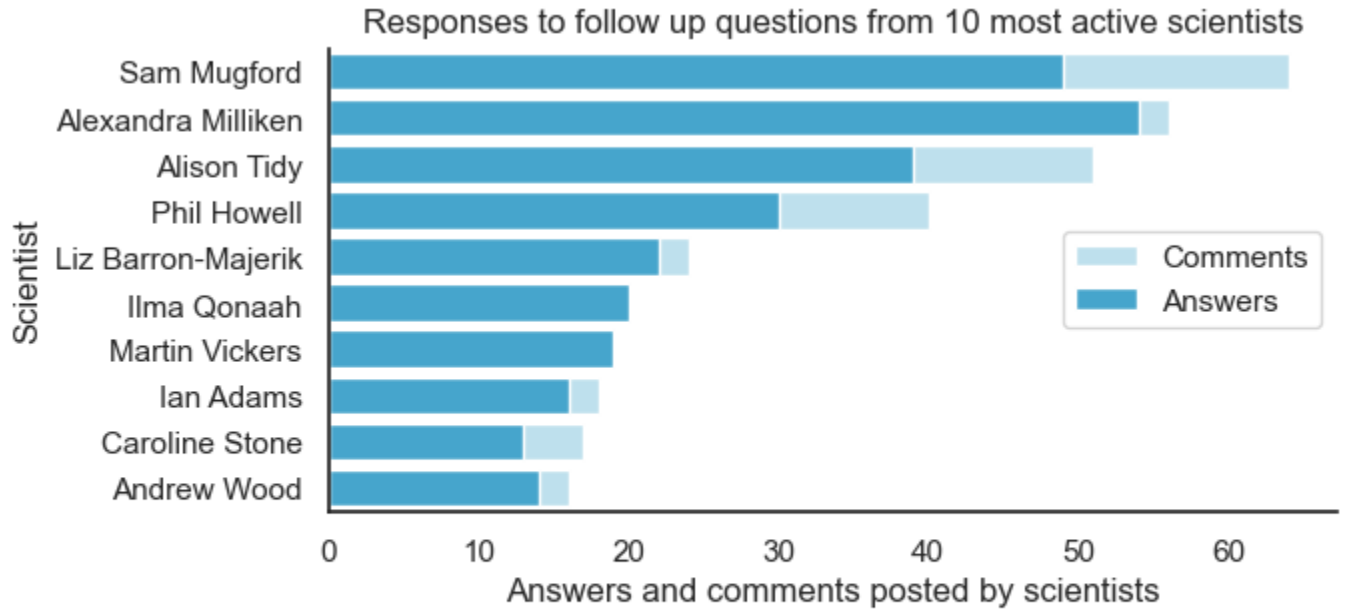
** In these chats teachers typed questions on behalf of their students, with the chat displayed on a screen.*

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 89% of the lines of chat in the zone.
The average scientist attended 7 chats, and wrote 174 lines.



The scientists shown posted 83% of the answers, and 83% of the comments in the zone.
The average scientist posted 15 answers, and 3 comments.

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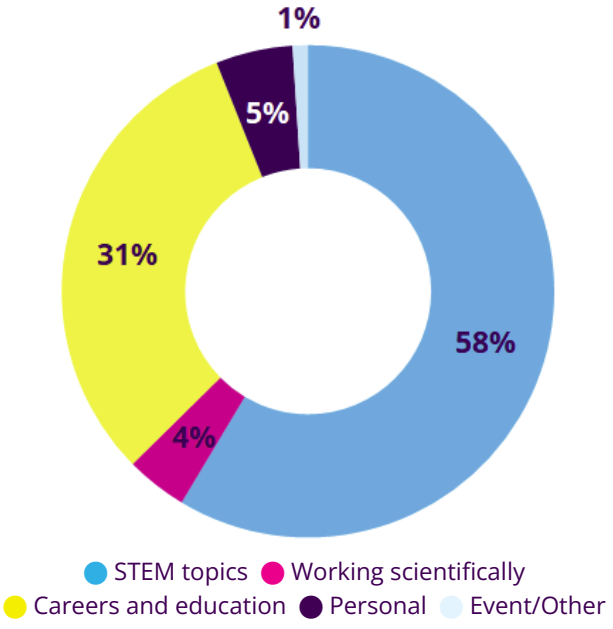
Chats

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.



Can we make a vegan alternative to every food (in the future)?
Is a Venus fly trap alive and conscious of what its doing?
How does your research contribute to decreasing climate change and can you use your knowledge to improve ways for plants to increase oxygen output?
How can understanding plants help us make medicine?
Do you ever regret getting the job you have??
What is the craziest project you have done?
What makes you good at your job specifically, and what qualities do u require?
Why do you think you should win the money?

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Examples of good engagement

Students enjoyed the opportunity to ask the scientists about the intricacies of their work. Here, one of the students asks Sam about why plants are important and Sam explains!

Student 1: Why do we need plants?

