

SCIENCE | TECHNOLOGY | ENGINEERING | MATHEMATICS





NEWS LETTER



12th October 2021 www.bexleygs.co.uk INTELLECT, EMPATHY & COURAGE

Sixth Form

Year 12 have the opportunity to hit the ground running in Maths and Science with Imperial's <u>Accelerate into Maths and Science</u> Programme. This is an after school programme that runs throughout the Sixth Form. It provides excellent support and inspiration for students looking to continue STEM subjects at university. Applications are now open! Good luck Year 12!

Another similar support project that BGS students have been involved in before is the Generating Genius Programme. This aims to promote students from African and Caribbean ethnic groups to follow STEM subjects into university. There is a strong emphasis on experiential learning with hands-on workshops, meet and greets with industry professionals and a log list of activities throughout Sixth Form. Find out more about the Uni Genius Programme for Sixth Formers <u>here</u>.



And for more general inspiration UCAS have listed all the virtual open days that universities are offering <u>here</u>. Although Covid-19 is preventing us from doing so many things, these virtual open days mean unis are potentially more accessible than ever! So whether you are starting Year 12 and need some inspiration and something to aim for, or you are just finalising your application in Year 13, this should help.

Key Stage 4

Year 11 has come back to school and hit the ground running. The Arkwright Engineering Scholarships are open again and we are looking forward to recommending students for this prestigious scholarship programme. It would be fantastic to continue the good record, we have



developed here at BGS with two Year 12 students currently awaiting mentors to be allocated. Unfortunately, this has been affected by the pandemic. So far, the Year 11 level of interest far out strips previous years and I am confident that we will be successful for a record number of consecutive years!

If you would like to know more about the programme, please click this **link** and contact me at **lusted r@bexleygs.co.uk** to be included in the application process.

Key Stage 3

With the current restrictions about students from different bubbles not mixing and teachers unable to safely monitor the use of practical equipment from within the 'teaching boxes' we have been unable to start the usual programme of science clubs. As an alternative I will be launching a virtual STEM club for Years 7-9. Keep an eye out for emails and items in the tutor notices.

The House STEM competition will be starting after the October half term. Year 9 students only will take part. I look forward to releasing more details closer to the time and seeing the fantastic creativity of our students in action!

We are still making strides in the efforts to link our school to the Twiga STEM club in Tanzania. As soon as we are able to run clubs involving students from different year groups we will be looking for keen thinkers, problem solvers and team workers from across the different year groups.

Ms Lusted, STEM Coordinator

Finally...

I know it has been mentioned many times before... BUT our certificate finally arrived from the Royal Society of Chemistry recognising the amazing efforts of our current Year 11 and 12s periodic table mural! Check out the framed certificate in the stairwell at the end of the M corri-dor!



Year 9 House STEM competition

Are you creative? A problem solver? Someone who can think outside the box and work in a team?

The Challenge

- In a team of three you will be given a few problems to choose from.
- You pick a problem and design a device to solve that problem.
- You make a poster and maybe a prototype of your design.
- Your team presents their design and model to the judges.
- The winning team gets glory and admiration... oh and house points!!

The Details

- Teams of three (make sure you have a mix of boys and girls).
- Meeting in **M16 on a Monday lunchtime** (you can bring lunch) for four weeks.
- Three sessions to design and create and one session to present.
- Starts Monday 9th November.
- Finishes Monday 30th November.

Ms Lusted, STEM Coordinator



I'm an Engineer, Get Me Out of Here!

On two consecutive Wednesdays M16 was bustling with the enthusiasm for the live chats with Space Engineers! Year 7 paved the way asking insightful and interesting questions. This was followed the next week by Year 12. In both



sessions I was very proud of how well our students engaged with the activity and managed to dig deep into the working lives of the engineers. It was a chance to find out about what it is really like to be an engineer working in the field of space exploration and investigation, and our students made excellent use of this opportunity.

On Wednesday 18th November, a group of Year 12 physics students and I had the fantastic opportunity to do a live chat with some space engineers and find out more about their careers. It was organised on the website 'I'm an engineer, get me out of here' where current engineers can sign up to volunteer for a text based chat with students who are interested in their field. We were very lucky to speak to four engineers: Marina, who studies landslides by using AI and satellite imagery, Tris, who builds science instruments for space missions, John, who works for the Airbus Space Engineering Academy and Yannick, who works on specialised sensors that detect radioactive material. The questions asked ranged from which subjects to take at school, to what the engineers like doing in their free time.* One thing that I learned from this session is just how diverse the field of engineering is, as well as how integral it is to our daily lives e.g. Marina is currently working on predicting landslides near a road in Spain that could save many lives in the future! It was also very interesting to find out about the amazing experiences that these engineers' careers have led to - during his career, John has broken a world record whilst carrying out a flight test of a new solar powered aircraft in the USA, as well as having visited schools with the astronaut Tim Peake's parents, while Tim was in space! This made me realise how exciting a career in engineering can be (who wouldn't want to meet Tim Peake!), and helped me to confirm that it is something I want to do in the future. I think everyone who came can agree that it was a very enjoyable and informative session, and that it was great to talk to real life engineers currently in the field. Thank you to them for this opportunity!

