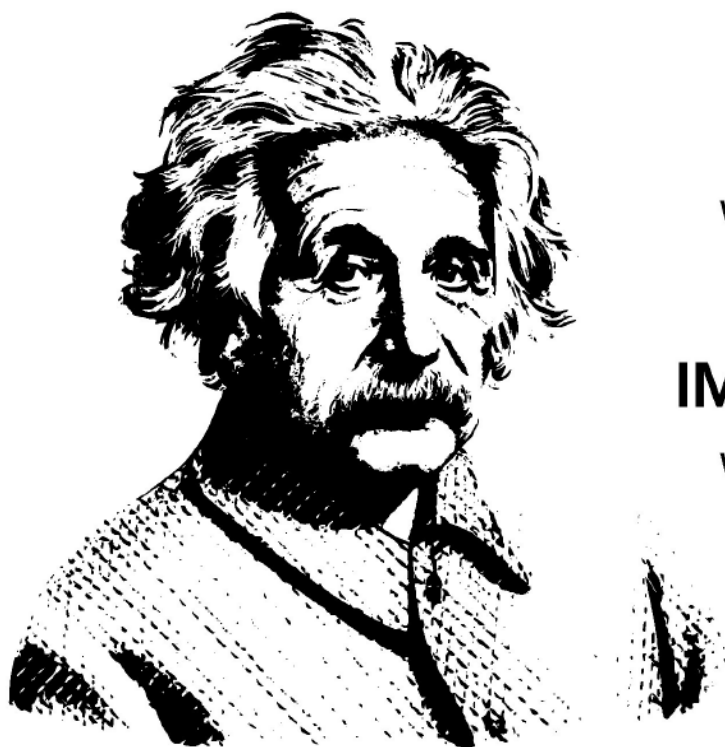


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SCIENCE

@CHS



LOGIC  
WILL GET YOU  
FROM A TO Z.  
**IMAGINATION**  
WILL GET YOU  
EVERYWHERE.

Albert Einstein  
(Nobel Prize in Physics 1921)



# SCIENCE PROSPECTUS CONTENT

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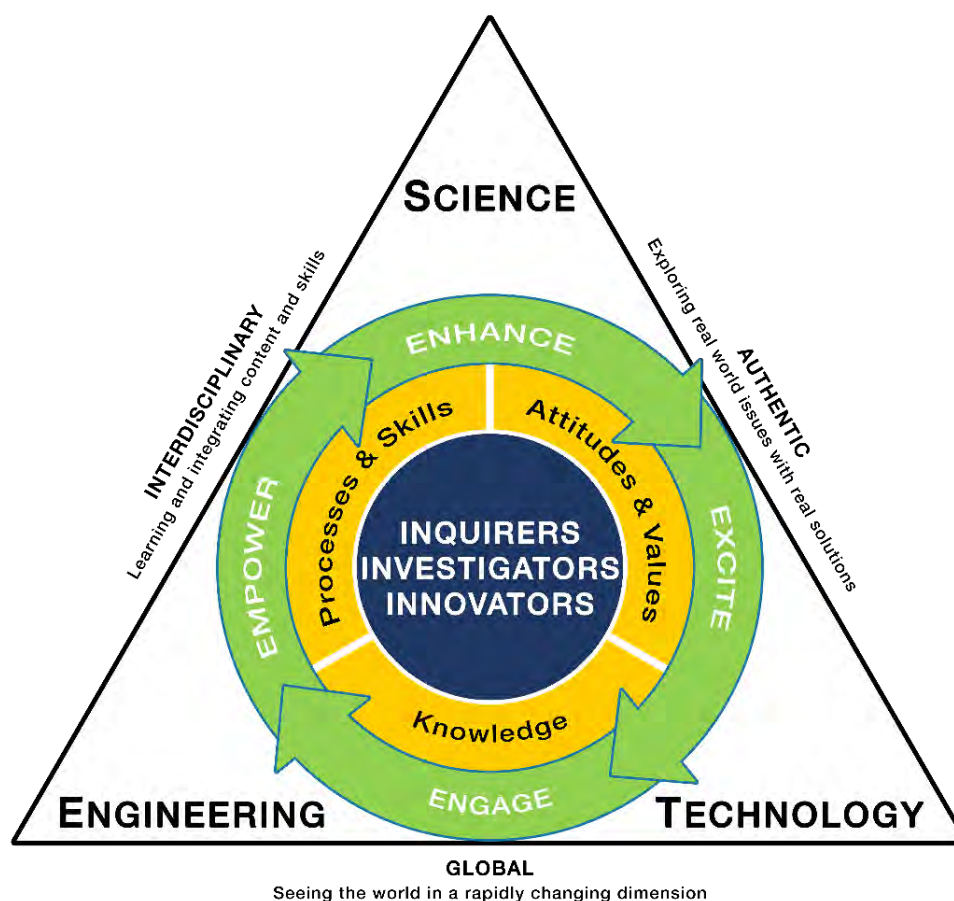
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OUR VOICES

# OUR APPROACH

At the heart of our interdisciplinary science curriculum are 4 E's: **Enhance**, **Excite**, **Engage** and **Empower**.

Our programme **enhances** the learning of science through the removal of traditional barriers. Science is exploratory and must stimulate students' curiosity and motivate them to be **excited** to find out more. We believe **excitement** is the first step to **engage** students' learning. By **engaging** in authentic real-world scientific and technological problems, students may then recognise that science and engineering can help solve major challenges that confront society today and in future. Our rigorous science programme seeks to create learning experiences through numerous platforms in order to **empower** our students to use their talents and skills to benefit the community and beyond in a rapidly changing world.

