November to December 2022

The Energy Zone (energy22.imanengineer.org.uk) ran from 7 November to 16 December 2022 and was funded by UKRI, Cavendish Nuclear and bp.

The Zone featured **20 engineers** working across a variety of fields. They connected with **336 students** from across the UK. **315 students (94%) actively participated** by writing Chat lines and asking follow-up questions.

Key activity figures

	Zone
Schools	11
Students logged in	336
Students active	94%
Engineers	20
Live Chats booked	21
Live Chats occurred	16
Average lines per live Chat	483
Questions asked	96
Questions approved	58
Answers given	144
Engineer comments	15
Votes	131

Who took part?

Students from 11 schools across the UK logged into the Zone.

Impressively, 87% of active students were from priority schools: 40% from underserved schools and 47% from widening participation schools.

A total of 131 votes were cast by students. The winning engineer with the most student votes was **Paul James**, Mechanical Integrity Engineer at BP Sunbury.

Activity

21 live Chats were booked. 16 took place.

Out of the remaining 5 Chats booked, 4 were cancelled and in one the school did not attend and did not give notice. All schools were chased and invited to rebook.

It is common for students to share login details or computers during live chats. Therefore, the number of students engaged will be higher.

Students asked 96 follow-up questions of which 58 were approved and 28 were duplicates.

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School activity

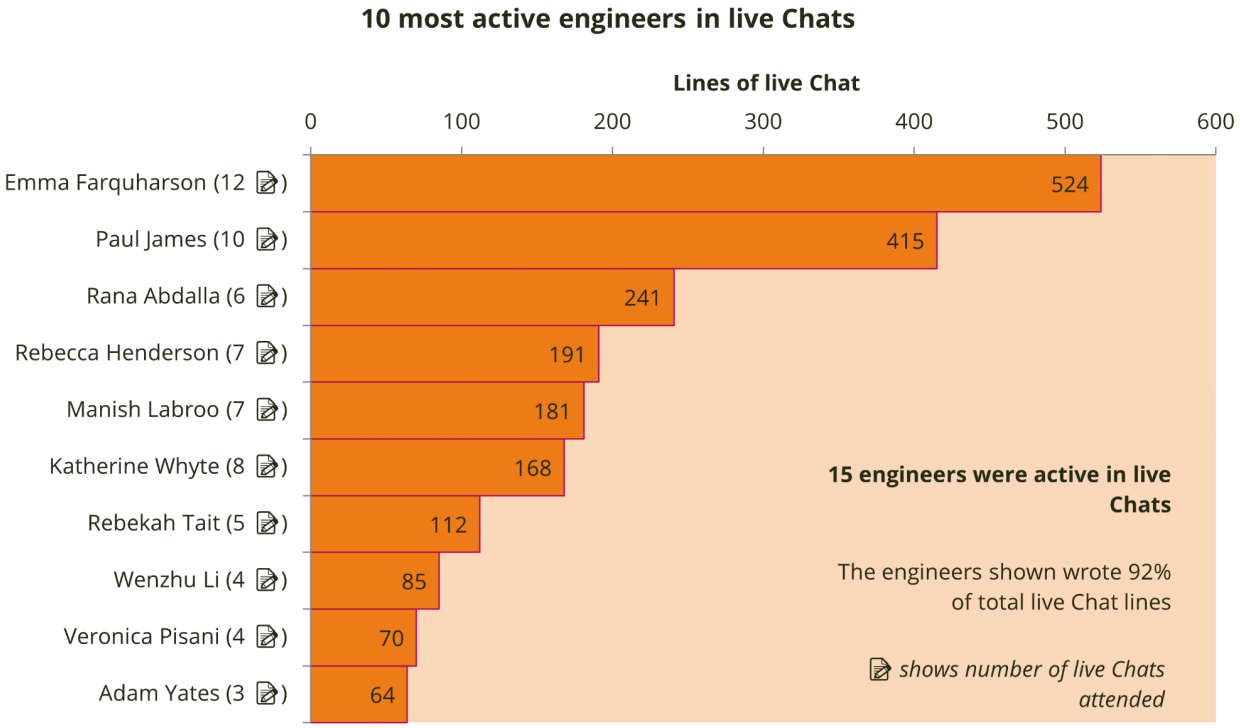
Students from 12 schools across the UK participated in the Zone.

