



**SINGAPORE
INTERNATIONAL
SCHOOL**

STEM



Science • Technology • Engineering • Math

NEWSLETTER

April 2021

Dear Parents

We are excited to launch our second STEM newsletter. Our students continue to explore hands-on STEM-based learning activities and are able to apply them to real-world scenarios.

Other skills attained through STEM education other than problem solving, critical thinking, creativity, curiosity, decision making, leadership, and entrepreneurship are: acceptance of failure and perseverance.

Regardless of the future career path considered by our children, we provide our students with opportunities to build valuable skill sets that will support them to be successful and innovative.

Our students enjoy every STEM lesson, which provides multi-disciplinary learning opportunities.

Lorraine Els

Principal SIS@Gamuda Gardens



NEWSLETTER

YEAR 1 INTERNATIONAL



In STEM this month we linked it to the theme that we have been discussing in Social Studies which is Natural Disasters - what causes them, what happens during it and how to stay safe.

The 1L students became engineers during our STEM lessons and built a house that could survive a hurricane. Students had to work hard at being part of a team, creating something that would not be too heavy, using the right amount of clay to keep the structure strong and firm and creating a base that was raised to protect the house in case there was a flood.

Students did so well and each group came up with a different design! ALL houses survived the hurricane and floods!



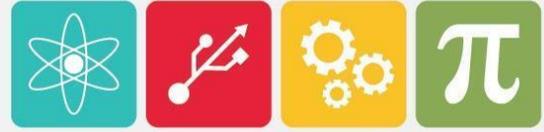


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YEAR 1A & 1B INTEGRATED

In STEM we discussed the impacts of oil spills on the environment and how we can find solutions to the problem. This hands-on experiment provided students with an understanding of the issues that surround environmental cleanup. Students were divided into groups and created their own oil spills. They then had to try different methods for cleaning them up and discuss the merits of each method in terms of effectiveness. After this activity students were able to: Identify some causes and effects of oil spills and describe different methods that could be used to solve this problem.





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YEAR 2 INTERNATIONAL



This term the Year 2's learnt about "Sniffly Sneezes". This focused on the process of **absorption**. We used various materials to test how much water each material could absorb. We also felt each material and tested its strength. We ranked each material according to how it felt, it's strength and absorbency before choosing the best material. We used food colouring to make it easier to see. This way it was also more fun!





NEWSLETTER

YEAR 2A & 2B INTEGRATED



Year 2 Integrated students have been learning about colours in our English lessons so we linked this topic to our STEM lessons and did a lot of colour mixing!

The students had a lot of fun experiencing the changes that occur in colours when we add different materials like milk and soap. They had the opportunity to do the experiments themselves and find out how the colours reacted to each other.

They've also learned how to make new colours by mixing primary colours. Year 2's had some colourful lessons this term!





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YEAR 3 INTERNATIONAL

In 3L we have been having a lot of fun engaging in S.T.E.M. activities in Term 3. We started off with *Racing Rockets* in January; pupils designed paper rockets to race against one another using air power. In February we learned about how different materials can be *reused* or *recycled* for a variety of purposes, then the pupils designed and created their own weird & wonderful objects using only recycled materials.

In March we had a lot of fun working on *Fossil Folly* – pupils learned about different body parts of dinosaurs and what their functions were. Then they designed and created their own dinosaurs with modelling clay – we had some pretty unique dinosaur creations & concepts!

The whole-school has been getting involved in *Project-Based Learning* in recent weeks and most of the children in 3L are working in groups to design and make their very own *Green Buildings* (with the exception of two students who are working on a project about the *colonization of Mars*). All of the pupils in 3L are really enjoying the hands-on activities and creating their visual aids for these projects.





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YEAR 3A & 3B INTEGRATED

Grade 3 Integrated have been learning about building bridges in STEM.

In small groups the students tested out ways to make bridges out of paper. By folding paper in a concertina shape they discovered they could instantly make paper much stronger. Students quickly realized that this was because of the triangle design, seen in many bridge designs such as the truss bridge. They had fun testing out how much weight their paper bridge could hold.

Students then began drawing designs for their own bridge. They spent several lessons working collaboratively to build their bridges. They learnt through trial and error, ways to strengthen their bridges. They discovered which materials worked well and which didn't and how to adapt and change their planning to overcome these problems.





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YEAR 4 INTERNATIONAL

This term the Year 4L's have been working on a number of activities during STEM classes - from coca cola and mentos experiments to creating our own dinosaur fossils.

The latest project we have completed included all our school subjects as we got to research, design, create and present a 3D model of a landscape we created ourselves. We learnt about the difference between landscapes and water bodies and how they affect what grows or lives near or in them.