If you're interested in engineering as a career or want to find out more, check out the website https://imanengineer.org.uk. It is very easy to register and it will let you post questions to the engineers, vote for your favourites and even join the open live chat that takes place on Thursday's 7-8pm!

In case you're wondering, taking Physics and Maths is probably not a bad idea. And as for hobbies, Lego and building robots definitely came up!

Ugne Stanzyte, Year 12

I thoroughly enjoyed the chat with the engineers. We were warmly welcomed by the host of the room and then all of the engineers sent an introduction of themselves and their jobs into the chat. We asked an abundance of questions which were all thoughtfully answered. This experience was truly memorable as we were able to make contact with real engineers which had and are still working for recognisable companies such as NASA and the ESA (the European Space Association)! This was a once in a lifetime opportunity and I am extremely happy that I was part of this inspiring experience and I cannot wait to take part in future Science Club sessions!

Louis Luckman, Year 7

Live chat with Space Engineers Monday 18 October, H2 after school.

Quiz real engineers about their exciting jobs and how they became engineers in space exploration and astronomy.

A live text-based chat for 30 minutes with real engineers.

What will you ask them?

- Have you been to space?
- What subjects did you like at school? 0
- What do you like about your job?
- What is your day to day work like?
- How do I become a space engineer?! •

Students see Ms Lusted's email to take part

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Live chat with space engineers Week 1- Wed 11th Nov M16 start of lunch

Quiz real engineers about their exciting jobs and how they became space engineers.

A live text based chat for 30 minutes with real engineers.

What will you ask them?

- Have you been to space?
- What subjects did you like at school?
- Have you designed or built a rocket?
- How do I become a space engineer?!

Meets: Week B ~ Wednesday lunch in M16 (come at the start of lunch)

A science club with a difference!

Session 1 - Live online chat with real SPACE ENGINEERS

Session 2 - Come along to find out the fortnightly challenge. Watch a cool science demo then try it at home!

Session 3 - Share your experiences of the last challenge and find out the next one!



Students see Ms Lusted's email to take part

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STAR STUDENTS OF THE WEEK

STEM Star Students news

The House STEM competition was finished and judged in the last week before Christmas. Parent-governor Mr Mike Woodhall, cast his expert eye over their designs and watched presentations. We their really appreciate the time he took to give detailed and constructive feedback to each team. Every team produced original work and presented with enthusiasm and professionalism, I was very proud!

Here are the winning designs.

- A design for a crazy golf hole by Jay Renoo, Vivian Kellman and Adam Mawdlsey

House	Place
Kirkman	1st (30/35)
Johnson	2nd (29/35)
Mabbs	3rd (28/35)
Collins	Joint 4th (26/35)
Prothero	Joint 4th (26/35)
Wellman	5th (25/35)







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STEM And the feedback for Kirkman:

This idea is immediately engaging and the prototype is well constructed. It is a great example of a minimal viable product (enough detail to get feedback on the idea and decide whether to move to the next stage of development). The use of the materials in the prototype was well thought through and sufficiently robust to show the process. The presentation was fantastic - very clear and it is great to see something in action, and what it could look like in real life. It would be a fantastic hole to play!

Mr Woodhall

Johnson- A design to lift schoolchildren up to the top of a cliff for a rural school by **Ravi Bhat** and **Amelie Leachman**

And the feedback for Johnson:

This is a wonderful example of lateral thinking - rather than just improving what was already there (build a better ladder or bridge) you have come up with a design that works in a radically different way. The drawings you have developed are very clear and I think the design you have come up with would be a fantastic way to get to school! The use of hydro-electrics is innovative and the safety features are well thought through. It would be really interesting to see if you could take this idea and see if there is a way to develop a simple prototype that could be tested! Great job Amélie and Ravi.

Mr Woodhall

Well done to all teams. It was great to be able to complete this house event in the short window we were in school.

