

ACS STEM NEWSLETTER

Issue: January 2024

Trip to Queen Mary University of London, Mile End Campus

18 October 2023



On the 18th of October, alongside the rest of the Chemistry and Physics students I was given the opportunity to visit Queen Mary University of London. Our day consisted of a taster lecture on NMR spectroscopy, a tour of the research and computational chemistry labs, a tour of the physics labs and finally a tour of the campus, allowing us to enjoy both the academic and social life the university has to offer.

Although NMR spectroscopy is an A2 topic that we have yet to cover, Dr Chianello provided us with a fundamental understanding of one of the most difficult concepts in organic chemistry. During the lecture, he introduced the idea of spaced repetition with *Menti-meter*, an online platform that helped us better understand

the concept. Spaced repetition, also known as active recall, involves reviewing new material you have just learnt in a systematic way. This can be achieved through things like flashcards or mind maps. Online learners can also use apps such as *Anki* or *Quizlet* to review content on the go. Personally, I prefer *Quizlet* as you can find ready-made flashcards which you can use to create your own revision material. My suggestion for using mind maps effectively would be to first put down all the information you know about a certain topic, then using more specific terms and a different colour pen, write down any information you might have missed.

Overall this trip was a great opportunity to experience what studying a STEM degree at university is like, and I'm thankful I was able to learn more about how I can enhance my knowledge with revision techniques. (*Student, Year 13*)

Physics Astro Olympiad Challenge

November 2023

Throughout November 2023, our Science teacher Dr Mahmoud organised and ran a series of enrichment sessions for our KS3 and KS4 students to prepare them for the prestigious Physics Astro Olympiad Challenge, organised by the University of Oxford. 136 of our pupils

took part in the competition and we achieved a set of amazing results: 4 Gold, 13 Silver, 92 Bronze, and 27 Participation. Certificates were distributed to pupils in their science lessons or their celebration assembly. Many thanks to Dr Mahmoud for all his hard work in preparing the students.

Careers Fair

27/11/23



At the end of November, I was fortunate enough to be able to attend the careers fair at our school. Upon arrival, I was immediately engaged with the Robotics and Engineering stall, where I learnt many interesting facts about the system of trains from a member of the TfL. We also received some very useful sheets with websites we could research regarding different careers related to engineering. Unfortunately, I missed the robot demonstration due to the large number of

students interested in the demonstration, but I still had a great time visiting the other stalls, my favourite one being *Capgemini*. One reason I found the conversation with the *Capgemini's* representative particularly interesting was because he was one of our alumni. He also spoke in quite a relatable manner which allowed me to understand the world of work much better. Furthermore, when we asked him if grades matter, he assured us that as long as you're passionate enough about something, you can pursue any career, and this sparked my motivation quite a lot. At the end of the day, it was a very helpful experience, and I hope there will be more fairs like this in the future" (*Najihah, Year 11*)

Year 8 Assembly

29/11/23

One of the things I've learnt from the assembly was about the oil manufacturing and how the carbon dioxide released from waste gases affect the climate change, whose effects we can now see in various countries around the world, such as the flooding in Pakistan and India. The assembly was entertaining and we learned a lot about chemistry, physics and biology in a very short time, and it encouraged me to take

part in the science club on Thursdays. For next time, it would be useful if the assembly would talk about how our everyday lives are affecting the climate, such as the effects of using plastic bottles and plastic packaging and how hard it is to recycle these. If the assemblies could explain the scientific process of recycling, it would be very helpful for students and might encourage them to recycle more. (*Student, Year 8*)

The assembly was very useful and made me realised how important science is, and made me more likely to focus on science lessons and clubs in the future. (*Student, Year 8*)

Year 11 Assembly

13/12/23

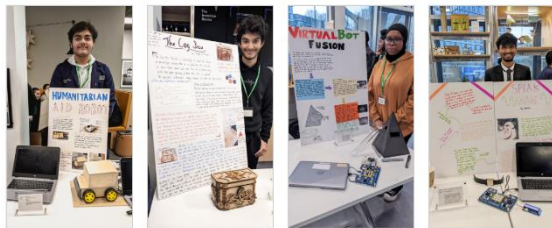
I enjoyed the assembly presented a few days ago as it was really interesting and it had a great message about how to become more resilient and that we should never give up. In the next assembly, I think I would like to see a video with the presentation as that might help students see how it relates to real life" (*Student, Year 11*)

