June 2019

The Health Zone was a themed zone supported by Wellcome. It featured six engineers:

- Tonia Tzemanaki designs wearable robotic devices for healthcare procedures.
- Sam Gaughan uses computers models to learn about enzymes, so they can be used to make medicines.
- Emily McNee designs and develops skin cancer treatment products.
- Ejay Nsugbe, the winner of this Zone, works on prosthetics for disabled children.
- Edgars Kelmers is working to improve implants in hips and knees and make them last longer.
- Charnett Chau is working to ensure drug manufacturing and the use of plastic is environmentally friendly.

Key figures from the Health Zone and the averages of the June zones

PAGE VIEWS	HEALTH ZONE	JUNE '19 ZONES AVERAGE
Total zone	15,074	14,855
ASK page	912	1,164
CHAT page	1,342	1,425
VOTE page	1,435	1,442

	HEALTH ZONE	JUNE '19 ZONES AVERAGE	IAE 2012-19 AVERAGE
Health Zone Schools	11	11	11
Students logged in	343	362	400
% of students active in ASK, CHAT or VOTE	95%	93%	86%
Questions asked	227	461	582
Questions approved	122	177	224
Answers given	442	535	445
Comments	30	35	42
Votes	309	322	299
Live chats	19	18	17
Lines of live chat	7,112	6,808	5,577
Average lines per live chat	374	378	319

Popular topics

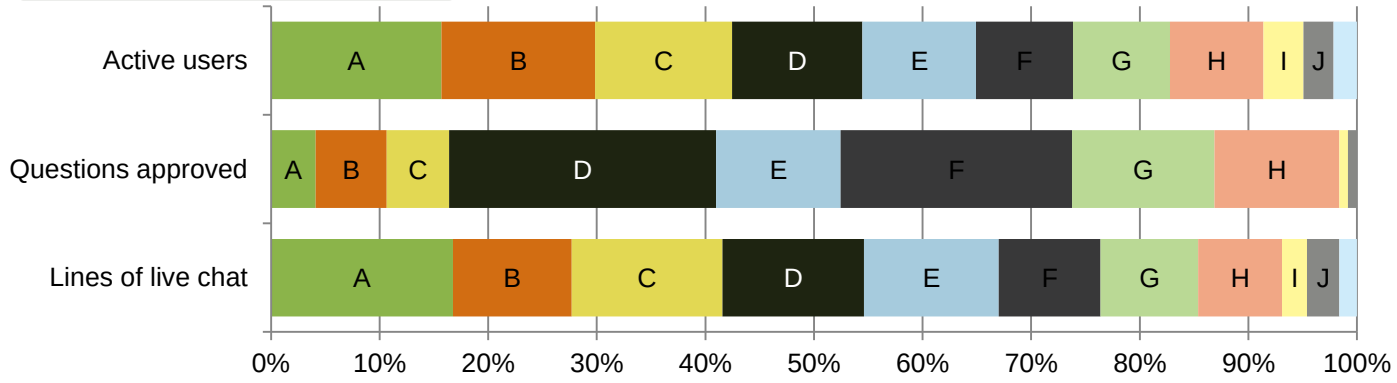
Students in the Health Zone were interested in the engineers' work and their links to the Zone theme. They wanted to know about the different materials the engineers use, such as in the implants Edgars works on and the prosthetics Ejay develops. Students asked about how devices such as prosthetics work, how they can move like natural limbs, and how many people need them.

There was interest in different diseases, especially cancer, relating to Emily's work on skin cancer. They were also excited by Tonia's work developing a robotic finger which led to questions about how robotics can be used to improve healthcare procedures.

There were lots of questions in ASK and the live chats about career paths and jobs in engineering. Students asked generally about how long it takes to become an engineer, different routes into the industry, and the qualifications that are needed; as well as personal questions for the engineers such as why Emily decided not to do a PhD, and why the engineers have specialised in their specific areas.

Engineers built a great rapport with the students, with one student logging into the evening live chat to tell the engineers: "I'm so determined to be on this chat with you guys. I'm in the hospital with a fractured ankle but I didn't want to miss the chat."