Ms Lusted, STEM Coordinator





STAR STUDENTS OF THE WEEK

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National Careers Week



Hitish Science Week 2021



To mark these two events BGS have invited students in Years 9-13 to join in a range of virtual panel discussions on careers in STEM fields.

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The timetable is as follows:

Years 9 and 10 only Robotics and AI (Wed 3rd March 2-3pm) Physics in Medicine (Fri 5th March 2-3pm) These are from the Institute of Physics, more details **here**.

Years 11 -13 Pathways into STEM (Wed 3rd March 2-3pm) This is being provided by **inspiringthefuture.org**

Please see Ms Lusted's email if you wish to attend.

Also you may be interested in visiting the National Careers Week website **here** to see if there are any other videos or activities that are of interest to you. There is even a very extensive virtual careers fair.

British Science Week for the Lower School

Additionally some further activities have been planned for the lower school to mark British Science Week. Here is Science Prefect Emilio Mendoza to tell you a bit more about it (the link to the experiments will be sent out next week):

Science Week is coming everyone! Throughout the 5th March until the 11th we encourage everyone to take part in fun and interesting science experiments that anyone can do at home with just regular, everyday equipment! These activities will show you how amazing the world of Science is and how it is not limited to the Science lab in school, it's everywhere! You can find many incredible experiments on YouTube that are safe and easy to do with the whole family or by yourself, but remember, these must be done responsibly and with care for them to work and so you can have the best experience making them.

On that note, have fun and experience the beauty of Science first hand in this year's Science Week!

Emilio Mendoza





British

Week

Science

-14 March





On the 3rd and 4th of March the Year 8 students will be taking part in a **Marine Engineering Workshop**.

Science Book Awards

seafarer

The Royal Society is running a Young Person's Science Book Prize. There will be a Virtual Book Awards held live on YouTube with the possibility of joining in a Q&A with the authors at the end. We would love to get year 7 involved, reading the books and posing questions to the authors at the Q&A session.

The list of books has been shared via their google classrooms and have been promoted for their library lessons. I know a few of them have been really enjoying reading these books. Here is the full list and you can read about each in more detail **here**:

- Neil deGrasse Tyson Astrophysics for Young People in a Hurry
- Izzi Howell Cats React to Science Facts
- Stella Gurney (Libby Deutsch) The Everyday Journeys of Ordinary Things
- Katie Brosnan Gut Garden
- Barry Marshall FRS How to Win a Nobel Prize
- Aimee Lucido In the Key of Code

Here is a book review of Aimee Lucido's In the Key of Code by Karan Abrol (7AJW).

In the Key of Code by Aimee Lucido is a story about 12 years old Emmy who moves from Wisconsin to San Francisco because her father gets a job at the San Francisco Symphony Orchestra. Both her parents are musicians, but despite her many attempts at learning music she never really feels that she is any good at it. Starting a new school, she's lonely and doesn't feel she fits in. She plans to take an elective in music but as too many people were taking it, she ends up in Computing. She starts to enjoy it and discovers that she is good at it and joins a coding club after school.

Emmy meets Abigail when she is secretly changing her elective on the board, Abigail signals her to keep quiet about it. They soon become best friends through their shared interest in coding. It's an inspiring story written in verse and javascript and although initially I found it strange to read, I soon got the hang of it. Emmy was curious and asked her teacher Ms Delany if she can play music in code and learnt that she can. She realised she enjoyed it and was good at it. She felt that she could be good at something too and wasn't lonely anymore. I would say that it is a feel good book with a message that everyone is good at something that makes them happy. I also enjoy coding although I'm not that good at it yet.

I hope to hear of lots more Year 7 students enjoying these books and taking part in the virtual event. I will be emailing out more details next week.

Ms Lusted, STEM Co-ordinator

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British Science Week is here! I can't believe it is a whole year since the last one, when we were just starting to hear of schools shutting across Europe and wondering if we would do that too. So much has happened since then!

Despite the phased return to school clashing with our Science Week plans the students have still been getting stuck in with a range of activities over the last couple of weeks.

Years 9 - 13

A schedule of inspiring STEM talks with ambassadors in a wide range of fields has taken place. Robotics and AI as well as Physics in Medicine were options for Years 9 and 10 to attend, while Years 11 - 13 joined a panel discussion on 'Pathways into STEM'. Year 12 also took part in a live chat through 'I'm an Engineer Get me Out of Here'. Students were able to chat directly with real chemical engineers who could give them invaluable insight into a career in that field. It was fantastic to see so many take part and hear from the inspiring speakers.