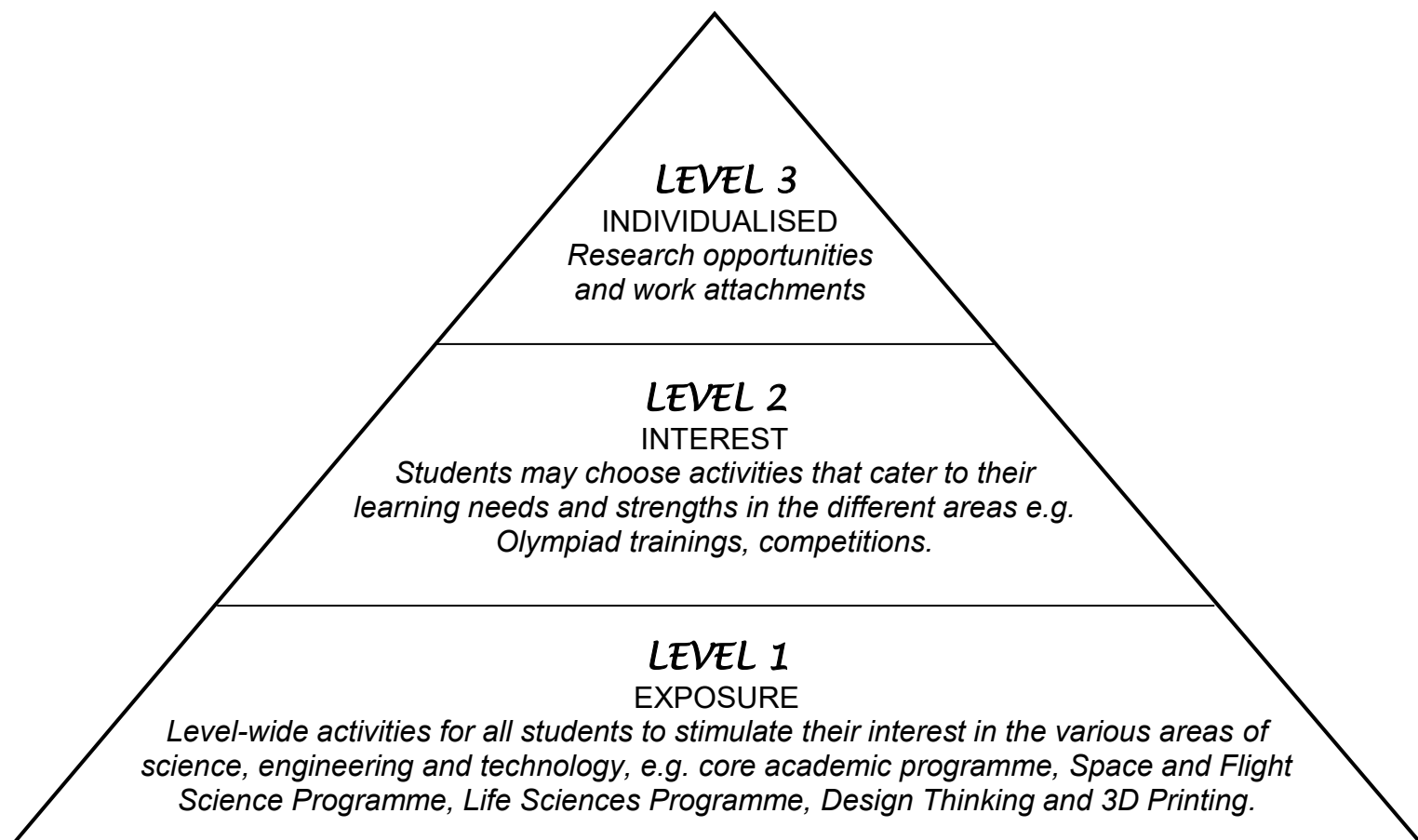


DIMENSION	DESCRIPTION
<b>Interdisciplinary</b> Learning and integrating content and skills	<ul style="list-style-type: none"> <li>Exploring the connections between science, society and environment</li> <li>Adopting scientific approach and knowledge to solving problems and challenges</li> </ul>
<b>Authentic</b> Exploring real world issues with real solutions	<ul style="list-style-type: none"> <li>Contributing to the progress of science knowledge e.g. research projects</li> <li>Engaging in higher-order thinking and inquiry skills through use of real-world contexts</li> <li>Thinking and working like a scientist</li> </ul>
<b>Global</b> Seeing the world in a rapidly changing dimension	<ul style="list-style-type: none"> <li>Using educational technology to support teaching and learning</li> <li>Exploring international examples and events</li> </ul>

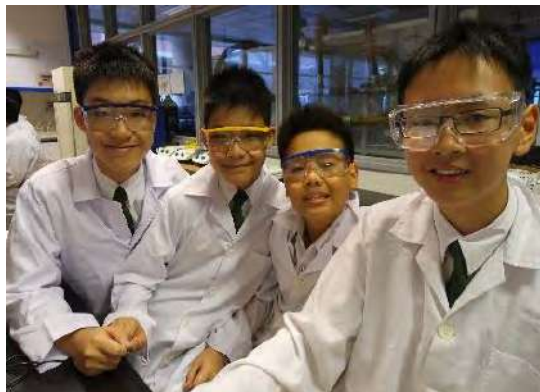
# OUR APPROACH

Many of our programmes cut across the dimensions of **interdisciplinary**, **authentic** and **global**, to deepen and enhance students' experiences in science learning at all levels depending on their readiness and ability.

This talent management programme aims to identify and harness talent in science through a structured programme of learning opportunities both in and out of class. The programme not only allows for learning experiences beyond the classroom boundaries, it also serves to complement and reinforce the core curriculum and classroom instruction.



PET water rocket workshop

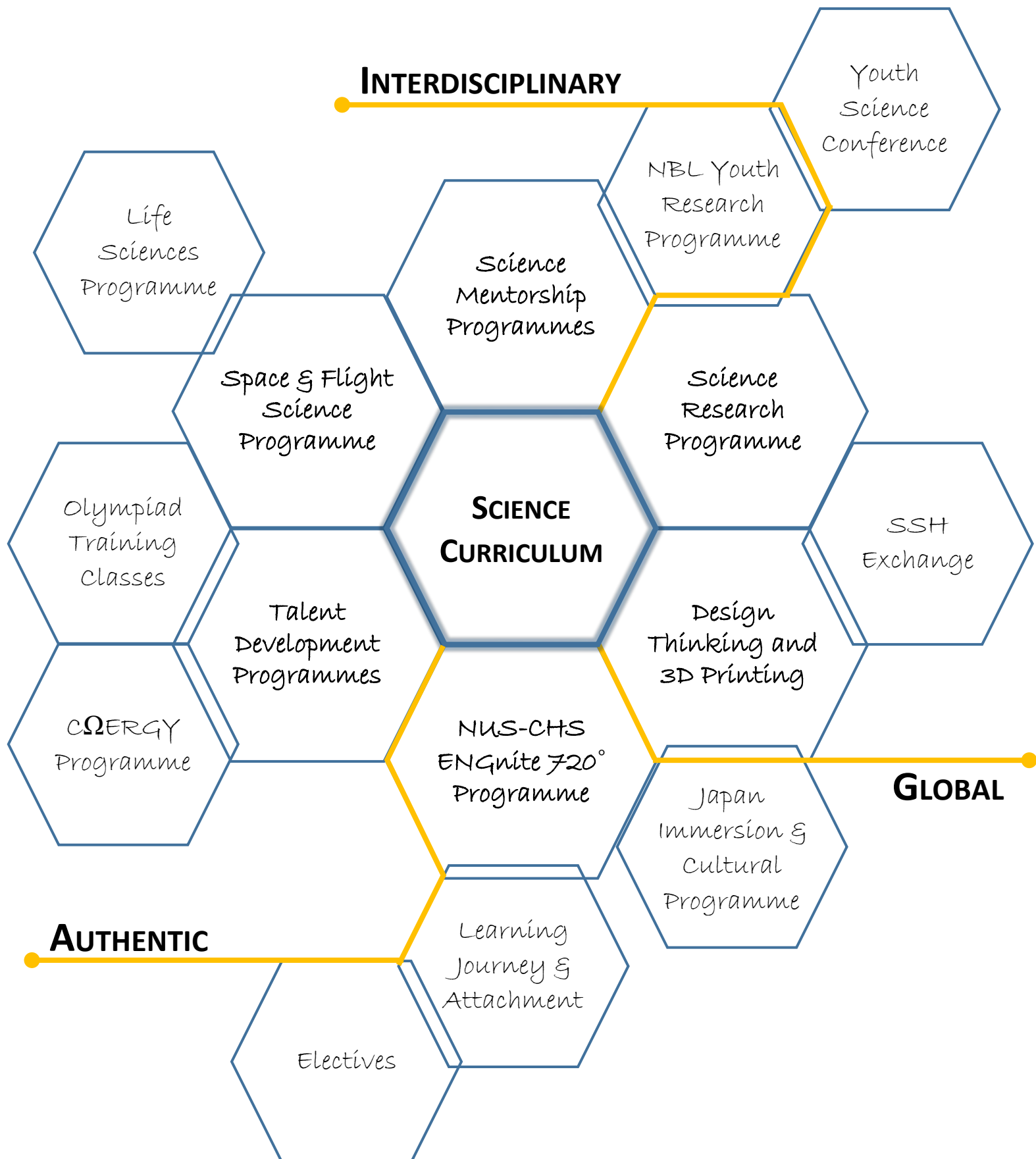


Students of the CΩERGY Programme



In-house Life Sciences Programme

# OUR APPROACH





# OUR FLAGSHIP PROGRAMME – Space and Flight Science Programme



The Space and Flight Science Programme was conceived to build upon the department's strengths and continue to provide opportunities for high performing students. This will further engage their interest and deepen their knowledge especially in physical sciences, engineering and technology, beyond striving for academic excellence. This programme complements the rigorous and authentic learning experiences already provided by our Life Sciences Programme.

