

EMPOWERING STEM EDUCATION PROFESSIONALS PROGRAMME

2022/2023



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Think like a _____, Design like a _____.
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FOREWORD

The third Empowering STEM Education Professionals Programme (ESEPP) was organised by meriSTEM@NIE with the generous sponsorship of ExxonMobil. This programme is a platform for teachers, industry partners, institutes of higher learning, and the Ministry of Education to share STEM lesson ideas, and foster opportunities to network as a STEM community.

The 2022–2023 ESEPP kickstarted with an online workshop on 9th of November 2022, followed by a competition themed, Think like a _____, Design like a _____, and a concluding presentation and award ceremony on 26th May 2023. Designed as an open theme, the competition sought to inspire teachers to design more diverse and integrated STEM activities.

It was heartening to receive 15 entries from over 17 different schools, particularly during a period of transition, as Singapore continued to adjust to the post pandemic new normal. Notably, a strong spirit of collaboration could be felt among our schools, with entries stemming not only from groups with team members from different disciplines, but also from different schools across Singapore.

The STEM lesson ideas were of high quality and the judges were most impressed with the creativity and authenticity of the entries. Lesson plans were crafted based on globally relevant issues tailored to Singaporean contexts, making learning a more meaningful and personal experience. The panel of judges picked four winning entries, two from primary schools and two from secondary schools.

This booklet collates the lesson ideas from all the entries. In sharing these lesson ideas, we hope that more teachers will be INspired to INquire about, INtegrate, and INnovate STEM lessons into their classrooms. Lastly, we hope that these lesson ideas will encourage and motivate you to take a step forward in your STEM teaching and learning journey, and be a part of a robust community of like-minded STEM educators passionate about integrated STEM education.

Thank you.

Associate Professor Tan Aik Ling

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EMPOWERING STEM EDUCATION PROFESSIONALS PROGRAMME

Background

meriSTEM@NIE aims to lead and catalyse STEM (science, technology, engineering and mathematics) education research, teaching and partnerships in Singapore so that future generations of educators, learners, and citizens can harness relevant STEM knowledge and skills to address current and emerging challenges and adapt to an ever-changing and progressing landscape.

It organises the Empowering STEM Education Professionals Programme (ESEPP) to enhance the quality of STEM literacy; build a community of STEM educators in Singapore; encourage more pervasive adoption of STEM education in schools located in Singapore; and build partnerships between schools, NIE and industries for STEM education in Singapore.

Participants attend a workshop before the competition to understand the principles of designing an instructional lesson package that incorporates the elements of STEM. As part of the competition, participants submit an instructional lesson package based on a theme proposed by the organisers. This is followed by a sharing session where participants, industry partners, and faculty from institutes of higher learning gather to converse, share and learn from each other.

ESEPP is held at a national level and is open to all primary and secondary school teachers.

ESEPP 22/23

Think like a _____, design like a _____.

The theme for ESEPP 22/23 was Design like a _____, Think like a _____. For the third run of this competition, we decided to have a more open theme, to allow teachers to design more diverse and creative integrated STEM activities that promote student engagement with design and encourage scientific reasoning and logical thinking to create sustainable, human-centric, replicable, scalable, and meaningful solutions for the wider community.

A total of 15 lesson packages were received. In the primary school category, there were 6 entries from 5 schools, as one school submitted 2 entries. In the secondary school category, there were 9 entries from 12 schools, as one team comprised of members from 4 different schools. All entries were judged in April 2022.

From floating farms, to being a plant whisperer and designing a modern-day scarecrow, the lesson packages showcased the innovativeness, creativity, and competencies of the teachers in generating engaging lesson ideas that integrate and develop students' knowledge and skills in STEM.