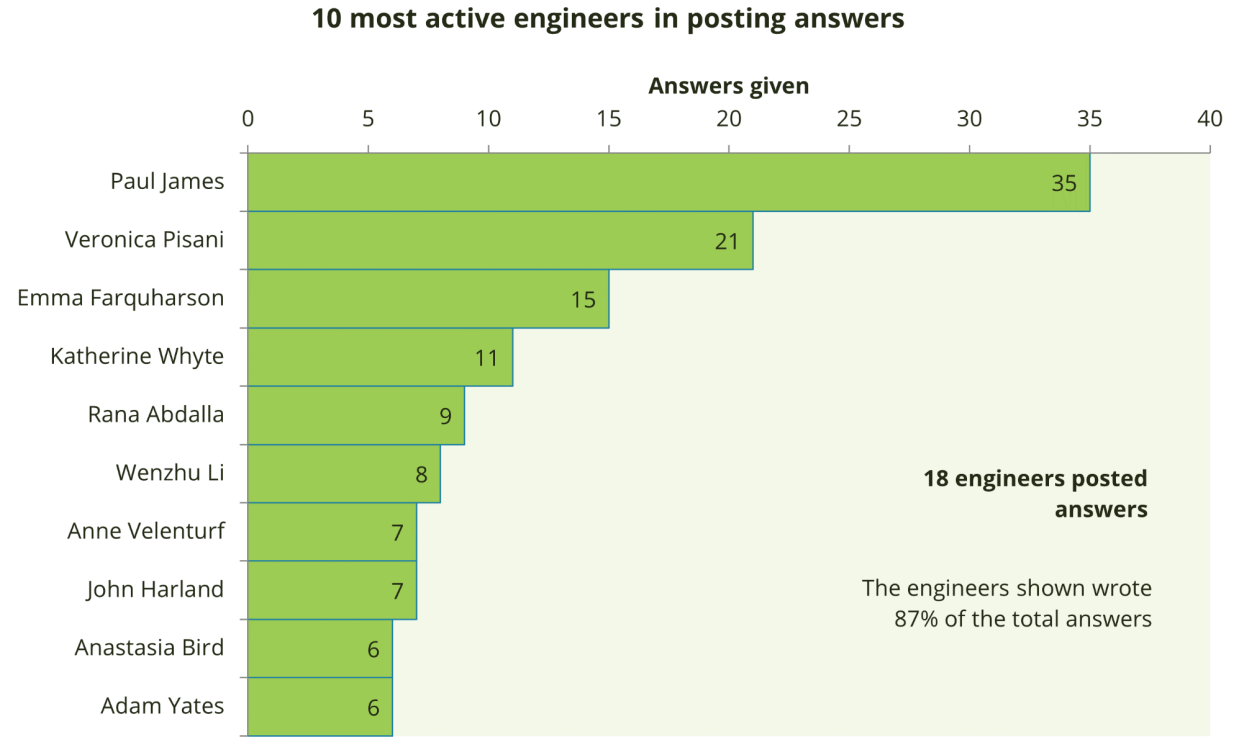
School	Students logged in	Active users	Chats attended	Chat lines (total)	Chat lines (per user)	Questions approved	Votes
Harris Girls' Academy East Dulwich, London (WP)	80	75	3	1,575	21	8	37
St Bridget's Primary School & Nursery Class, Glasgow City (WP)	53	53	2	975	18	0	28
Twynham School, Christchurch (U)	55	49	2	848	17	37	0
Lanark Grammar School, South Lanarkshire (U)	36	35	2	366	11	1	17
Darrick Wood School, Orpington (U)	26	25	1	403	16	2	17
Caroline Chisholm School, Northampton	22	23	1	461	20	0	0
The University of Birmingham School, Birmingham (WP)	21	21	1	64	3	2	16
Southwark College, London	15	13	1	99	8	0	0
Mid Yell Junior High School, Shetland Islands (U)	9	10	1	93	9	4	10
The Priory School, Shrewsbury U)	11	10	1	173	17	1	2
Newcastle and Stafford Colleges Group, Newcastle-under-Lyme	8	9	1	54	6	2	4