The programme has three main themes – Machine, Body and Sustainability. This instructional approach allows for greater integration of various concepts in the CHS science curriculum and promotion of learning with understanding. Supported by the school's reading programme, students are exposed to topics like space food and challenges of Mars exploration. Just like how Apollo 11's historic flight to the moon in 1969 inspired the rest of mankind, the programme hopes to inspire the next generation of students who wanted to be rocket scientists and engineers.



*Learning the forces of flight through the construction of a chuck glider*



*Viewing of solar eclipse in March 2016*



*Using water rockets as a tool to learn about rockets, propulsion and aerodynamics*



*Students discovering more about space and solar system through use of visual projections in the Starlab Planetarium*



*Learning journey to the Singapore Science Centre Observatory*



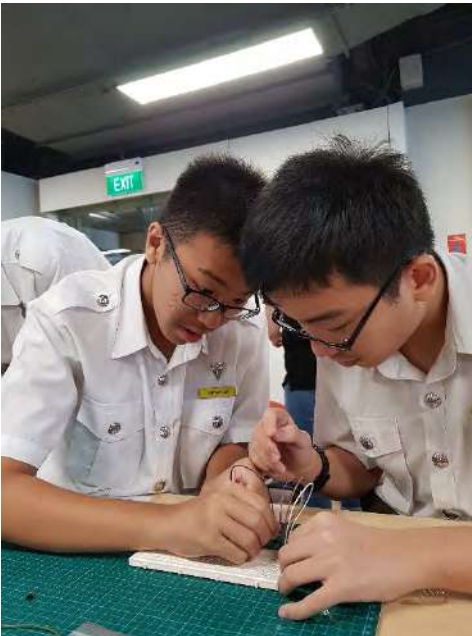


*Student with his completed LED cube made during the SpaceTech+ Module.*

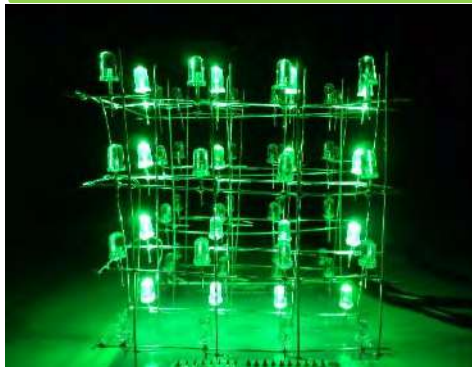


*Students being introduced to the various locally built satellites, such as the XSAT by Mr Lim Wee Seng, Executive Director of the NTU Satellite Research Centre (SaRC).*

The programme also leverage on the expertise and experience of our strategic partners to bring about greater relevance, especially from the tertiary academic institution and industry perspectives. Some of these partners include established local universities such as the National University of Singapore, the Nanyang Technological University and the Singapore University of Technology and Design. Students also get the opportunity to visit research centres such as the Satellite Research Centre (SaRC) and Centre for Remote Imaging, Sensing and Processing (CRISP). Other aviation-related partners include the Singapore Youth Flying Club and the Civil Aviation Authority of Singapore. The pinnacle of the Space and Flight Science Programme is the 3-day SUTD-CHS Flagship Drone Programme conducted at SUTD in Level 4, where students construct, program and fly their own mini-drone from scratch.



*Students at the NTU EEE for a 2-day workshop on Arduino and electronics.*





# OUR TALENT DEVELOPMENT PROGRAMME

## ▪ CΩERGY Programme



High-performing students in both the O-Level and Integrated Programme who exhibit strong aptitude and interest in science are selected at the end of Level 1 for the CΩERGY Programme. In Level 2, the students attend lessons after school and participate in enrichment programmes and activities that aim to broaden their experience and advance their learning in science and technology. In Level 3 and 4, these students go through an accelerated curriculum during curriculum time when their counterparts are going through the mainstream curriculum.

The origin of the word “CΩERGY” comes from the word “energy” which is a common theme and big idea that cuts across all science subjects. The letter “C” replaces “e” and it represents Catholic High School. The ohm symbol Ω is the SI derived unit for electrical resistance and it symbolises the scientific nature of the programme within the department. The Latin phrase *fiduciam in scientia* means confidence in science which all students in the programme is expected to possess.

Through the involvement and participation in external competitions and workshops, students are often exposed to real-world problems and products. Fieldtrips or visits provide students with first-hand experience and an opportunity to apply content knowledge with field experts. Such outside classroom platforms also allow for independent learning and access to different environments, materials and equipment. Students within the programme develop 21st century competencies as they are also involved in the planning and support of many department’s activities such as the Eluvium Science Camp, CHS P6 Outreach Programme and the hosting of overseas schools.



Diffusion Cloud Chamber Workshop



Outdoor experiential learning at MacRitchie Reservoir Boardwalk



Our Science Ambassadors during CHS Open House



CHS P6 Outreach Programme



Annual hosting of students from Toyonaka High School

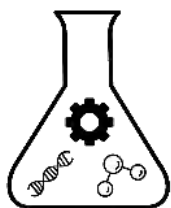


Learning journey to the National Kidney Foundation provides students with an authentic learning experience.

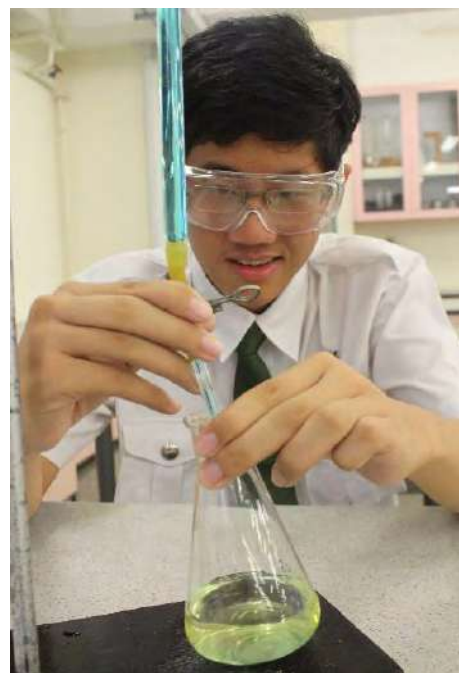


# OUR SIGNATURE PROGRAMMES

## ▪ CHS Science Research Programme (SRP)



All Year 3 students in the Integrated Programme are given the opportunity to carry out a school-based SRP in investigative scientific or engineering project under the guidance of our science teachers over a period of 20 weeks. The programme aims to engage students in authentic scientific problem solving through hands-on experimentation and independent scientific thinking. Through cooperative teamwork, it allows students to organise their ideas into an investigative research project. This may also allow them to recognise that science and engineering can contribute to meeting many of the major challenges that confront society today. Selected student groups also participate in the MOE Science Mentorship Programmes (SMP).