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WINNERS

Primary Category

Kang Hui Chin Jane, Long Miaw Ying, Sia Pei Fen Dawn,
and Ong Xuan You Joel

WESTWOOD PRIMARY SCHOOL

Think Like an Urban Planner, Design Like a Floating-farm Farmer

Oh Ling Fang, Joey Tan Jing Jie, Joanna Tan Ming Yi, Lim Gek Wah,
Poh Bee Leng Anne and Tow Poh Huay Adeline

PUNGGOL PRIMARY SCHOOL

Think Like a Fowler, Design Like an Engineer

Secondary Category

Boon Lishi Lisa, Mohammad Alfiyan Ahmad Buhari, Ong Seow Wei,
Kasthuri Silria Sullivan and Zhang Jingda

NAVAL BASE SEONDRARY SCHOOL

Think Like a Plant Whisperer, Design Like an Urban Farmer

Kee Jing Yee, Lau Shi Yun, Fu Ruiqi, and Wong Koi Lin

WOODLANDS SECONDARY SCHOOL, SCHOOL OF SCIENCE AND TECHNOLOGY
SINGAPORE, RIVER VALLEY HIGH SCHOOL, QUEENSTOWN SECONDARY SCHOOL

Think Like A Sea Turtle, Design Like A Polymath

PARTICIPANTS

Primary Category

Rosli Abdullah, Sueriaty Abdul Khalil, H Fazeelathunnisa,
Ahmad Bahktiar Othman, Rizal Jailani, and Siti Adriana Ramlan

MADRASAH IRSYAD ZUHRI AL-ISLAMIAH
Finding Our Trash-sure

Yeo Ailing Christine, Teou Lay Yen, Vincent Koh Hoon Hwee, Tan Ai Kiam,
Koh Chee Ting, and Wong Mei Fong

PUNGGOL PRIMARY SCHOOL
Think Like a User, Design Like an Engineer

Tay Ei Leen, Toh Yuet Leng, Kristene Chan Yan Jun, and Tan Cailing Corinna

SINGAPORE CHINESE GIRLS' PRIMARY SCHOOL
Think Like an Environmentalist, Design Like an Environmentalist
(Alleviate Flooding in Singapore)

Tan Shu Tian, Cheryl Nonis Dorothy, Chia Angela, and Wong Shyh Jiun

ST ANTHONY' S PRIMARY SCHOOL
Think Like a Scientist, Design Like an Engineer

PARTICIPANTS

Secondary Category

Abdul Male Bin Osman, Safura Binte Abdul Karim,
Peh Ang Tiong, and Cherie Chow Min Er

BEDOK VIEW SECONDARY SCHOOL
Sustaining Food Model

Chng Jun Liang Emmanuel, Lei Peishan, Chan Suz Yi, Kuan Wai Kit, and
Mohammad Firuz bin Mustapha

COMPASSVALE SECONDARY SCHOOL
Building and Testing Your Own Catapult

Chen Shunfa, Low Jin Hao, Vincent Lew, and Kee Zhi Yin

DUNMAN HIGH SCHOOL
Think like a Sustainable City Planner, Design Like a Sustainable City Planner

Ong Chin Leng, Adeline Yong Yean Pin, Lee Pooi San,
Jeffrey Jefferson Gafar, and Chu Khoo Hwa

DUNMAN SECONDARY SCHOOL
Think Like a (MOH) Policymaker, Design Like a (Health) Buddy

Teo Hui Yi, Ting Hui Xin, Ng Ai Zi Sheena Wijaya,
Wang Hwee Xuan Cessaline, Tan Sze Jiin, and Wang Shiyun

NANHUA HIGH SCHOOL
Integrative STEM Project on Energy Changes

PARTICIPANTS

Secondary Category

Ryf Zaini, Celeste Lin, and Yu Seng Er

SCHOOL OF THE ARTS

Think Like an Artist, Design Like an Environmentalist

Jismyl Lam, Aileen Nam, Tan Seng Kwang, and Chew Yi Yang

TEMASEK JUNIOR COLLEGE

STEMming the Tide: The Role of Science, Technology, Engineering and Math in
Pandemic Preparedness



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We wish to show our appreciation to...

ExxonMobil for their generous support and partnership in this event. The insightful talk on the need to strike a balance between deep disciplinary knowledge and systems thinking, gave us much to consider as we set about designing authentic and meaningful integrated STEM lessons.

Our colleagues from NIE who generously helped with the organisation of the event. We appreciate your time, effort, and patience throughout the entire process.

Our judges for taking time to read, comment and review the entries. We hope you enjoyed the process.

The participating teams of teachers. Your belief in your ideas, your love for your profession, and your thirst for continuous improvement is contagious! Without you, this event would not have been possible.

Thank you, everyone!

Visit <https://www.meristem.site/> to find out more.