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YEAR 4A & 4B INTEGRATED

It all started with a documentary, during social studies class, which subsequently piqued the interest of these pupils on the topic of volcanoes. The pupils researched the history of the world's greatest volcanic eruption, Krakatoa, in 1883.

Also, the pupils delved a little into earth science, researching the causes of volcanic eruptions. Taking things a little further, they built their own models (using recycled paper) to simulate an eruption with some of their bucket chemistry knowledge.



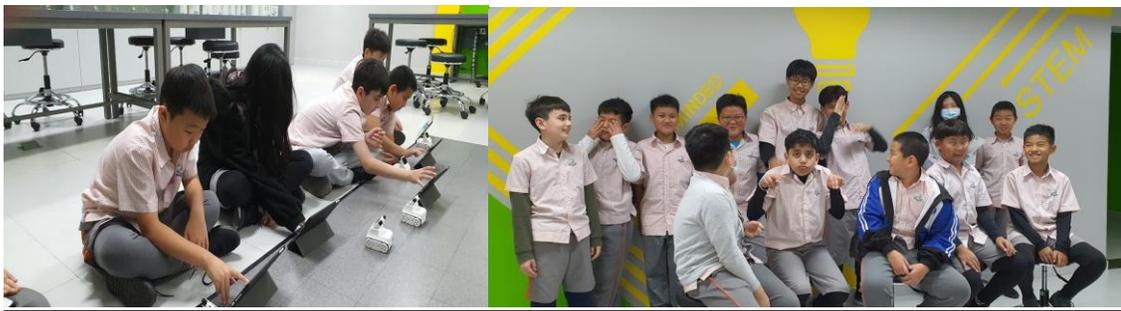


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YEAR 5 INTERNATIONAL

The students of 5L love the Robotics Program at SIS! With the capabilities and resources of the STEM Room, 5L was first introduced to programming and advanced robotics with the *Cody Rocky* Series. These robots are capable of carrying out a wide range of functions in order to achieve a multitude of tasks. The students have each been learning the complexities of the programming system on their iPads and writing specific code. Through *Bluetooth* connectivity, robots then can respond to the student's code. If the robot does not achieve the desired result, the students must assess their original design and try again.

5L is thrilled each week to see what's next for STEM and their robot journey!





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YEAR 5A INTEGRATED

5A students have been working on a variety of STEM activities since Jan. 2021. Topics have included Chemical reactions, Robots and Spacecraft Design. Students in STEM classes are exposed to Science, Technology, Engineering and Math. All three are the careers of the future. Here at SIS we want to start preparing students not only for IGCSE's and A-levels but beyond in the world of work. Students learn a variety of skills around design of projects and planning step by step how to complete projects. 5A as a class has been divided up into small groups to accomplish many projects and to learn from each other. We will continue to develop STEM activities here at SIS.





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YEAR 6 INTERNATIONAL

The year 6 international students started STEM class this term by exploring the process of sublimation and electrical energy. The pictures show the students creating a simple circuit and observing the sublimation of dry ice. Theories learned in the classroom make sense through these simple activities!





NEWSLETTER

YEAR 6A INTEGRATED



Since the students are learning the basic principles of simple machines in Vietnamese Physics class, the students will be doing a project about simple machines by creating their own flashlight and exploring more on the UBtech kits in the STEM room. This way, concepts learned in Science and Math will make sense to the students. The picture above shows the enthusiasm of the 6A students while building their first mechanical cat.



NEWSLETTER

YEAR 6B INTEGRATED

The first half of term 3 - the students built their own roller coasters using cardboard and scratch papers. They learned how the energy conversion provides thrills in rides that depend on height.



During the second half of Term 3, we started using the UBTech advanced kit. The students are expected to build their own robots and to execute commands (either pre-program or their own code). Minh Tri and Bach excel in this project!





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YEAR 6C INTEGRATED

“STEM is an approach to **learning** and development that integrates the areas of science, technology, engineering and mathematics.” ~ <https://www.education.wa.edu.au/>

Engineering, Mathematics and Science: For the month of January, the students learned about how roller coasters work and the principles behind it. They built their own roller coasters using cardboards and scratch papers. It was just unfortunate that we weren't able to finish it due to the recent COVID lockdown in Hanoi. Nevertheless, we finished the project by watching different roller coaster rides videos and writing a reflection about it.