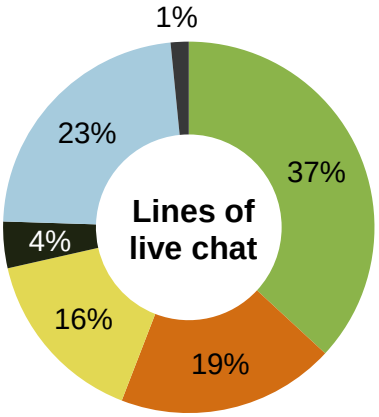
School data at a glance



	School	Year/s	Classes
A	Lancaster Girls' Grammar School, Lancaster	10	2
B	Orchards Academy, Swanley (WP/U)	9	2
C	The Charles Dickens School, Broadstairs (WP/U)	9	2
D	Darrick Wood School, Orpington	10	2
E	Llanyrafon Primary School, Torfaen (U)	5	2
F	Allerton High School, Leeds	7	2
G	Pitteuchar East Primary School, Fife (U)	5	2
H	The Rochester Grammar School, Rochester (U)	9	2
I	King James's School, Knaresborough (U)	12	1
J	St Francis Xavier Sixth Form College, London	12	1
K	Berkshire College of Agriculture, Maidenhead (SEN)	10	1

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

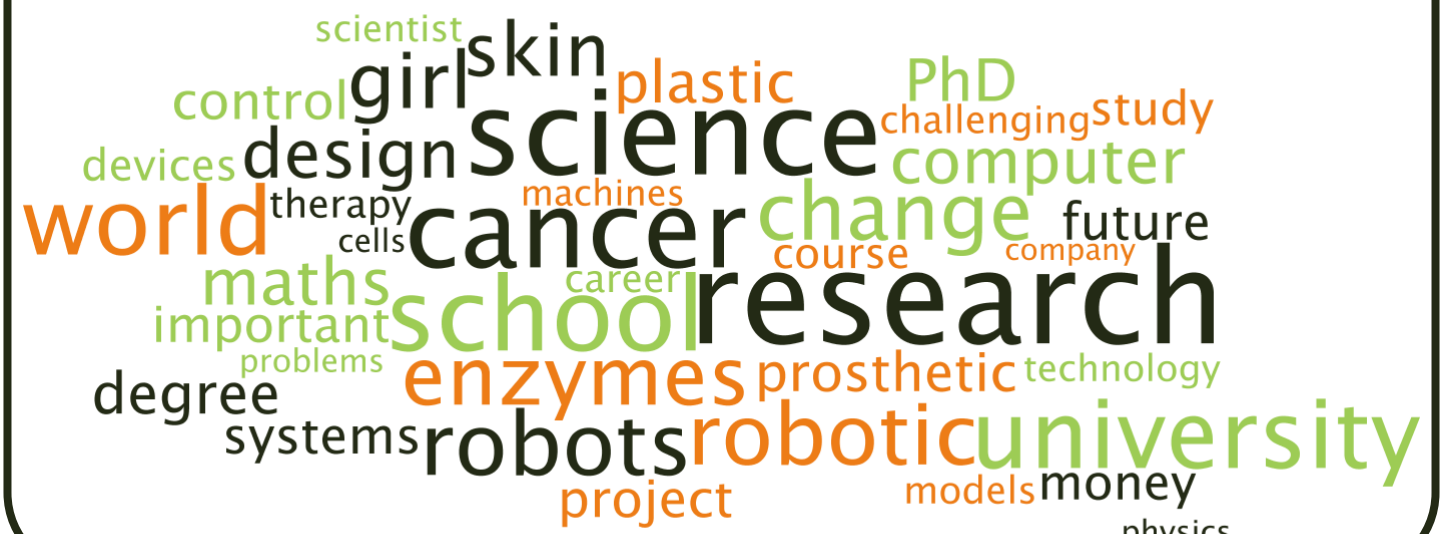
Engineer Activity



ENGINEER	PROFILE VIEWS	POSITION
Ejay Nsugbe	650	Winner
Emily McNee	560	2nd
Tonia Tzemanaki	482	3rd
Charnett Chau	461	4th
Sam Gaughan	407	5th
Edgars Kelmers	382	6th

Chat

Frequent words used in live chats by students and engineers. Size of the word represents its popularity



Question themes and example questions in the Zone

Find out about how we've coded the questions at **about.imascientist.org.uk/what-do-students-ask-about/**

How did you get so curious in the first place?

Do you like football?

Does x-ray therapy always work?

What materials did you use when you built the movement foot machine?