*"The SRP places a great emphasis on independent learning and inquisition, and I believe that the above is the greatest takeaway from this programme. Although there was a certain degree of hand-holding throughout the duration of the project, we have to effectively carry out the experiments required for collection of data by ourselves, and learn to make compromises or develop new methods to handle certain unforeseen circumstances. The programme has also given me exposure to a diversity of scientific equipment required for genetic studies such as the UV spectrophotometer. As such, I have been granted an opportunity to extend the boundaries of my knowledge not only to contextual and classroom knowledge, but also to the many different facets of Biology."*

**Mickel Ng, S3-7 (2015)**

## ▪ Eluvium Science Camp



*Students exploring the world of chemistry (left) and attempting to build the tallest and strongest tower using spaghetti and marshmallows (right).*

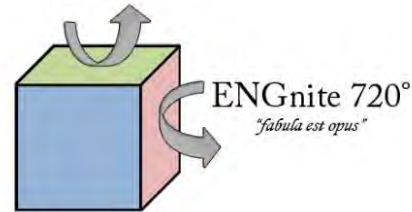
The Eluvium Science Camp is a student-initiated event organised by students from the CΩERGY Programme for their Level 1 peers. Started in 2015, this 1-day camp aspires to stimulate younger minds and their interest in science by encouraging them to develop a passion for it through discovering the fun, captivating and inspiring side of science. For example, students will get to explore aerodynamic laws and go through the engineering design process. One of the highlights of the camp is the stargazing at night, a first time experience for many of the students!

# OUR SIGNATURE PROGRAMMES

## ▪ NUS-CHS ENGNite 720° Programme



*fabula est opus*



This collaborative programme is jointly organised by the NUS Faculty of Engineering and the Science Department of Catholic High School. The programme aspires to get students to think out of the box and achieve 'fabula est opus', which means 'play is work'.

Guided by this principle, the space-themed programme aims to introduce the relevance of engineering, technology and applied sciences to Level 2 students in an authentic and engaging set up. Students will develop effective communication, questioning and critical thinking skills in engineering, technology and applied sciences by going through a series of scenario-based science or engineering-related challenges. The programme logo depicts a box with arrows pointing outwards which reflects the need to think out of the box. The name "ENGnite" is derived from the two words, "engineer" and "ignite" which are both part of the programme objectives. The number "720°" represents the multi-dimensional nature of problem-solving and critical thinking.



*Students trying to overcome a challenge during the programme*



*Group photo at the end of the intense 2-day programme*



*Creativity shown during NUS-CHS ENGNite 720° Programme 2015*



*Programme facilitators*

*"I enjoyed being able to experiment and improvise and come up with my own inventions; it was very open."*

**Lucas Loh Zheng S2-5 (2016)**

*"I liked how the programme encouraged us to be creative in the design of our prototypes. It got my group mates to brainstorm for new ideas and we had fun testing and modifying our prototypes."*

**Ngo Seng Kiat S2-3 (2015)**



*Students trying to achieve the required voltage using lemons*



# OUR SIGNATURE PROGRAMMES

## ▪ Life Sciences Programme

Our in-house Life Sciences Programme is held during curriculum time and students are exposed to a wide variety of enrichment activities conducted by our teachers. Activities are conducted progressively from Year 1 to 4 for students on the Integrated Programme on a thematic basis and include topics such as microbiology, DNA Science, molecular biology and enzyme technology. All students are engaged in the unravelling of life and a deeper understanding of the interdisciplinary nature of both Biology and Chemistry. The Life Sciences Programme was piloted in 2013 and continues to be enhanced since then.



*Students practising good aseptic techniques during lesson*



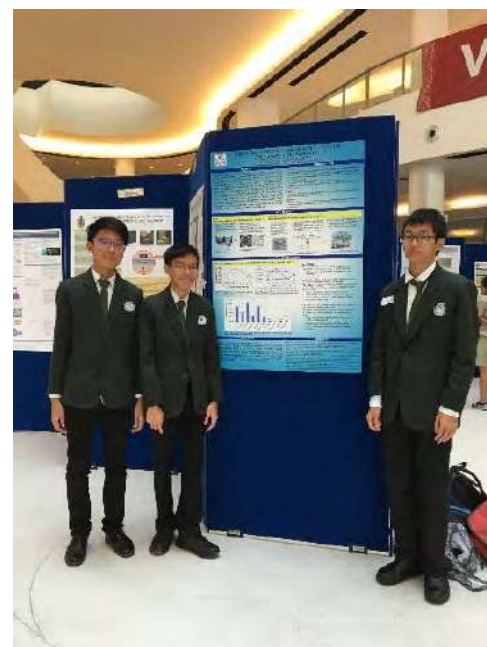
*Bacterial transformation using the Green Fluorescent Protein (GFP) from bioluminescent jellyfish*



*Inquiry-based laboratory investigation is a key feature in our curriculum*

## ▪ MOE Science Mentorship Programmes (SMP)

Since its inception in 1992, the SMP which is organised by the Gifted Education Branch, has provided young minds with an early exposure to research and laid a firm foundation for those who are interested in pursuing scientific research in tertiary institutions. All SMP participants are required to present their research findings in the form of a poster presentation during the Youth Science Conference (YSC).



*SMP participants presenting their findings using a poster format to the panel of judges*



# OUR SIGNATURE PROGRAMMES

## ▪ Japan Immersion & Cultural Programme



*Collaborative discussion with Toyonaka High School counterparts*



*Hosting of Toyonaka High School students and teachers*



*Inquiry-based lesson using a Van de Graaff generator*

Since 2016, we have been hosting students and teachers from Toyonaka High School Osaka 大阪府立豊中高等学校, a designated Super Science High School and Super Global School by the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) in Japan. This exchange programme not only serves to inspire a passion for and recognise the importance of science, technology, engineering and mathematics, it also creates opportunities for students to develop 21<sup>st</sup> century competencies, confidence and to empower them to be independent learners in an unfamiliar environment.



*"2 days was all it took to create a memory that would last an entire lifetime. I honestly never expected myself to feel attached to the people that I have met, and communication between both parties was definitely a problem many a times. However, as I vaguely remember, it did not matter, for when we were giving our souvenirs, the Japanese students' tears meant so much to us and it's a memory that will continue to reach my heart time and time again."*

**Nicholas Koh S4-9 (2016)**



*Meaningful and engaged learning in the classroom with their overseas peers from Japan.*



*Many students from both schools continue to stay in touch even after the end of the exchange programme.*



# OUR SIGNATURE PROGRAMMES

## ▪ Japan Immersion & Cultural Programme

As part of the exchange, our students visited Toyonaka High School (THS) in June. This experience allows our students to exchange scientific knowledge and ideas with their Japanese counterparts and immerse them in the Japanese culture so as to develop them to be gentlemen.