Engineering and Technology: As soon as the school resumed, the students were introduced to a new project using the UBTech advanced kit. By the end of term 3, the students are expected to have

- Built a 1, 2 or 3 star rating robot following the advanced model manual
- Edit the code/program and have it executed through the built robot
- Written a short reflection about their projects, its advantages and disadvantages and how the project can be improved.





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YEAR 7LA and 7LB INTERNATIONAL

Heat Loss Project



In this project-based learning activity, 7th grade science students use digital technologies to measure heat loss in the home by building a model house using recycled materials. The objectives of the STEM project are:

- examine thermal images to identify areas of greatest heat loss in residential homes.
- Compare temperature data to thermal images looking for patterns of heat loss.
- Improve energy efficiency by insulating the model home to prevent heat loss.



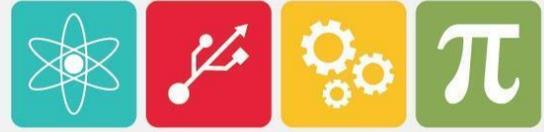


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YEAR 7A AND 7B INTEGRATED



The students used an UBTech kit to create simple robots. The first activity is to build a “lucky Cat” that they can program to wave up and down using simple block commands. The students will be learning: the relationship between distance, speed and time (Science), the angles (Math), recognize and use touch switches (Technology), master 3 execution modes of touch switches (Engineering), design and operation in groups to improve communication and teamwork (Art).



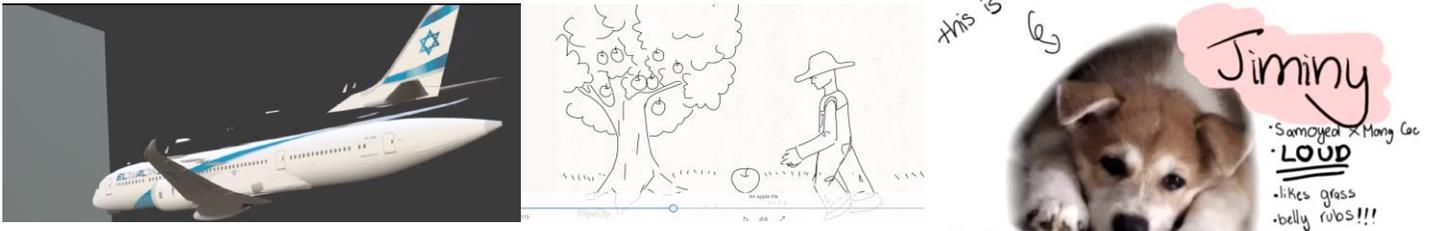
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YEAR 8LA INTERNATIONAL

December, 2020 - January, 2021: The students made their original animations with the following criteria.

- Original music should be used or use music that is free of copyrights.
- Original illustration: drawing with stationaries, creating their own images using adobe and other apps, animating their animation using a free animator and with a minimum duration of one minute.

Here are some clips taken from the animations they made.



During the recent online learning, the students were introduced to scratch programs and UBTech kits. As soon as the school resumed, they started building their chosen robots using the UBTech advanced kit. Here are some photos taken of how excited they are while using the STEM room.





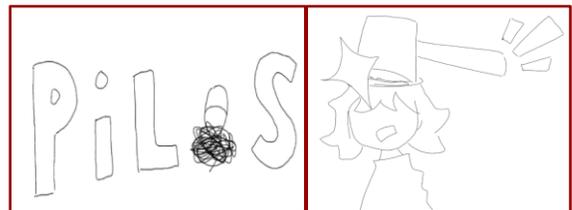
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YEAR 8LB INTERNATIONAL

The students were given a CREST award project which is creating an original animation. They were given ten weeks to complete a 1-minute animation without infringing copyrights. Here are some clips taken from their best animations.



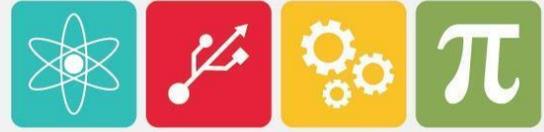
Created and animated by: Pham Hoang Khue group



Created and animated by: Khanh Minh & Bao Anh

After their amazing animation presentation, the students were introduced to UBTech kits. They are tasked to build their chosen robots and make several movements using a scratch program. They will then write a reflection about the challenges they have had in their 5-week robotic projects.





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YEAR 8LC INTERNATIONAL

They were given a 10-week long CrestAward project which is making their original animation without infringing any copyrights. The animation has to be a minimum of 1-minute duration. Most of the outputs are amazing. These are clips and links for the best original animations of year 8LC International.