The Zoom live about Physics in Medicine was very eye opening because it really portrayed that there isn't just one aspect to medicine such as what substances to put into a medicine which is more chemical, but that there is so much more like the machines that are needed and how there are so many more aspects such as radiation. They exemplified how many interesting aspects there are too. When we think about medicine it is just the generic journey of going to a doctor, getting prescribed something, going to the pharmacy and getting the medicine, but actually they informed us that there is so much more like the use of radiation which was told by Lauren Bryne. She told us about how radiation is used in x-rays, but also how there are these pills that contain radiation which someone can take that kills cancer internally.

However, one thing that really stood out to us was the inspirational story Jamie Mewburn-Crook gave us. Jamie is a nuclear metrologist; accurately measuring radioactive material to make sure nuclear medicine and power plants are safe. He began working at the National Physical Laboratory at the age of 16. Some of his work includes antiviral materials for use in the pandemic, creating CE certified PPE for NHS staff as well as winning Apprentice of the year for his work in 3D printing for cancer research. Jamie is dyslexic which led him to struggle at school. He shared stories with us and informed us on how in Secondary school he would always understand what he learnt, but never did well in the tests. This was quite a wake-up call to most people because usually whenever someone doesn't achieve the score they want on a test they may start to feel scared because they start to think that they will never get anywhere in the future and no future employers will want them. However, Jamie depicted to us how that is not the case and he conveyed to us how you should always be resilient and not to give up. Don't let the fact that if you have some learning disabilities or you are not the brightest in some subjects stop you from dreaming big.

Gunit Kaur and Agshana Jegatheesan, Year 9

There was a pathways to a STEM webinar that some students attended and it was really great. There were 4 really interesting different career worlds including someone who had pursued a career in finance management, a mechanical engineer, someone with an engineering degree who pursued a technology career with Sky and an engineer who worked with the Navy working on aeroplanes and currently working on investigating crashes. It was a really useful experience and they gave us some insight into the flexibility of STEM careers and how you can manage your career to fit your dreams and capabilities even as they change, most of the volunteers spoke of ways in which they had been challenged and succeeded or

how they had been able to adapt themselves and their situations using the many skills they've acquired. Overall it gave me more confidence in my aspirations as they showed how STEM careers aren't linear and that they allow you many opportunities. *Lauren Dempsey, Year 12*



Years 7 and 8 Science Week Activities

All lower school students are invited to take part by completing home experiments with things you would normally find in the home. This has been organised by our Science Prefects and here is Emilio to explain more:

Hi Everyone,

Science Week is here! This week, you and your family or friends can see just how amazing science can be. You don't have to be in the school lab to do science, it can be done at home with everyday equipment and with your family!

Below is one video out of hundreds that shows you how to do easy experiments from home, and I promise you will be amazed. Have fun everyone and see just how cool science is! **Here is the video we recommend**.

Emilio Mendoza, Year 12

Science Book Awards

The Royal Society is running a Young Person's Science Book Prize. There will be a Virtual Book Awards held live on YouTube with the possibility of joining in a Q&A session with the authors at the end. Unfortunately, as we are now back in school we will not be able to watch the awards live, but it will be available to watch afterwards. The Royal Society has its own YouTube channel which can be found <u>here</u>.

Even if we can't join the live Q&A session we have still been promoting the reading list and I have been incredibly impressed by the enthusiasm of Year 7 students and a number of them

have read all the books on the list! Here is a short synopsis of each by Scientist in Training

Millie Laming , 7REL

Gut Garden by Katie Brosnan

This book is very detailed and gives a great insight into the wonderful world of the microbiomes living in your body and their jobs in the body. It is very fun and there are facts that are surprising and cool- great read!

Cats react to science facts by Izzi Howell

This book is great for anyone who loves both cats and science. It is very unique and unlike most books in the way of its surprising facts and meow factor! Amazing read and covers almost all areas of science.

How to win a Nobel Prize by Barry Marshall

This book has great ideas for experiments you can do and is based on a real girl asking the author real questions. The time travel that unfolds is very insightive and tells you about old Nobel Prize winners and how they won them, giving you advice and explaining their theories. Such a good book, really recommend it!

Emmy in the key of code

This story goes through the feelings that any new child at a new school experiences, especially in the building of new friendships and starting a new club. The story is poetry-styled and is heart-warming as Emmy learns the key behind code. This book is great for anyone who loves computing or wants to read some great poetry.

Astrophysics for young people in a hurry by Neil DeGrasse Tyson

This book explores the physics behind outer space and the big bang that started off the universe, among other things. It is very detailed in its explanation and yet also broken down into bite size bits for young scientists. The photos and detailed fact boxes also help explain what Neil is describing. Neil is a great scientist and helps the complex mysteries of outer space to be explained to the newest generation of scientists.