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.imanengineer.org.uk/under-served-and-wp**

Engineer activity

During the Zone the engineers interacted with students by writing 2,231 lines of live Chat, and providing 144 answers to 58 posted questions. On average, 5 engineers took part in each live Chat.





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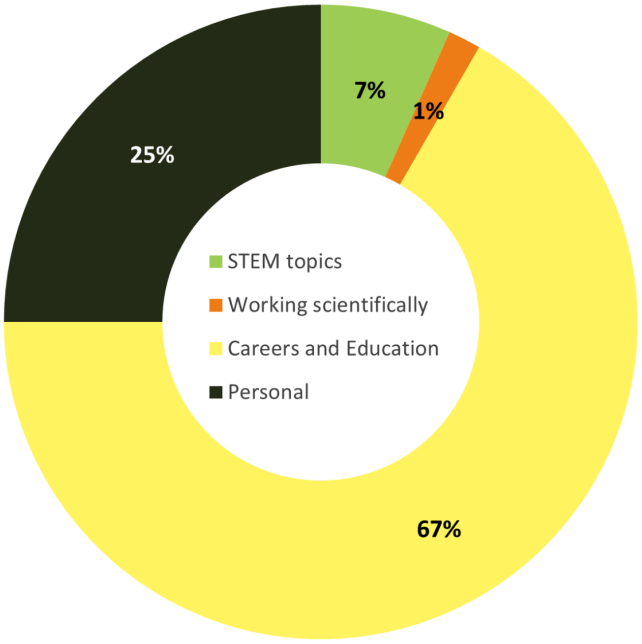
Live Chats

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

Questions in Ask section

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



How are electric cars CO2 efficient when the electricity comes from nonrenewable resources or the process of producing electricity releases carbon dioxide?

What is the worst thing about global warming?

What is your favourite CAD design and why?

How hard did you need to work in order to become an engineer?

What was your favourite subject at school?

Is your job difficult?

What is your favourite animal?

If you could change anything in the world what would it be?

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Good engagement

Asking questions they find interesting and relatable is important to support students' science capital[1] and makes them more likely to see science as something 'for them'. These interactions are especially helpful for students to see science as relevant.

Student 1: There's a lot of debate here about where we should put these windmills. Do you think it will be good for the environment?

Rebekah (engineer): It's a very interesting question! I think ultimately it is good for the environment to be moving away from drilling for oil and the emissions from fossil fuels. But, there are the concerns about birds, fish etc that people are doing research to minimise!

Student 1: How do they respond with snow and weather in the UK? Will your research help us?

Rana (engineer): Really good question! Like flooding research, some engineers also look at the ice/snow storms' impact on electrical power systems (transmission towers and lines). Such studies will help us resist the effects of the extreme weather.

Subject-specific questions are great to generate interest in the subject area and build on existing knowledge.

Student 1: What's the difference between a normal car and an electric car?

Rana (engineer): Electric cars run from the power of an electric battery. Normal cars have to burn hydrocarbons - which we would like to reduce moving forward

Student 2: In the future do you think electric cars will be less expensive and more affordable to buy ?

Rana (engineer): It has to be yes ! Because at the moment we are looking into hydrogen generated power and fuel cells which is much less expensive than using batteries

[1] about.imascientist.org.uk/student-impact

Student 1: Do you think the government invests enough in renewable energy?

Katherine (engineer): They have really increased funding, but I do think they could do more. For example, the tidal energy industry has a lot of potential, but needs more funding to further develop the technology so it can be rolled out at a commercial scale.

Student 1: Is this more than before we were in the EU?

