Science and engineering week March 2021

HIGHLANDS SCHOOL



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Twitter: @Highlands_sch Instagram: @highlandssch At Highlands School, this week we celebrated National Science and Engineering week 2021.

Through this week's assembly students were introduced to the world of STEM (science, technology, engineering and mathematics) and the exciting career paths these subject areas can lead to.

Since the focus was on engineering, we shone the spotlight on the triumphant and successful landing of the Mars 2020 Rover Perseverance through showcasing the amazing aerospace engineering team who made the landing an astounding success.

Year 7, 8 and 9 students marked this momentous occasion in the classroom learning about engineering (specifically aerospace engineering). They also got to watch a Q and A session that Dr Len had with an aerospace engineer and even designed their very own aeroplanes and Mars Rovers!



What is STEM education?

STEM Education, at its core, simply means educating students in four specific disciplines, namely, science, technology, engineering, and mathematics (collectively shortened to STEM).

Instead of training students in any one of these domains, STEM combines all four in an interdisciplinary and applied approach. This better equips students to have a career in STEM and consider real-world applications.

In school students get to apply the various domains of STEM in a context that helps them realise a connection between what they learn in the classroom and the world around them.

Why is STEM important?

STEM careers

- There will be 142,000 new jobs in science, research, engineering and technology from now to 2023.
- Future jobs could include; computer coders, geotechnical design engineers, intelligence consultants, robotics engineers, data scientists.
- Jobs in science, research, engineering and technology fields are likely to grow twice as fast as other careers (6% vs 3%), driven by factors including the pace of infrastructure investment and digital innovation.

Bringing down the gender pay gap

• Getting more girls to consider these careers is essential to the success of UK industrial strategy, currently, women are less than a quarter of the workforce in four of the five most in-demand industries.

Skills shortage

• Current figures show there will be a shortfall in the number of graduates and apprentices available to fill these roles. For example, there will be a 40% shortfall in engineering.





Careers in STEM

There are hundreds of exciting jobs that use science, technology, engineering and maths. Below are some examples from people who use their STEM skills for different jobs at Practical Action.



GITA

A love of numbers and computers has led me to a job where I travel all over the world. I get to see the amazing work being carried put by Practical Action.

LUCHO

International co-ordinator for markets and livelihoods programme

'The most rewarding part of my job is seeing people in developing countries use our as to improve their lives.'

Find out more about the people who work for Practical Action by visiting our website www.practicalaction.org/schools/stem-careers

Practical ACTION

A career in engineering

Please follow this **<u>link</u>** to find a flow diagram that illustrates the different routes you can take to get into an engineering career.

If you have an interest and have an aptitude in maths, science and technology, then engineering may be a good career choice for you. Engineering contains a large number of job opportunities and specialities.



£29,000 - £60,000 a year (UK average)

Chemical engineers are sometimes known as 'universal engineers' because they have a broad range of knowledge and have their fingers in all kinds of career pies. For example, the Nike sportswear development department is full of chemical engineers helping to create space-age fabrics. Chemical engineers research and design the machines, chemicals and activities which help create products from raw materials. Chemical engineers even help design ice-cream!

Civil Engineering

£24,000 - £80,000 a year (UK average)

Civil engineers are like Sim City but in real life. They plan and manage mega building projects – anything from airports to statement skyscrapers and entire new towns. If you want to be able to walk past a city attraction and tell your friend "I made that happen", you could think about becoming a civil engineer.

Electrical Engineering

£20,000 - £60,000 a year (UK average)

Would you like to change the world, improve lives and save the planet? Would you also like to make your tired old phone scratchfree again? As an electrical engineer, dreaming up and making all kinds of electrical equipment is what you do. You don't need a degree to get into electrical engineering, either. You can start out as an electrical engineering technician then train to become a fully qualified engineer when you're ready.

Mechanical Engineering

£22,000 - £55,000 a year (UK average)

Mechanical engineers hold the skill of designing machinery and mini-machinery-bits (components, in other words). You'll find machinery everywhere these days, so mechanical engineers are needed in almost any industry you can think of, from energy to healthcare.

Interview with an engineer

Dr Len was very excited to have the opportunity to have a Q and A session with Mr Paul Kaing, who is a Mars robot operations architect/engineer at Airbus.