Doing work during farm stay



Face-to-face conversations at THS



Soba-making experience

*"The farm stay has to be the best activity as we fully immersed ourselves in the Japanese culture, and actually practiced it instead of just plain knowledge of Japanese customs. Interacting with the host family was also extremely enjoyable, as I learnt much about their lifestyle and a general background about them. In addition, the environment at the farm was amazing. The night sky was filled full of stars, unlike Singapore, and the atmosphere was calm and relaxing. When our host brought us out at night, it was simply awesome! Observing fireflies, listening to the croaks of the frogs, were all great fun as we gazed at the stars. The rural environment was really my favourite part of the trip."*

**Shuy Yao Kang S3-3 (2016)**



Meeting our buddies for the first time



Japan Immersion Trip 2016



Experiencing a Japanese tea ceremony



Sharing the group's findings with the class

*"I have learnt more about technology advancements and education in Japan from the factory visits, school exchange and farm stay. I find this very valuable as the whole theme of this trip is technology and engineering and this truly allows us to compare the technology in Japan with Singapore in addition to learning more about technology."*

**Tan Guan Jie Sherard S3-3 (2016)**

*"The most memorable experience from this trip would be the visit to Toyonaka High School. While I was moving around to explore the many different areas of the school, I saw students working on their house banners and actively participating in cheering practices even after their school hours. This is something I find commendable as through this, I could see that all the students have the passion for life. They put their best in non-academic activities even at the expense of their free time to ensure that their sports day is a huge success."*

**Xavier Lee Shi Wei S3-7 (2016)**



# OUR SIGNATURE PROGRAMMES



Students gain insight into scientific research and careers during the tour of various scientific facilities at Osaka University.



Educational visit to Osaka University



Industrial visit to Meiji Factory Osaka



Cultural visit to Osaka Castle

*"During the campus tour of scientific facilities in Osaka University, I visited the chemistry lab used by one of the professors. It was cool to learn about his project and I was really amazed by his persistence and hard work as he told me it took him 10 years to reach the current scientific findings and achievements."*

**Colin Hia Qingxuan S3-7 (2017)**



*"I would definitely recommend the Japan Immersion & Cultural Programme to my juniors. Rather than simply having fun, I feel that there is a lot to learn from and take away from this trip. I hope that my juniors will be able to share the same experience as me, or maybe an even greater one. It would be a pity if one were to miss this trip!"*

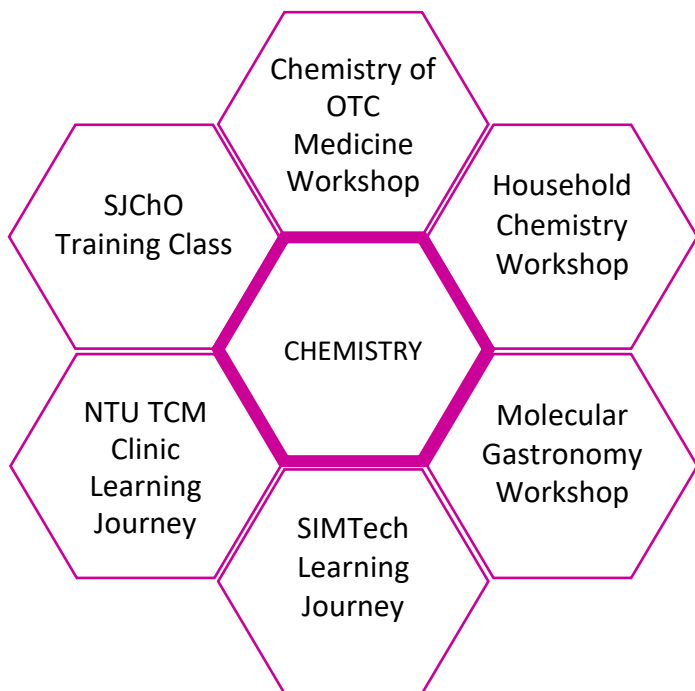
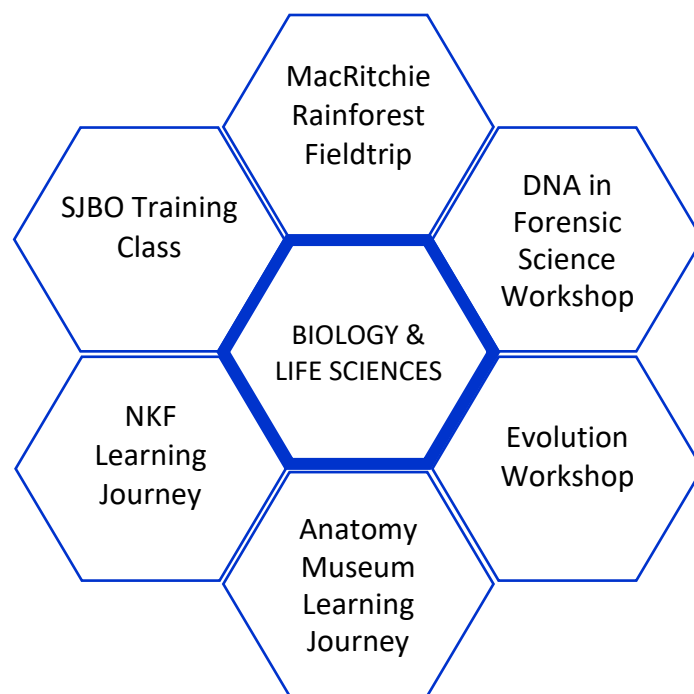
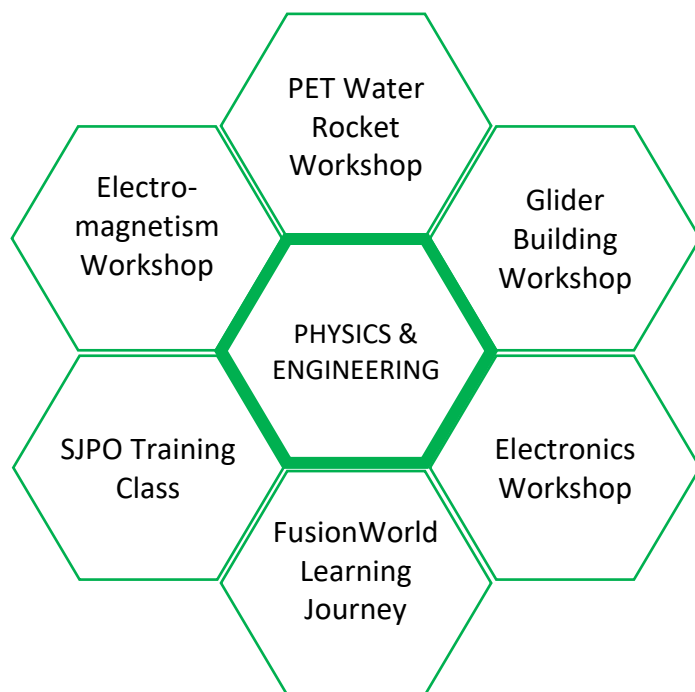
**Lucas Hong S3-7 (2017)**



Japan Immersion Trip 2017



# OUR ELECTIVE OFFERINGS



MORE ON OUR PROGRAMMES

To nurture and inspire our students to become inquirers, investigators and innovators, our science programme covers a wide range of activities that include research work, external attachments, learning journeys and advanced content modules. We constantly expose students who demonstrate interest and ability in Science to real-world problems and to allow the applications of their content knowledge in different learning environments. Some of our signature programmes include our talent development programme, CΩERGY Programme, in-house Science Research Programme and MOE Science Mentorship Programmes.



