



Empowering STEM Education Professionals Programme 21/22



An Institute of





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FOREWORD

The second Empowering STEM Education Professional Programme (ESEPP) was organised by meriSTEM@NIE with the generous sponsorship from ExxonMobil and the support of the Curriculum Planning and Development Division (Sciences) of the Ministry of Education. ESEPP provides a platform for teachers, university faculty, industry partners, and the Ministry of Education to share STEM lesson ideas.

Similar to the inaugural run last year, we received 20 high-quality STEM lesson idea entries from primary and secondary schools across Singapore. This is encouraging considering the challenges and demands on teachers' time as schools cope with the pandemic. It was heartening to receive entries submitted by teachers from different schools. It is evident that the spirit of collaboration is strong among our schools.

The teams of teachers proposed different lesson ideas related to the theme of Edible Landscapes. The notion of sustainable and secure food supply for Singapore has been made more acute with the pandemic. This theme aimed to inspire reflection on, and ideas related to, sustainable food supply in Singapore. The panel of judges deliberated, and we picked four winning entries, one from primary school and three from secondary schools, from ESEPP21/22.

This booklet curates the lesson ideas of all entries. We hope that through sharing these lesson ideas, more teachers would be inspired to infuse integrated STEM lessons in their classrooms. Sharing these lesson ideas is one step toward building a community of educators who are keen on integrated STEM learning.

Thank you.

Associate Professor Tan Aik Ling

Deputy Head (Teaching and Curriculum Matters)
Natural Sciences and Science Education Academic Group
Core Team Member, meriSTEM@NIE
National Institute of Education, Singapore

Empowering STEM Education Professional 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 are able to harness relevant STEM knowledge and skills in addressing current and emerging challenges for self and others.

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. The programme, held at a national level, consists of a workshop, competition and sharing session.

ESEPP is open to all primary and secondary school teachers. Participants attend a workshop before the competition to understand the principles of designing an instructional lesson package incorporating the elements of STEM. As part of the competition, participants submit an instructional lesson package based on a theme which the organisers have proposed.



ESEPP 21/22: Edible Landscapes

The theme selected for ESEPP 21/22 was Edible Landscapes as the need for a sustainable and secure food supply for Singapore has become increasingly acute due to changes as a result of the pandemic. Being able to supply some of our nutritional needs ourselves helps to ensure our survival in uncertain times.

A total of 20 teams of teachers from 4 primary and 16 secondary schools submitted their lesson packages for the competition. All entries were judged in April/May 2022.

The lesson packages showcased that many teachers are innovative, creative, and competent in generating lesson ideas that engaged students to appreciate the necessity for sustainable way to ensure our nutritional needs.

Supported by

ExxonMobil

WINNERS

[Primary Category]

**Nurul 'Iffa Binte Omar, Rosli Abdullah, Sueriaty Binte Abdul Khalil,
Zuraidah Binte Abdul Karim, Kasmawati Binte Kassim,
Nur Hidayah Binte Murad**

MADRASAH IRSYAD ZUHRI AL-ISLAMIAH

Edible Landscapes

[Secondary Category]

**Lim Xinjie, Lee Xin Er, He Caiqing, Liang Huiyi Winnie,
Adeline Yong Yean Pin, Jeffrey Jefferson Gafar**

CEDAR GIRLS' SECONDARY SCHOOL, DUNMAN SECONDARY SCHOOL

Edible Landscapes

**Chen Shunfa, Lee Seng Lee, Adrian Ong Wei Xiang,
Zhao Bolun Ian, Chang Wan Yin**

DUNMAN HIGH SCHOOL

Urban Farming

**Ng Bing Fu, Wong Hei Man, Thenmozhi Nalathambi,
Tan Yin Chin, Arion Lai Jia Hui, Lee Xiu Ping**

PEIRCE SECONDARY SCHOOL

Project Grow Local

PARTICIPANTS

[Primary Category]

**Chan Ng Poh Huat Paul, Tan Mei San, Ameer Ahamed Khan,
Emi Ng Huilin, Poh Jia Lin Josephine**

CHONGZHENG PRIMARY SCHOOL

Chongzheng's Project G.R.E.E.N.