(Video) [Pixelated animation](#) "The Paper Diet" - [Bilegdorj Munkhbayar, Nguyễn Tài An, Park YongJun and Vincent Le Delater](#)

<https://www.youtube.com/watch?v=bjidoKT0mec>

(Clips below) Paper animation "The Life of a Potato"
- Dương Triều An, Phan Nguyễn Diệu Anh, Mishaani



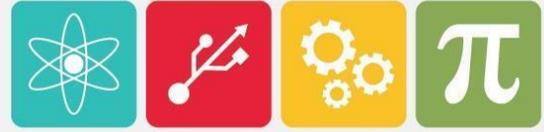
(Clips below) Paper animation "Makeup Tutorial"
- Chun SooBeen, Lee SuHyun, Tonwisee





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After the TET holiday, the students were introduced to UBTech kits. They were excited to use the STEM room and build their chosen robots. In a duration of 5 weeks, they should have built at least one robot and be able to control it using the scratch program. Their robotics project will end on 31st of March, and they are expected to write a reflection about the challenges they experienced while completing their tasks.





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YEAR 8A INTEGRATED

Project-based Learning is not just the finished artifacts but the presentation of the artifacts which includes public speaking. Year 8A Integrated had this chance to present their Project-based Learning output projects on STEM during the end of term 3.



Students played an active role in their learning in which they make sense of their ideas, problems and information they encountered. They also learned different concepts in the classroom and were able to apply these knowledge into real life, applying skills that enable them to use education to empower themselves. Creating solutions to water and air pollution, food waste and traffic in Hanoi are some of their topics that really address the realities of life that they realize how important they are to solve on their own.



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YEAR 8B INTEGRATED



8B Integrated students are working on their Project-Based Learning (PBL) during their term 3. The students have been able to finalize research and visual aids of their project-based learning which is part of their STEM curriculum. They grouped themselves, plan, research and do models, posters, PPT or any forms of presentation and had been able to present these project outcomes. Some of the topics are Colonization on Planet Mars, Gender Inequality, Solutions To The Problems Of Traffic In Hanoi, Food Waste and History Of AK-47.



Several steps have been considered to complete their findings on their project like: 1- The truth about colonizing planet Mars, 2-Possible measures on how to colonize Mars, 3-Reasons on why they colonize it, 4- Stating those obstacles and possibilities of living on Mars. If you were given the opportunity to travel to the planet Mars, would you be able to seize the opportunity?



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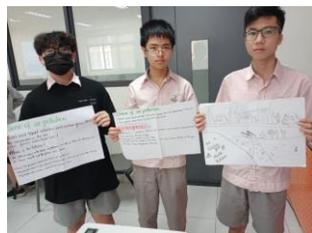


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YEAR 9A INTEGRATED

Sustainable Green Building is one of the topics that has been chosen by a group of 9A Integrated students for their Project-based Learning in STEM during term 3. Their project topic was about the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle. The benefits were enumerated as environment - using less water, energy or natural resources; economic - cost savings on utility bills for tenants or households, lower construction costs and higher property value; bring positive on social impact. Many of these benefits are around the health and wellbeing of people who want green offices or live in green homes.



Project-based Learning is about creating a project which ordinarily takes a form of artifacts which are presented in a real life audience. Students had been able to present their projects during the last week of term 3.





NEWSLETTER

IGCSE 1A

It is becoming a growing classroom practice in many school subjects, including mathematics and science, to use games to promote the understanding of concepts and skills. STEM project for IGCSE 1A, 1B and 1C this term 3 was more about making students' own game board and chips, learning the board game rules and playing the game in pairs.



The easy format helps any player to adapt quickly to the game and with a fun, slightly competitive atmosphere; the learning aspect of the game may even go entirely unseen. Science-Math board games can help students learn how to complete their math and science skills more quickly. This teaches students to think fast, trying to encourage them to learn how to complete the skills within a short time limit.

IGCSE 1A students, through playing they gained experience, with experience they gained knowledge and become better players, good enough perhaps to become tomorrow's champion.



"This game is good because it can develop the logical and quick thinking abilities of the player. My decision making will develop into an accurate and on stake decision that I may know I had decided it by myself and accept any consequences of it" the student explained her experience.



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IGCSE 1B

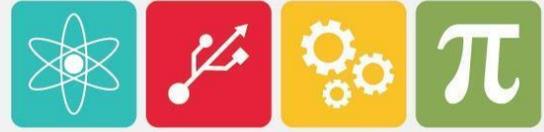


Students worked on a project over a period of time that engaged them in solving real-world problems or answering a complex question. During the gallery wall in school at the end of term 3, IGCSE 1B students had presented topics for their project in STEM. One of their presentations was about How Human Simulate. It is all about the application of techniques from computational simulation and data science to achieve two complementary goals. The theoretical goal is to enhance research in the humanities and human-science domains with reference to the nexus of human minds, human cultures, and physical environments. The practical goal is to solve urgent social and public-health problems using data-driven decision-support tools and artificial environments for policy exploration.