Katherine (engineer): Good question- I'm not sure. But UK government renewables targets have rapidly increased this year with the drive to create more energy in the UK for energy security (driven by the war in Ukraine).

Information and advice about scientists' careers can show students the range of possibilities for working in science and what they need to do to get there.

Student 1: How long did you have to study for?

Emma (engineer): it really depends, i did 5 years at University (but I went in Scotland and think the degree is a bit longer there compared to England)

Student 1: Woah was that hard?

Emma (engineer): It definitely was hard at times! but I had a great group of friends and we supported each other through)

Student 1: Wow that's so fun

Student 1: How do you become an engineer and get to where you are now?

Rana (engineer): Thank you for your question. I did my High school Diploma taking all STEM subjects (Chemistry, physics, all Maths level) then did my Bachelor's degree in Electromechanical Engineering and Master's degree in Electrical Engineering. I'm currently working in London at BP as a graduate electrical engineer.

Student 2: What do you do as an electrical engineer in London BP?

Rana (engineer): Well I'm looking into all the basics of Electrical designs in the project and solve several issues in the current design before executing.

Conversations like this are great to build a rapport between the scientists and students. It encourages students to see scientists as "normal" people with interests and hobbies.

Student 1: What position do you play in netball?

Rebecca (engineer): I usually play centre or wing defence

Student 1: How long have you been playing?

Rebecca (engineer): I have been playing since I was about 8 or 9. Do you play? :) I am also an umpire!

Student 1: What's your favourite animal?

Emma (engineer): oh gosh, very tricky as i love animals. At the moment I think maybe pandas - I keep seeing clips of them online and they just seem very lovable!

Student 1: Awwww I love animals too. I would love to get a Monkey and a Nubian goat. I love the goats floppy ears and I just want to hold a little monkeys hand 😂

Emma (engineer): ooo cool! I've never heard of a Nubian goat - I'm going to have to look that up! haha monkeys are also very cute - very mischievous!

Student 1: I can never remember what they are called so I have to google floppy eared goats 😆

Emma (engineer): That's exactly what I'm going to do after this! :D

Engineers of the Week

Students voted each week for their favourite engineer to be named Engineer of the Week.

The Engineers of the Week were:

Rana Abdulla, Graduate Electrical Engineer at bp

Emma Farquharson, Process Engineer at bp

Engineer Winner

The overall winner, with the most votes at the end of the Zone was:

- **Paul James**, Mechanical Integrity Engineer at BP Sunbury

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

"For me this was a fun event and I had a great time communicating about engineering with all of your eager students. I hope we convinced you that there are great opportunities out there in the many different fields of Engineering (although we all know Mechanical Engineer is obviously the best 😊, – only joking, there truly are great opportunities in all fields!!!)"

You can read his full statement at
energy22.imanengineer.org.uk/2022/12/16/thank-you-from-your-winner-paul-james

Feedback

Thank you all for your time today. It's been fantastic!

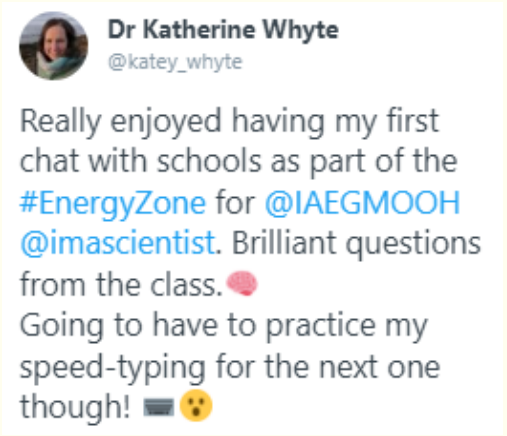
Teacher

I really enjoyed this and loved asking you questions

Student

Thank you for answering my questions, it was really helpful!

Student



All the children are having great discussions about your jobs.
This has been such an interesting and informative Chat - We are learning so much!!

Teacher

Thank you so much for engaging with my learners, they all enjoyed the experience!

Teacher

Thank you so much for all your help, I have learned so much and I'm so thankful for you taking the time out of your day!!

Student

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