Gel electrophoresis workshop



*Experiential learning during fieldwork*

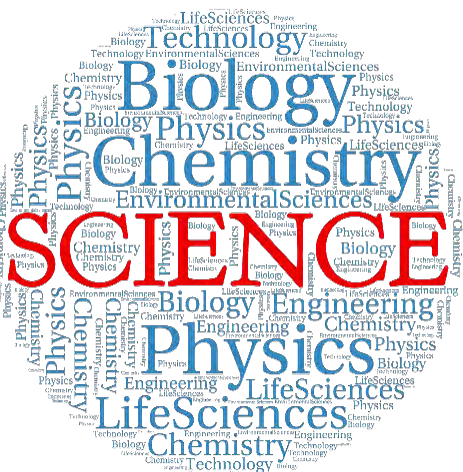
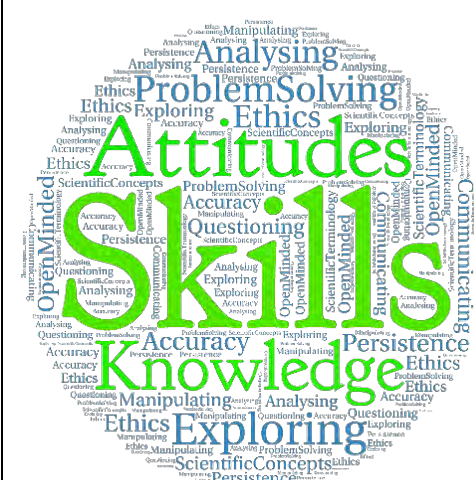


CHS Science Camp Eluvium participants

*Our students who went on an overseas Brunei trip as a result of winning the BBC Challenge 3<sup>rd</sup> Prize*



### Electrolysis during Chemistry lesson





# MORE ON OUR PROGRAMMES

Out-of-classroom elective activities provide a better quality of learning and appropriate instruction for students which cannot be fully provided for within the regular classes. Such enrichment activities include learning journeys and external workshops both which allow students to gain important 21st century competencies such as critical thinking and effective communication. Visits to industry partners and tertiary institutions also allow them to interact with various relevant stakeholders. Science competitions also provide another excellent way of extending the development of individual talents and proficiencies.

## Electives

(selected)

### ▪ PET Bottle Water Rocket Workshop

The PET (Polyethylene Terephthalate) bottle water rocket workshop is a popular activity which has been used to help our students investigate the physics of Newton's three laws of motions and understand the principles of aeronautics and aerodynamics. Students will get to design, construct and launch their own water rockets using pressure from the water.

It also provides an excellent platform for them to explore engineering concepts and manipulate and control variables to achieve optimal flight of the bottle water rockets.



*Experiencing the forces of physics!*



*Students trying to overcome the challenges of how bottle rocket design affects flight via an inquiry-based learning approach*



*Launching of PET bottle water rockets in school*



# MORE ON OUR PROGRAMMES

## ▪ Electronics Workshop



*"I learnt about how electrical components work in circuits and how they are used in real life. The highlight of this workshop was in the construction of the circuits on the breadboard as we got hands-on experience with electrical components. It picked up speed on the second day when we built more complex and interesting circuits."*

**Yip Ying Fung Leslie S4-7 (2018)**

The era of electronics began with the invention of the transistor in 1947 by John Bardeen, Walter Brattain and William Shockley. Today, after nearly 80 years, electronics has become an important part of our lives and an important role in our country's development. The Electronics Workshop seeks to provide the opportunity for students to gain experience through systematic design and modification of circuitry by applying science and engineering principles. By learning to construct basic circuits and model some circuits using elementary circuit theory, the workshop also allows the students to have a greater appreciation and understanding of the circuitry behind the electronic gadgets around them. Some of the components that participants will have the opportunity to work with include logic gates, resistors, capacitors, diodes, transistors, and operational amplifier chips.

## Learning Journeys

(selected)



### ▪ NUS Anatomy Museum

*"It was strange walking into the museum as formalin scent filled the air as we went in. A guide brought us past many (real) human exhibits, and briefed us on what they were about. Shivers raced through my spine as I peered through the glass panes separating us from the gooey bits of glands and organs in front of us. It was sobering. Yet, I wondered in amazement. The specimens were revealing on their own; they presented the textbook diagrams in three dimensional form, open for exploration. The real specimens brought up many questions which we didn't really think about when studying biology. Also, we got to observe the subtly beautiful order in which the organs relied on each other, like the way the rib bones cradled the heart. In summary, it was heartening to see the generosity of our people in their contributions towards growing our understanding of the world around us. We learnt to visualize and question more, and it was a fruitful experience."*

**Ariel Tan, S4-9 (2016)**

### ▪ Singapore Institute of Manufacturing Technology

*"The trip to SIMTech was indeed an enriching one for me as the concept of polymers and its applications is new. It was also an eye-opener for me to be able to get up close and personal in a tertiary institution to see for myself how polymeric parts can be obtained via various means, each with its own advantages and disadvantages. Apart from learning about the science behind the production of polymeric parts, I was also able to view the complexity of the machinery used in the production line. This made me realise the interdisciplinary nature between science and engineering. Overall, I find the trip to be highly educational and I was able to experience how science can be applied to the real world."*

**Shuy Yao Kang, S3-3 (2016)**



### ▪ Institute of High Performance Computing

*"During our visit to IHPC, we had the rare opportunity to view the computer visualisation and simulation of Singapore's transportation network. Such simulations of train breakdowns allow us to see how computational modelling can factor in various infrastructure and socio-economic constituents to analyse a problem. Not only does the trip allows us to appreciate the innovative work of the scientists, it also enlightened us on the potential applications of such cutting-edge technology. Overall, the trip has helped me to realise that IHPC is an exceptionally indispensable resource in Singapore's growing R&D field and has amazing potential, via the advancement of science and technology, to transform the industry in Singapore and beyond."*

**Leong Yu Hui, Melvin, S3-4 (2016)**





# OUR ACHIEVEMENTS

In keeping up with our tradition of strong academic achievements, we continue to achieve excellence in many areas like competitions and proficiency tests. The school emerged as Runner-up in the National Science Challenge 2018. In the recent International C. B. Paul Science Quiz 2019, our school garnered a total of 5 Gold Medals, 5 Silver Medals and 4 Bronze Medals. We have also produced many A\*STAR and YDSP scholars over the years.

Other key achievements in recent years include the followings:

- C. B. Paul Science Quiz: 69 Gold (till date)
- Drone Odyssey Challenge: 1<sup>st</sup>, 2<sup>nd</sup> (2019)
- Elementz Science Conference: Gold (2019, 2018)
- International Biomedical Quiz: 5 Gold (till date)
- National Air Race: 3<sup>rd</sup> (2019), 2<sup>nd</sup> (2018)
- National Science Challenge: Semi-Final (2019), 2nd (2018), Semi-Final (2017), Quarter-Final (2016)
- NUS Chemistry Communication Challenge: Merit (2019), Top 4 (2017), Champion (2015)
- Sembcorp Marine Green Wave: Runner-up (2018)
- Singapore Junior Biology Olympiad: 8G, 39S, 35B (till date)
- Singapore Junior Chemistry Olympiad: 13G, 22S, 61B (till date)
- Singapore Junior Physics Olympiad: 23S, 60B (till date)



*International C.B. Paul Quiz 2016*



*Chemistry Communication Challenge*



*National Science Challenge 2018*



*East Zone A\*STAR Science Fair 2015*



*YDSP Scholarship Awardee*



*NUS Amazing Lab Race*



*National Air Race 2019*





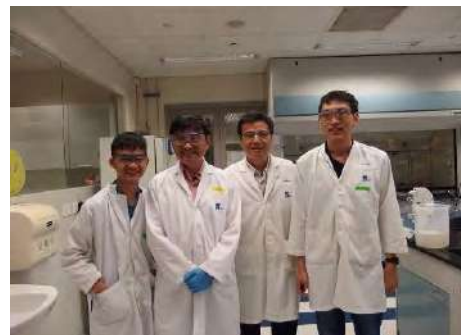
# OUR PARTNERS

Through our strategic alliances with leading organisations, both local and international, the department has ensured that our science curriculum has been kept relevant with scientific and technological developments around the world.