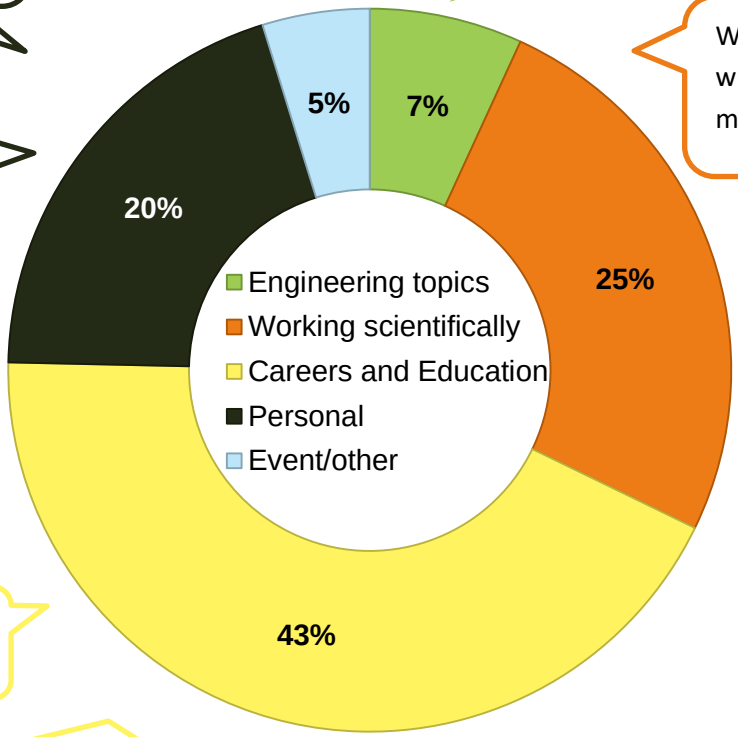
What are your views on Brexit?

Are there any engineering jobs that have something to do with sports?

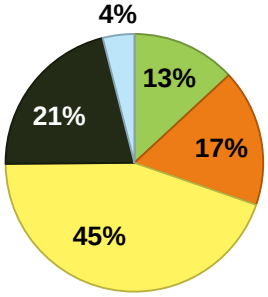
How do you make sure the production of bio mechanic limbs is sustainable?

What is the pay like as an engineer?

What general knowledge do you have to know before becoming an engineer?



Historic Per-Zone Average (Themed Zones)



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Health Zone

Supported by wellcome

Examples of good engagement

Engineers in the Health Zone were great at building rapport with the students. In this example, Tonia and Sam listen to students' thoughts on Tonia's work developing a robotic finger, and have an engaging conversation showing they value their ideas and responses. This experience supports the development of students' science capital:

> *"@Tonia We are all pretty curious, how would a robotic finger aid diagnosis exactly?" –* ***Student***
>
> *"So the doctor would wear a robotic glove which allows them to tele-operate the robotic finger. Then the robotic finger has sensors and sends this information to the robotic glove that the doctor wears. The doctor then feels what the robotic finger 'feels'. You can detect anomalies or tumours like that" –* ***Tonia, Engineer***
>
> *"Do you think people are going to be comfortable with being locked in a room with a robotic finger?" –* ***Student***
>
> *"Hahahah that is a great question. They will not be locked. They will be in the comfort of their own home hopefully and use the finger instead of going to an awkward examination room" –* ***Tonia, Engineer***
>
> *"Imagine a robotic finger, slowly creeping closer, and closer and closer..." –* ***Student***
>
> *"Hahaha no one will be stuck in a room with a killer robotic finger!! :PPP" –* ***Tonia, Engineer***
>
> *"What if the robotic finger got into the wrong hands, how could you trust that the person controlling this robotic finger wasn't hacked by some random person" –* ***Student***
>
> *"This is a valid concern! For the final product, there should be safety features that prevent such a thing happening" –* ***Tonia, Engineer***
>
> *"Things can still be hacked regardless of security and surely one person getting control of thousands of remotely controlled robotic fingers is a bit concerning" –* ***Student***
>
> *"I can see it now - "Antivirus for all your robot finger needs!" I'm not sure robotic fingers are the prime target for hackers to be honest. If they can hack that why not hack cars, websites etc. More dangerous/profitable." –* ***Sam, Engineer***

Engineer winner: Ejay Nsugbe

Ejay's plans for the prize money: "*I will run a live public demo to show how wearable sensors can tell us what happens inside our body, with my colleagues from the Institute Of Engineering and Technology. The purpose here is to show the impact of cross-disciplinary work of how the principles of Engineering, Physics and Maths can be used to monitor and explain human biological and medical phenomena without the need for an invasive approach.*"

Read Ejay's **thank you message.**

Student winner: jaycartwright

As student winner, jaycartwright will receive a gift voucher and certificate.

Feedback

We're still collecting feedback from teachers, students and engineers but here are a few of the comments made about June's *I'm an Engineer*…

"I have learnt a lot i now want to be an engineer :)" – **Student**

"The questions were really good, and made me think so much about what I do, and how my job affects others. When I am working with groups in the future, I now know what you guys want to know" – **Engineer**