

## GMS(S) Applied Learning Programme in Science (ALP)

This is a three-year programme centered on Environmental Science and Sustainable Living.

At Tier 1, all Secondary 1 students learn about human activities that bring about the Urban Heat Island (UHI) effect and its implications in Singapore. Students are then given the opportunity to work in groups to showcase their creativity and apply their knowledge by designing and constructing a model green building that would best minimise the effects of UHI. With effect from May this year, there is a tweak to the Secondary 1 programme albeit still focus on UHI. Over a span of 10 one-hour sessions, students will explore STEM through inquiry-based experimentation, using computational thinking, design thinking, coding and building blocks (Lego) to come up with prototype ideas for Environmental Sustainability (Conservation of Energy) such as Automated Curtain Opener with Servo, Smart Night Light with Photoresistor and Smart Room Lighting with Ultrasonic Sensor.

Secondary 2 students are introduced to the concept of urban agriculture in a land-scarce urban environment such as Singapore through hands-on activities and learning journeys. Students are engaged in hands-on experiments and consolidate their learning by germinating and nurturing the growth of a leafy vegetable in the school's greenhouse using 2 hydroponic systems, Nutrient Film Technique (NFT) and Deep Water Culture (DWC), over a span of 20 weeks. Students also get to practise and hone their research skills in a 10 week Research Phase.

In 2024, we strengthened our focus on sustainability, with a collaboration between the Science Dept and D&T/FCE Unit. During the D&T lessons the students built portable plant holders using recycled pet bottles, students then used these plant holders during Science lessons for growing of mint leaves which are in turns used by the students during their FCE lessons as garnishing in the dish they prepared in the school kitchen.

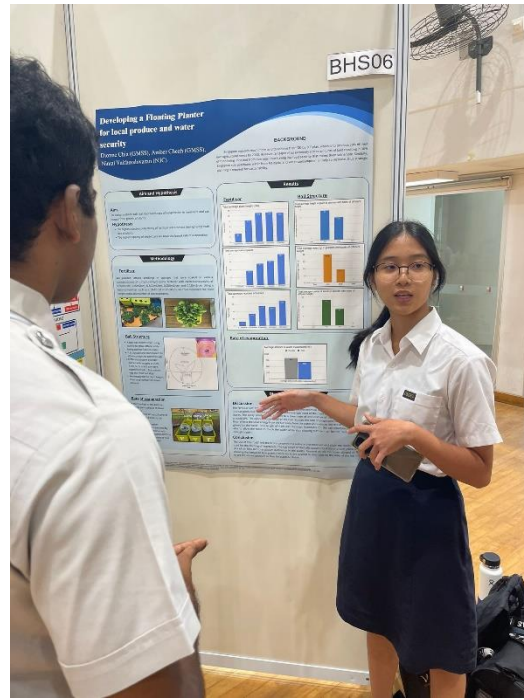
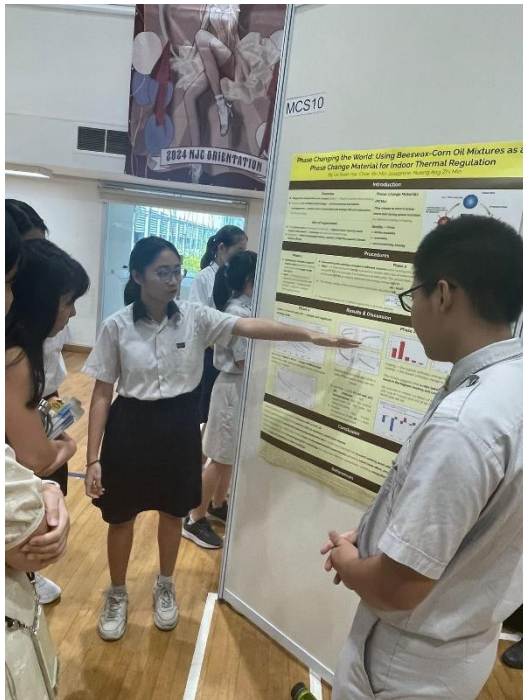
At tier 2, selected Secondary 3 students who have shown passion and interest in Science, Technology, Engineering and Mathematics are tasked with a project where their scientific knowledge will be deepened and used to solve authentic problems. Since 2021, the school has had a joint collaboration with National Junior College on the tier 2 STEM research project. The two Science Research Projects conducted in collaboration between NJC and GMS(S) last year were shortlisted for Singapore Science and Engineering Fair (SSEF) 2024 Final Judging. One of the research projects entitled Phase Changing the World: Using Beeswax-Corn Oil Mixtures as a Phase Change Material for Indoor Thermal Regulation won the prestigious James Dyson Foundation Design Engineering Award. The Tier 2 Applied Learning Programme in Science exemplifies our commitment to nurturing the next generation of innovators and problem-solvers. Through hands-on research experiences and collaborative projects, students develop critical thinking skills, scientific literacy, and a passion for making meaningful contributions to society.



Red Bayam grown in the Nutrient Film Thin (NFT) hydroponics at the school's greenhouse.



Sec 2 students enjoying their harvest.



GMS(S) and NJC joint research project won a special award category at the 2024 Singapore Science and Engineering Fair (SSEF).