Institute of  
Bioengineering and  
Nanotechnology

Our partnership with the **Institute of Bioengineering and Nanotechnology (IBN) A\*STAR**, the world's first bioengineering and nanotechnology research institute, complements our rigorous academic curriculum and adds on to an already wide range of opportunities for our students beyond the classroom. A memorandum of understanding between Catholic High School and IBN signed in April 2016, will help further build the capacity of our students. With IBN's track record in research and innovation excellence and our school's tradition of excellence in producing well-rounded students, this collaboration offers exciting opportunities for both organisations.



*Students on the Youth Research Program attachment at the Institute of Bioengineering and Nanotechnology (IBN) A\*STAR during the school holidays*



*Scan the code for more information about YRP.*



*IBN research attachment*



*MOU signing ceremony*



*IBN Open House*



*Lab visit at SIMTech*



Singapore Institute  
of Manufacturing  
Technology

Our students visit the **Singapore Institute of Manufacturing Technology (SIMTech) A\*STAR** annually to discover more on material science and technology. Not only do they gain insights on areas like thermoplastics, 3D printing and injection molding, they also get the opportunity to interact with industry stakeholders from the three centres of Precision Engineering Centre of Innovation (PE-COI), Sustainable Manufacturing Centre (SMC), and Manufacturing Productivity Technology Centre (MPTC) located within SIMTech.

# OUR PARTNERS



The **Singapore Youth Flying Club (SYFC)** and Catholic High School recognise the opportunity for collaboration to promote science and technology for the purposes of creating awareness, developing interest and inculcating a strong passion amongst students in aviation and flight science.



*Forging a partnership for greater synergy*



*Launching a balsa wood glider*



*Diamond DA40 aircraft*

On 23 August 2017, Catholic High School and the SYFC signed a Letter of Intent to establish a partnership. Under this strategic and educational partnership, students can be expected to be exposed to a wide variety of authentic aviation-related activities usually not made available to others, such as joyrides on board SYFC aircrafts. In addition to learning journeys to SYFC located at Seletar, other activities include invitation to the Basic Flying Course. SYFC sponsors and awards the prestigious SYFC Physics Prize to students who exhibit excellence in Physics.



*Diamond DA40 aircraft simulator*



*The Aviation Milestones Gallery*



*CHS welcomed as one of CAAS ASI partners*



On 15 August 2019, Catholic High School came on board as one of CAAS Aviation in Schools Initiative (ASI) partners during the CAAS Aviation Open House, in recognition of the school's efforts to cultivate interest in aviation amongst the students. ASI offers funding and advisory support for any activities that foster students' interest in aviation and its careers, and increase their exposure to an aviation environment.





# OUR PARTNERS

The annual **NUS-CHS ENGNite 720° Programme** is jointly-organised by the department and the **NUS Faculty of Engineering**. The partnership started in 2015 with the aim of aspiring students to think out of the box and achieve '*fabula est opus*', which means 'play is work'. Guided by this principle, the 2-day programme introduces the relevance of engineering, technology and applied sciences to students in an authentic and engaging set up.



School of Electrical and Electronic Engineering

The 2-day **NTU-CHS SpaceTech+ Module** held at the **NTU School of Electrical and Electronic Engineering**, allows students to gain an insight into the different sub-disciplines of electrical and electronic engineering. In addition to learning fundamental electronic circuits and Arduino coding, students also get to tour the Satellite Research Centre (SaRC), an innovative centre that provides an exciting research environment for aspiring satellite and space enthusiasts. On the final day, students get to put on their thinking cap to design and build their own weather station!





# OUR PARTNERS



**Toyonaka High School Osaka** 大阪府立豊中高等学校, an officially designated Super Science High School and Super Global High School by the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) in Osaka, Japan started an exchange programme with Catholic High School in 2016. In addition, students will also visit various scientific facilities located in Osaka University 大阪大学 or University of Tsukuba 筑波大学, during campus tours specially customised for our school during our trip in Japan.



大阪大学  
OSAKA UNIVERSITY





# OUR PARTNERS

An initiative by **Defence Science and Technology Agency (DSTA)** and **DSO National Laboratories (DSO)**, the **Young Defence Scientists Programme (YDSP)** provides you the opportunity to shape your interest in defence science and technology through a diverse range of exciting activities:

- **YDSP Science & Technology Camp**
  - A bi-annual five-day camp with hands-on workshops, project visits and competitions to introduce science and technology to students.
- **World of Science**
  - Informative series of lectures and lab sessions exposing students to advanced science topics.
- **Research@YDSP**
  - 4-month attachment programme, which offers students the opportunity to learn techniques and lab work under the mentorship of staff and professionals in DSTA, DSO and research institutes.



2016 YDSP S&T Camp



Who says learning stops when you get off school?



*Scan the code for more information about YDSP.*



YDSP S&T Camp participants



YDSP Congress



YDSP S&T Camp Year 2 Champion Team

*An Initiative By*



# CATHOLIC HIGH SCHOOL SCIENCE CURRICULUM: Inquirers, Investigators and Innovators

**Enhance • Excite • Engage • Empower**

Attachment	External Research Programme	Catholic High School Programme	Learning Journey /Workshop	External Award
<ul style="list-style-type: none"> <li>• Singapore Science Centre Work / Research Attachment</li> <li>• DSTA Internship Attachment</li> <li>• YDSP Camp</li> <li>• CRADLΣ S.M.A.R.T Camp</li> </ul>	<ul style="list-style-type: none"> <li>• Youth Research Programme (YRP) by NBL</li> <li>• REP (Research Exposure Program) by A*STAR</li> <li>• Science Mentorship Programme (SMP) by GE MOE</li> <li>• Nanyang Research Programme (NRP) by GE MOE</li> <li>• Young Defence Scientists Programme (YDSP) by DSO</li> </ul>	<ul style="list-style-type: none"> <li>• Space and Flight Science Programme</li> <li>• Japan Overseas Immersion and Cultural Programme</li> <li>• Life Sciences Programme</li> <li>• CΩERGY Programme</li> <li>• Science Research Programme</li> <li>• Biology, Chemistry and Physics Olympiads Training Programmes</li> <li>• Design Thinking &amp; 3D Printing Programme</li> <li>• Eluvium Science Camp</li> <li>• Science &amp; Mathematics Week</li> <li>• Inter-class Science Quiz</li> </ul>	<p>Local</p> <ul style="list-style-type: none"> <li>• A*STAR</li> <li>• SIMTech</li> <li>• Lee Kong Chian Natural History Museum</li> <li>• FusionWorld</li> <li>• NUS Anatomy Museum</li> <li>• PET Rocket Workshop</li> <li>• Glider Building Workshop</li> <li>• Electronics Workshop</li> <li>• Chemistry of Cosmetics</li> <li>• Drone Swarming Workshop</li> </ul> <p>Overseas (Japan)</p> <ul style="list-style-type: none"> <li>• JAXA Tsukuba Space Center</li> <li>• Osaka University</li> <li>• Toyonaka High School</li> </ul>	<ul style="list-style-type: none"> <li>• The Lee Kuan Yew Award For Mathematics And Science</li> <li>• A*STAR Science Award</li> <li>• YDSP Scholarship</li> </ul>

## **Tertiary Institution Programme**

NUS-CHS ENGNite 720° Programme

NTU-CHS SpaceTech+ Module

SUTD-CHS Flagship Drone Programme



# OUR VOICES

"I am grateful towards the passionate and knowledgeable teachers I had in Catholic High School. They have not only given me a solid foundation in the sciences but have sparked my curiosity in natural phenomena beyond the classroom. This foundation has served me well throughout the years, and this curiosity has led me to pursue a science degree."