IGCSE IB students had also these chances to play and discovered the use of strategic moves and techniques using the Integers chips through another project which is board game. They executed tactics to remove the challenger's chips through mathematical operations. Its significance to dramatize the importance of Science and Mathematics using this typical game.

"This game is so fun. I love playing. It helps my math and science skills improve," said one of the students.





NEWSLETTER

IGCSE 1C



IGCSE 1C students' STEM class have been working with Project-based Learning this term 3. They had been grouped together to do their own artifacts projects and had been able to present these projects during the gallery walk at the end of term 3. Their topics were Green Building, How to Prevent Air Pollution as an Individual which eventually discussed more on environmental conservation. Among their solutions to these pollution were to avoid using gas powered lawn and garden equipment; the use of fans instead of air conditioner; Say no to plastic materials; Don't let our future go up in smoke; and Plant trees.



There are also some talented students who can do easy coding or are capable of doing complexities of programming at UBTech Advanced. They are our SIS school's future hall of fame in the field of science. Keep it up!

Students had also made a board game project which, characterized by a mental competition between two opposing players where the one with an alert mind and strength to achieve something, wins this battle of minds. Students started the project by creating their own boards and chips then eventually played thereafter. It encourages quick thinking in an easy to learn, fun setting, and many students have greatly benefited from playing with it.

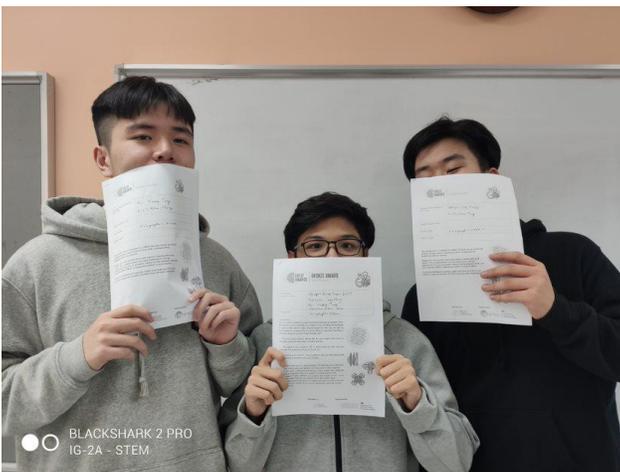




NEWSLETTER

IGCSE 2A

“Project: Research one latest advancement in science and information technology, and its possibility of failure or success in the future.”



Science and technology is evolving rapidly, enabling a faster change and progress. In order for us to know which skills will help students in the future, research is a must. These groups of students are researching the following trends and its possibility of success and failure in the near future.

- Augmented reality and holographic screen
- Artificial Intelligence

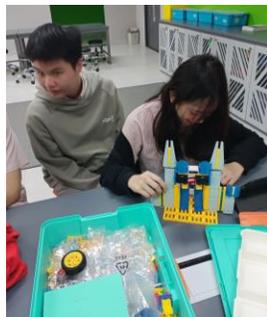
The students are expected to present their research papers on week 7 - Term 4.



NEWSLETTER

IGCSE 2B

IGCSE 2B students have experienced building Programmable Jimu Robot - Advanced Level in their STEM class during term 3. Easy building, coding, tablet integration. Developing it is what excites and engages students to find the program enjoyable and rewarding.



With these experiences, students will now be able to prepare for the next level which is the UBTech JIMU Explorer. They will engage in hands-on STEM learning by programming JIMU robots to walk, dance, or more using Blockly code or with the PRP (Pose, Record, Play) function. This will be done in the last term of the school year. JIMU Robot is an interactive building block robotics kit that empowers students to create and program their own robots. Students gain 21st-century skills and mindsets.





NEWSLETTER

IGCSE 2C

The use of socially interactive games in learning and teaching mathematics and science is credible. One of the objectives is to integrate the checkerboard game into the teaching of mathematics and science concepts and skills.



Term 3 on IGCSE 2C students paved the way to form a similar project to acquire learning which could be a help to them in their real life. The game raises the level of challenge, making the game exciting, tough experience for any players participating. Any game can be trivial or worthwhile. It all depends on the players of the game and when and why. These games are originally designed especially for students to make them do and play mathematics - science, have fun with it in thinking, making a game plan, and using their common sense, honesty and fair play.