**Nurul 'Iffa Binte Omar, Rosli Abdullah, Sueriaty Binte Abdul Khalil,
Zuraidah Binte Abdul Karim, Kasmawati Binte Kassim,**

Nur Hidayah Binte Murad

MADRASAH IRSYAD ZUHRI AL-ISLAMIAH

Edible Landscapes

**R Parvathy, Mohamed Hanifa, Seow Guat Leng, Lee Chee Mun,
Low Rhui Yin, Chan Eliza Jane**

ROSYTH SCHOOL

*Exploring Materials**

Wu Puwen, Yeo Quan Kai, Nicole Venturi, Chrispian Tirtamaya

ST STEPHEN'S SCHOOL

Transform Your Vegetable Scrap into Another Meal

**The judges noted that this entry does not adhere to the theme of Edible Landscapes.*

PARTICIPANTS

[Secondary Category]

**Chew Jian Zhen Geraldine, Tay Hong Chan,
Tow Swee Ai Emily, Tay Mui Kim**

AHMAD IBRAHIM SECONDARY SCHOOL

Ahmad Ibrahim Secondary School, ESEPP 21/22 Entry

**Ong Shu Hui, Foo Chuan Wang Derek, Leow Li Ting,
Yee Chung Mun, Goh Ying Shi Darwin**

ANDERSON SERANGOON JUNIOR COLLEGE

Food Sustainability in Singapore

**Tang-Lee Choon Tien, Tan Chee Seng Terence,
Leow Dai Jing, Leow Wee Meng Frankie**

BEDOK GREEN SECONDARY SCHOOL

From BGSS Edible Garden to Table

**Lim Xinjie, Lee Xin Er, He Caiqing, Liang Huiyi Winnie,
Adeline Yong Yean Pin, Jeffrey Jefferson Gafar**

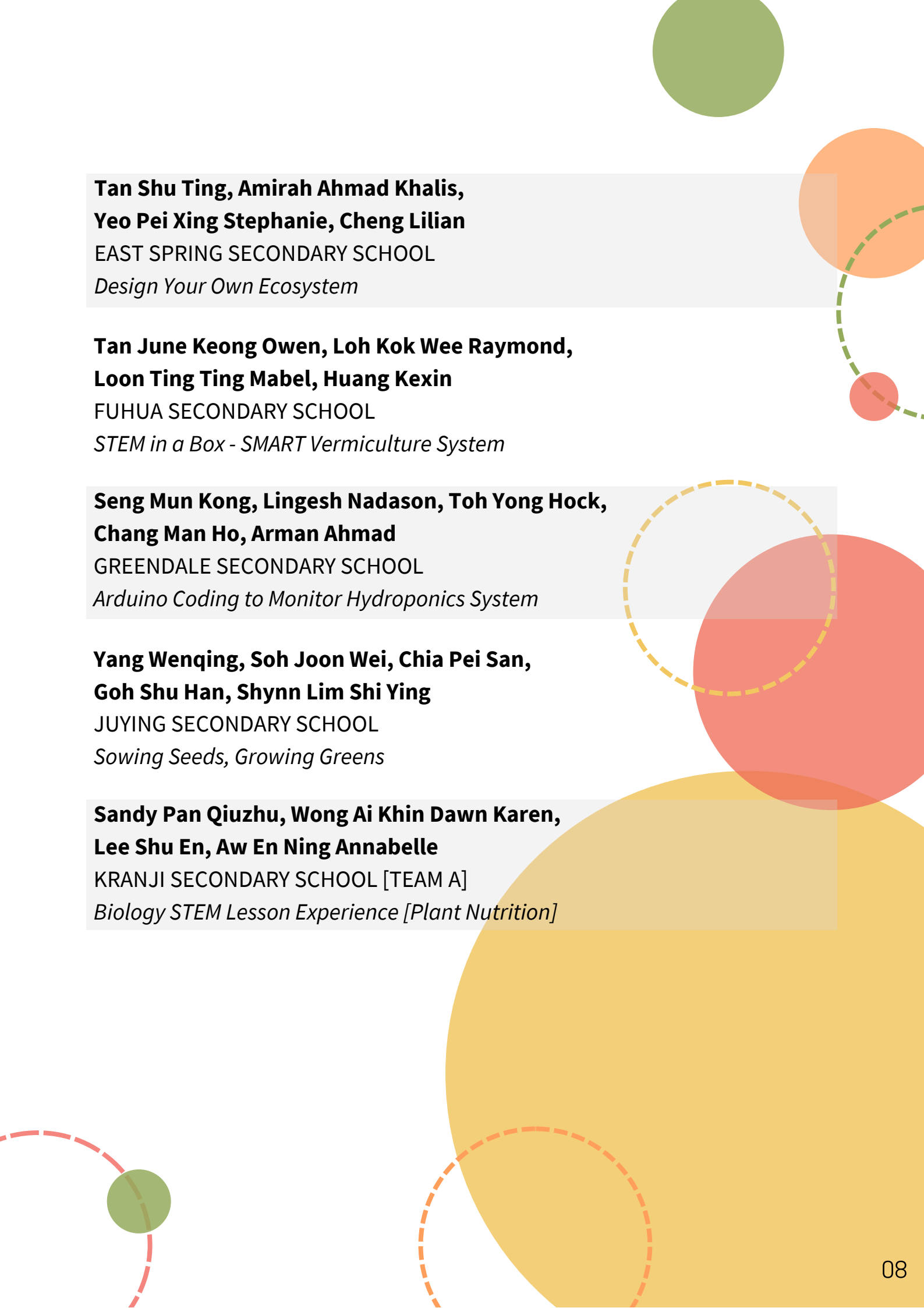
CEDAR GIRLS' SECONDARY SCHOOL, DUNMAN SECONDARY SCHOOL

Edible Landscapes

**Chen Shunfa, Lee Seng Lee, Adrian Ong Wei Xiang,
Zhao Bolun Ian, Chang Wan Yin**

DUNMAN HIGH SCHOOL

Urban Farming



**Tan Shu Ting, Amirah Ahmad Khalis,
Yeo Pei Xing Stephanie, Cheng Lilian**
EAST SPRING SECONDARY SCHOOL
Design Your Own Ecosystem

**Tan June Keong Owen, Loh Kok Wee Raymond,
Loon Ting Ting Mabel, Huang Kexin**
FUHUA SECONDARY SCHOOL
STEM in a Box - SMART Vermiculture System

**Seng Mun Kong, Lingesh Nadason, Toh Yong Hock,
Chang Man Ho, Arman Ahmad**
GREENDALE SECONDARY SCHOOL
Arduino Coding to Monitor Hydroponics System