Sam (scientist): All of the food we eat comes from plants. If not directly, all the meat people eat comes from animals that eat plants. without plants there would be no food. Also there would be no oxygen in the air. and because most of the rain in the worked comes from water transpired from plants, we would probably also have no fresh water

Students enjoyed asking the scientists quick-fire questions about what got them interested in their job. Liz enjoys explaining how her early life influenced her career choice.

Student 2: Why did you choose to work with plants?

Liz (scientist): My mum was a flower arranger (for weddings) so we were always surrounded by beautiful flowers. I wanted to know their names and why they were all so different - its mostly about how they get pollinated

A fundamental question! Sam, Phil and Andrew provide some interesting answers to help this student understand why plants are important.

Student 3: Why do plants exist?

Sam (scientist): This is a very deep question. they exist because evolution has shaped them over billions of years

Phil (scientist): Tough question. We think they evolved from bacteria billions of years ago. What's sure is that without plants, we wouldn't be here, because they produce all the oxygen we need to breathe

Andrew (scientist): Great question! Very philosophical! Plants exist because they do! They evolved a long time ago as a new way to capture light and turn it into energy

A question that shows personalisation by the student! This type of question offers the scientists the opportunity to explore how science has influenced their lives - personal and work related.

Student 4: Has science helped improve your life?

Liz (scientist): Absolutely - it helps me to think more about what I do and why, and what the consequences are of what I do for the environment

Student 4: It's amazing how science can free your mind

Liz (scientist): Absolutely - its a whole way of thinking

A more specifically oriented question seeking to understand the significance of plants in providing medicinal uses to humans. Alison, Liz and Nikolai provide their insights.

Student 5: How can understanding plants help us make medicine?

Alison (scientist): Plants have been used in medicine for a very long time, there are known to reduce fever, reduce blood pressure and relieve pain. These are known from information handed down by generations. Understanding how these plant compounds works allows us to work out other plant compounds that have similar properties that we can use. A good example of this is aspirin from willow bark

Liz (scientist): Closely related plants often produce similar but slightly different chemicals that could be even better at treating a particular ailment - so also good to know how plant families work!

Nikolai (scientist): Plants have been used for medicinal purposes for thousands of years. Using scientific methods can help us better understand what exactly is causing these health benefits and thus hopefully improve their effects or reduce costs for manufacturing

A subject specific question looking into the ways in which plants use their leaves to function... and the differences between them. Alexandra and Ilma both provide some interesting answers to an equally interesting question!

Student 6: How and why does photosynthesis differ in different plants?

Alexandra (scientist): Different plants have different Co2 concentrating mechanisms. CAM plants (such as succulents/cacti) uptake their CO2 at night when it's cooler (so they lose less

water from their stomata) and carry out the enzymatic photosynthetic reactions in the day. Others like C4 plants (Maize) separate photosynthesis through different cell types.

Student 6: So if a winter plant was grown in a hot climate, would the rate of photosynthesis be lower because it is in the wrong environment?

Ilma (scientist): Pretty much. Stomata opening and closing would cause too much water to be lost from the plant and it would struggle to survive. Plus some plants have enzymes that work at optimum temperatures, if it gets too hot, the enzymes won't function as efficiently.

Student 6: Thank you - that's very clear

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:

Ilma Qonaah, researches plants (specifically wheat) and insects (specifically aphids)

Sam Mugford, researches aphids and their effect on farmers and gardeners

Alison Tidy, studies flower and pollen development, focusing on the effect of heat stress

Winning scientist

The overall winner, with the most votes at the end of the Zone was Ilma Qonaah, researches plants (specifically wheat) and insects (specifically aphids)

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

"This event was a great opportunity for me to communicate with students and teachers at various education level. It was amazing to see everybody's enthusiasm and curiosity. I received a lot of interesting questions that I would not have thought of. Sometimes, I had to dig up old knowledge outside of my field of research to answer them and I believe this will push me to be a better scientist.

Thank you to everybody who has joined me for the past month, the students and their ingenious questions, the teachers and their patience, and of course, I'm a Scientist, Get me out of here! team."

You can read their full statement here

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Feedback

"Thank you for answering the questions from our students at Sir Harry :)"

Teacher

"Thank all of you, this was a great experience!"

Student

"Thank you all very much for answering our questions and taking the time out of your day to talk to us :)"

Student

"The questions are amazing! They really make me think outside the box :)"

Alexandra (scientist)

"This has been a fantastic chat to watch as the teacher - I've hardly had to say anything to keep it going! Thank you scientists for dealing so well with our quick-fire questions!"

Teacher

"Well done all the Scientists, you are amazing! Thank you for taking the time out of your busy schedules!"

Teacher

"I love all the different questions, and also love the interest and enthusiasm for science, if I can help strengthen that then I would be very happy"

Alison (scientist)

Funding partners

The Zone was funded by:

UK Research and Innovation

John Innes Centre
Unlocking Nature's Diversity

STEM 20 YEARS AMBASSADORS

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