The assembly left a lasting impression on me, particularly due to the passion and interest with which our Science teacher Dr Mahmud delivered the assembly. It brought to my attention the many spectacles in this world that I've yet to discover through science, as well as those I have already been fortunate enough to learn about during my time at school. An example of one of these unique opportunities was a masterclass delivered recently by two physics and

chemistry lecturers from Queen Mary University. The knowledge I have acquired allowed me to see science in a new light and approach it with curiosity and fascination. For the next assembly, I believe that displaying the latest advancements in technology might spark a further interest in students. I express my deepest gratitude to Dr Mahmoud for his diligence and continuous help." (*Iqra, Year 11*)

Year 12 Maker Challenge

November - December 2023



The experience at Imperial College London's Maker Challenge Programme was a riveting one, as we were taught how to operate many complicated machines such as 3D printers, laser cutters and working on CAD programmes. The 13-week challenge is split in two parts - the first half was spent on learning about how to use the different tools available in the workshop, and the second half we were given free agency to give life to our ideas. This could literally be anything from a line of code

operating a fully functioning Wall-E model, to a laser cut wooden puzzle box that opens with the turn of a master key. One of the most rewarding experiences, however, was the opportunity to meet so many different people who were all connected by a love for engineering and design. It is indeed the journeys we undergo and not their destinations that are the most valuable, and as much as I learnt about different equipment, I also learnt about different people.

The *Maker Challenge Programme* is a brilliant way to allow your creativity an avenue in which to roam wild, and it is an opportunity that is not to be missed, regardless whether you are a STEM student or not." (*Tariq, Year 12*)

Science and Food Tech Year 8

December 2023



In our school we always try to find and utilise opportunities that link various subjects closely together to form an enriching experience for our students. On Tuesday, 12 December students learned about the importance of yeast in their science lesson and its importance in food production, including making bread. This *minds-on*, theory-based learning was then combined with a *hands-on* approach to learning about yeast, where students were given the opportunity to make their own bread in food tech rooms; everyone became involved and engaged in this activity, as part of the *Science for all* programme. Thank you to Ms Merghani for allowing us to use the food tech room and for supporting us during her free period” (Dr Mahmoud, Science

teacher)

The bread was so nice and everyone liked it. The bread was in the shape of a circle - it looked good and it was delicious to eat. I was able to take the bread home with me and shared it with my sibling. I want to thank Dr Mahmoud for this opportunity.”

(Student, Year 8)

Masterclass on Waves and Photonics Year 11 and Sixth Form

19/01/24



Last Friday, I had the pleasure of attending a lecture delivered by Sylvie Higgs, Account Manager at *Sumitomo Electric Euro*, regarding the industrial applications and relevance of wireless technologies.

She began her presentation by discussing the core concepts behind photonics, namely, the various classes and properties of electromagnetic waves, how they are attenuated, and how we can modulate them. I appreciate how she answered all of our questions, in an easily digestible and straightforward manner that left little room for confusion. For example: “How does 5G differ from 4G?”, “What is the relationship between the strength of a signal and its range?” and “How are lasers involved in the manufacturing of silicon wafers?”. I enjoyed the segment where she

mentioned the uses of optics within self-driving cars (which many people believe will become as ubiquitous as standard vehicles), augmented reality, and facial recognition systems. This experience has prompted me to teach myself how to apply

the principles and methodologies associated with digital signal processing. All in all, it was engaging and fun, and I hope to meet more people like Ms Higgs during my time as a university student."
(Nachiket, Sixth former)

“In the masterclass, we learnt about electromagnetic waves which are part of our curriculum and about how different types of waves are used in our daily lives. We also learned about sensors, which are used in automatic doors. During the masterclass we also discussed about many careers in physics which can lead to high-paying jobs, such as a profession in radiology. We also talked about how only a small number of women are pursuing a career in engineering and physics, which hopefully it will change in the future.” *(Student, Year 11)*