Year 8 took part in a virtual Marine Engineering workshop last week. It was really interesting and made for a different home learning experience!

Ms Lusted, STEM Coordinator









British Science Week 5-14 March 2021

For most of the spring term we have been practicing distance learning which meant we have had a lot less interaction with our teachers and friends but towards the end of the home learning was British Science Week from the 5th to the 14th of March and Mrs Moore organised science and stem focused activities for us to participate in.

We attended online webinars through the organisation "I'm a Scientist" which is a graduate student led company that runs STEM enrichment programs and connects students with professionals within the science and STEM community from all around the world.





These scientists, researchers and engineers volunteer to attend webinars in which students may ask questions about their careers and interests in live, real time chats as a way for us to shape our understanding of the STEM world and the wide range of paths that we may take.

The chemistry focused talk we attended was led by 5 scientists whose careers and areas of research spanned from the commercial production of drug molecules and drug testing to the study of cancer to measuring volcanic gases from Space and researching the production of nitrogen without a carbon dioxide by-product. It was really helpful getting the opportunity to speak to scientists from very different areas of STEM to help us really start to understand the different routes we might take in the future and I think everyone had at least one scientist to talk to within a career they might aspire to. Within these chats we got the opportunity to ask questions based on the volunteers' profiles and they answered loads of the different questions we sent in lots of detail.

In particular we asked many questions about how they became interested in their career paths and advice on choosing university courses and they gave many useful responses saying that the research conducted at different universities or the practical components of different courses may affect your university choices but they also spoke on how you could also enter stem through apprenticeships and they stressed how as scientists they are constantly learning and teaching each other in ways that they never even considered. We were also very interested in what the everyday work in these careers looked like and how these different areas had been impacted by COVID-19 which has left many people working from home and has possibly changed the way in which we can collaborate and work as a team forever.

It was really cool how these professionals took time out of their day to speak to us and overall it was a brilliant opportunity giving us an insight into the world of STEM outside of the classroom and answer our questions with interesting and useful answers. Did you know that teratomas (a type of tumor) sometimes look like human body parts because the cells they originate from are stem cells which can become different human tissues?!

I know that it definitely made me feel more secure in that many of them didn't have careers planned out and sometimes struggled with science at school and it was a really great opportunity.

Lauren Dempsey, Year 12

Chemistry Olympiad Competition 2021

This Year, our Year 13 students completed the Chemistry Olympiad Competition. This of course had logistical issues with Mrs Moore having to monitor students remotely during the 90 minute paper. A huge congratulations goes to Samuel Gee, who achieved a gold certificate, which is the highest honour. Only 8.9% of students achieved this in the international competition, which has over 7000 participants. We are so proud of Sam's great achievements throughout his time at Bexley Grammar School and we look forward to hearing about his success in the future!

Mrs Moore Lead Teacher Chemistry



NEWS



25th March 2021 www.bexleygs.co.uk

Royal Society of Chemistry Schools' Analyst Competition 2021

This year Bexley Grammar was selected as one of 200 Secondary Schools to participate in the Royal Society of Chemistry Schools' Analyst Competition 2021. All Year 12 Chemistry students participated which allowed them to develop their collaborative, analytical, logical and general practical skills. Thank you



to all of our students for taking part. The organisers stated that it was a very tight competition and I'm very impressed with the overall quality of the entries. Unfortunately we did not win the South-East regional heat, but I wanted to say congratulations to Lauren Dempsey, Aimee Norman, Maddy Eldred and Anushdikka Antonyogarajah who achieved the best score from BGS.

Mrs Moore Key Stage 5 Leader Lead Teacher Chemistry



Cambridge Chemistry Challenge Lower 6th

On Thursday 25th June, the following Year 12 students took part in the Chemistry Cambridge Challenge; Miriam Basheer, Kweku Brobbery, Weronika Bucko, Lauren Dempsey, Max Hickman, Victoria Joyce, Emilio Mendoza, Dilshanth Nagulathas, Alejandro Obeso Foreno, Emilija Verbaityte and Simon Woods.

The students completed a particularly challenging 90 minute paper with questions ranging from thiocyanates to oxidation, reduction and ferrets!

Congratulations to all students who participated and in particular to Weronika, Lauren, Dilshanth and Simon who achieved the Copper Award.

Mrs Moore, Key Stage 5 Leader, Lead Teacher Chemistry





Cambridge Chemistry Challenge Lower 6th