Paul spoke about his role in being part of the team that helped to successfully engineer the 'Mars Rover 2020 Perseverance' and what an exciting time it is to be involved in the world of aerospace engineering.

He also discussed people who inspired him, such as one of his lecturers/mentors at Cambridge University Aerospace, Physicist Dr Julia Riley, who had a group of galaxies named after her!

This week year 7, 8 and 9 students were able to watch this Q and A session during their National Science and Engineering week appreciation lessons.



Mr Paul Kiang, Mars robot operations architect/engineer



Dr Julia Riley, Aerospace physicist

Medic, Dental and Veterinary Mentor and Allied Healthcare Mentor

It has been a very exciting year for the STEM department, we've been able to offer our students some amazing opportunities, such as; STEM career conferences and work experience. We continue to foster the fantastic collaboration that our school has with the Medic Mentor (MM) and Allied Health Mentor Programme.

Medic Mentor is a non-profit national medical organisation for applying students, medical students and doctors. They specialise in helping students to get into medicine, and award students with merit-based scholarships to study medicine at university. Medic Mentor is run by a UK-wide network of volunteer doctors who provide UCAS support and teach medical students how to become successful future doctors and NHS leaders. It is an organisation that re-invests in the wellbeing and morale of our UK's doctors. So by getting involved in Medic Mentor, not only can you learn how to successfully become a doctor, but you are also supporting our medical students and doctors, whilst getting into medical school.

We currently have 27 students who have undertaken and are continuing the virtual medical programme that was showcased at our last science assembly. Last week we were very fortunate to have the head of 'MM' do a live Q and A session with our sixth form students, discussing medical career paths. Some great questions were asked and students walked away with a better understanding of what the profession entails as well as other allied healthcare career paths.

Medic Mentor has now branched out and initiated Dental and Veterinary Mentor, which is exactly the same program but directed at aspiring dentists and veterinary doctors.

I am delighted to announce that they are now offering live work experience for students from year 10-12. Students should check their Google classroom announcement for more details on how to register.

All these career fairs, workshops and mentoring programs will continue to be made available to all of Highlands School's students as they enter the upper-year groups at school. They are free to attend, unless otherwise specified. So watch this STEM space for future announcements through your science Google classrooms and school newsletters.





SPECIAL FEATURE NEWSLETTER

19TH MARCH 2021

Exploring Mars

Mars 2020 Perseverance Rover 'HIGHLANDed' into our classrooms during National Science and Engineering Week 2021. On the 18th of February 2021 the biggest, heaviest, cleanest, and most sophisticated six-wheeled robot ever launched into space and landed on Mars.

The Mars 2020 Perseverance Rover is designed to better understand the geology of Mars and seek signs of ancient life. The mission will collect and store a set of rock and soil samples that could be returned to Earth in the future. It will also test new technology to benefit future robotic and human exploration of Mars.

Many talented engineers and scientists from around the globe and at NASA have worked in collaboration to see this Mars exploration project become a success. At Highlands one of our STEM aims is to promote engineering to our students and make it accessible to all.

In the UK only 11% of our engineering workforce is made up of women the lowest across European countries and the UK. Moreover, 20% of A level physics students are female and this number has not changed in the last 25 years.

Since it was International Women's Day on the 8th of March last week, it was fitting to be able to celebrate the triumphs of the female aerospace engineers who lead the engineering and design team for Mars 2020 Perseverance Rover.

This week year 7, 8 and 9 students were given the opportunity to explore the world of engineering. They immersed themselves in this field by exploring what engineering is and the different types of engineering career paths that are available, be a part of a Q and A session with Dr Len's friend Mr Paul Kiang who is an aerospace systems architect and build paper aeroplanes to look at the connection of design and speed.

The paper aeroplane that flies the farthest for each class wins a prize, so watch this space for winning entries.

Students were also able to learn about the different rovers that landed on Mars, what their goal was on Mars and what was taken into consideration when designing the rovers.

They then designed their own rover using the knowledge they've learnt about Mars and how to successfully design. Rover designs will also be judged and the best one per class will win a prize.

Winning designs for both the paper aeroplane and rover will also go in the school newsletter!