**Damian Boh (Class of 2006)**  
**Physics with Theoretical Physics**  
**Imperial College London**  
**A\*STAR National Science Scholarship**

"Science as a subject so far in Secondary 1 and 2 has been a whole new take for me. In these two years, I have been exposed to much more than just textbook knowledge. All the projects and performance tasks are many instances and chances for me to work outside of the classrooms. All these have really helped me to improve the application of science in my everyday life and for future purposes."

**Koh Wei Xiang, Nicholas (Class of 2014)**

"Through my years of science education, I have been given the opportunity to explore and discuss scientific concepts with my classmates through discussions and projects. Learning science as a subject has enabled me to develop deeper relationships with my friends as the subject leaves a lot of room for discussion. Through the projects that I have done, I have gained experience in scientific investigations and project management. Overall, my science education for the past two years has been fulfilling and enriching."

**Lhui Kay Kin, Clyde (Class of 2014)**

"It was during my time in Catholic High when the foundation was laid for my future in engineering. I was taught the importance of staying passionately curious and to constantly strive for excellence - qualities that are crucial in the aerospace field. In tough times, I still look back to the priceless experience and wisdom imparted by my teachers all those years ago."

**Nicholas Quake (Class of 2007)**  
**Aerospace Engineering**  
**Embry-Riddle Aeronautical University**

"My education in Catholic High School was instrumental in sparking my interest in the sciences, with opportunities aplenty for the budding clinician-scientist in me to explore and make the most of. In addition, my teachers had not only spurred us to achieve academic excellence, but had also reminded us to give back to society in whatever way possible with the knowledge we have acquired."

**Tay Shi Huan (Class of 2007)**  
**Natural Sciences (Biological)**  
**University of Cambridge**  
**A\*STAR National Science Scholarship**

"YRP provides a good exposure to life as a researcher in IBN. Surrounded by passionate officers who are always keen to render assistance or guidance, I feel that I am well taken care of in the laboratory. I had expected the office setting to be very stern and stiff, but my experience in YRP has proven otherwise. I have also picked up some pretty difficult concepts (at least for my current standards). I get to experience the thrill of applying what I've learnt in theory into practice, to find solutions and to discover. I can actually apply what I've learnt in theory to find solutions to real-world issues that have yet been resolved. While the research process may be repetitive and sometimes daunting when I face repeated unsatisfactory results, the interest for scientific discovery and the companionship of like-minded colleagues can really spur me on in such a career. I am very thankful to have been given this golden opportunity to experience what it is like to be a full-time researcher in a research facility."

**Jacky Kung Wei En (Class of 2015)**

"My time at Catholic High was life-changing. I was given incredible opportunities to explore my interests in the sciences. Over the 4 years, I participated in more than 10 science competitions, such as the National Science Challenge. Everyone was a great learning experience. I am super thankful to the devoted and knowledgeable teachers at Catholic High."

**Xu Ruolin (Class of 2008)**  
**Mechanical Engineering**  
**Massachusetts Institute of Technology**  
**Singapore Technologies Engineering Overseas Scholarship**

# OUR VOICES

*"CQERGY Programme has opened my eyes to science in more ways I can imagine, from the courses and competitions such as ENgnite 720° or the cosmetic-making workshop that I have participated. I have thoroughly enjoyed them. It made me more interested in science and it provided a lot of opportunities for me to discover my passion. I really like how CQERGY has changed from being a science talent development programme to something much more. It has been a big impact to my school life thus far."*

**Cedric Tan Renjie (Class of 2016)**

*"I came to Catholic High School with a vague fascination of science, and left with a determination to pursue it as a career and lifelong hobby. The teachers are genuinely interested in the subjects, and they inspire students to appreciate the subjects at a greater depth. It is difficult to find teachers who will put in their best efforts to maximise the potential in every student."*

**Melvin Yin (Class of 2008)**

**Physics**

**University of Cambridge**

**A\*STAR National Science Scholarship**

*"Some of my fondest memories of learning science were in Catholic High School. I vividly recall the sense of wonder and joy at being able to understand the world around me. Thanks to the patient instruction of my teachers, science wasn't merely about rote memorisation of the periodic table but it became a living subject. To this day, I still cherish the fascinating first steps into science that I took while in Catholic High."*

**Joshua Goh (Class of 2007)**

**Chemistry**

**Imperial College London**

**President's Scholarship,**

**SAF Scholarship**

*"The science teachers in CHS were passionate individuals in their own way. Some inspired through confidence with their years of teaching in their field of expertise, others went the extra mile to customise lessons that made it easy to understand concepts and processes. Regardless of their styles, they had inspired me to pursue a degree in science and engineering and I have not looked back since."*

**Jaren Soo (Class of 2006)**

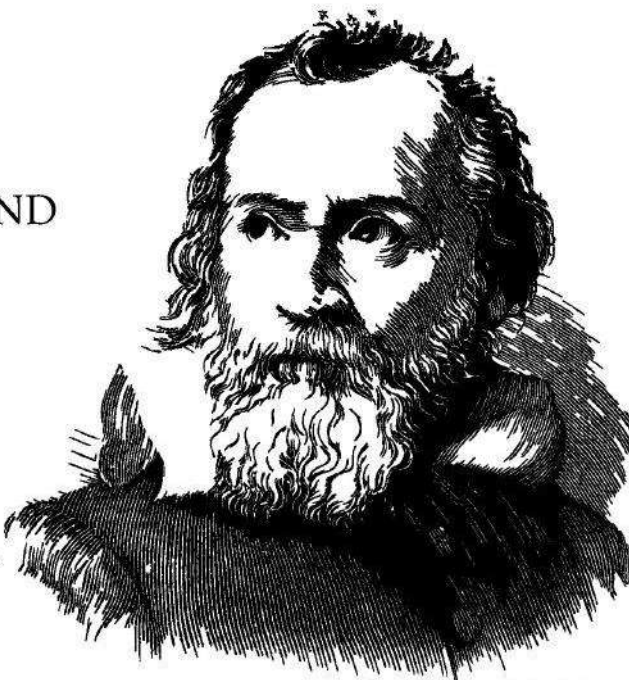
**Civil and Environmental Engineering**

**Massachusetts Institute of Technology**

**Environment and Water (NEW) Scholar**

## DISCOVER THE TRUTHS OF SCIENCE WITH US!

ALL TRUTHS ARE  
EASY TO UNDERSTAND  
ONCE THEY ARE  
DISCOVERED;  
THE POINT IS TO  
★ DISCOVER ★  
THEM.



**Galileo Galilei**





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