**Yang Wenqing, Soh Joon Wei, Chia Pei San,
Goh Shu Han, Shynn Lim Shi Ying**
JUYING SECONDARY SCHOOL
Sowing Seeds, Growing Greens

**Sandy Pan Qiuzhu, Wong Ai Khin Dawn Karen,
Lee Shu En, Aw En Ning Annabelle**
KRANJI SECONDARY SCHOOL [TEAM A]
Biology STEM Lesson Experience [Plant Nutrition]

**Yarong Yang, Karen Wong, Felicia Mah,
Liu Jiaman, Ong Zhen Hui, Cynthia Wong**
KRANJI SECONDARY SCHOOL [TEAM B]
*DIY Thermal Container**

**Ong Qi Ting, Chong Keting, Lim Leck Lee,
Chen Huiting, Zheng Jiahui Esther, Joel Lee Jiawen**
KRANJI SECONDARY SCHOOL [TEAM C]
Kranji Secondary School Team C_ESEPP 21/22 Entry

**Timothy Ting, Lim Shu Qing Carine, Joanna Ho Mingyi,
Michelle Tan, Lim Chee Tiong**
NORTHBROOKS SECONDARY SCHOOL
DIY Hydroponics System: Herb Propagation

**Ng Bing Fu, Wong Hei Man, Thenmozhi Nalathambi,
Tan Yin Chin, Arion Lai Jia Hui, Lee Xiu Ping**
PEIRCE SECONDARY SCHOOL
Project Grow Local

**Wong Jinfa, Tan Xiang Yeow, Crystal Tan Kia Hin,
Fong Jia Hui, Matt Yee Liang Chien**
RAFFLES INSTITUTION, SERANGOON SECONDARY SCHOOL
Home-made Vertical Farming System of Microgreens

**Pang Jeng Heng, Koh Chee Kiang, S. Mathivanan,
Raksha Manoj Sajnani, Danial Bin Mazlan, Lan Ruiting**
VICTORIA SCHOOL
Introduction to Edible Landscape in Victoria School

**The judges noted that this entry does not adhere to the theme of Edible Landscapes.*

Acknowledgements

We wish to show our appreciation to ...

ExxonMobil for their generous support and partnership in this event. Additionally, it was an eye opener for many of us to hear about the role of energy in all aspects of our lives.

Our colleagues from NIE who have so generously given their time and effort to help with the organization of the event. We appreciate your patience in explaining all the workflow processes to us.

Our judges for taking time to read, comment and judge 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!

