

ECC Education for Sustainable Development Series: Building a Green School – Environmental Education Practice and Experience Sharing Session

15 October 2026
SMCESPS

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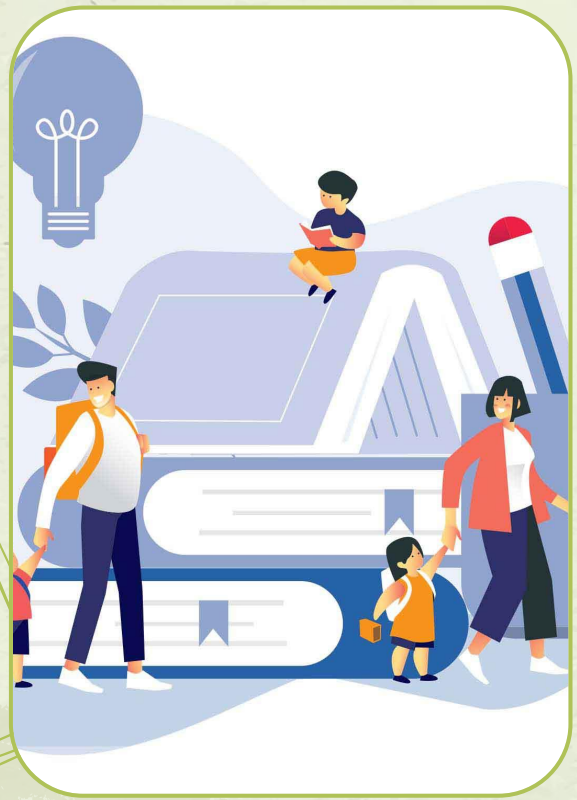
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01

School background

School background

- Founded in 1965
- A catholic DSS school in Sham Shui Po district
- Through train school, both secondary and primary students sharing the school campus
- Whole-person education, nurturing global citizens who are physically and mentally healthy, have the courage to take on social responsibility

止於至善 ST. MARGARET'S 明德新民





02

Programme Background

Context

The Chief Executive's 2022 Policy Address:
"...step up the promotion of STEAM education "for all", "for fun" and "for diversity" in primary and secondary schools...."

The Chief Executive's 2023 Policy Address:
"...further strengthen the promotion of STEAM (Science, Technology, Engineering, the Arts and Mathematics) education in primary and secondary schools, including the introduction of Science subject in primary schools..."

Programme background

External resources:

"Cyberport and the Education Bureau (EDB) are joining forces to provide professional I&T training to STEAM educators in primary and secondary schools. They recently launched the "Professional Development Programme on Innovation and Technology for STEAM Co-ordinators of Schools..."

Strategic Partners and Sponsors:

Farmacy HK Limited, Social Innovation and Entrepreneurship Development Fund of the HKSAR government, Oxfam, Lee Hysan Foundation and Kerry Properties Limited

數碼港 Cyberport

FARMACY 水耕細作

樂施會 OXFAM Hong Kong

The school major concerns

1: Nurturing Active Learners: Prioritizing Ownership, Reflection, and Adaptability



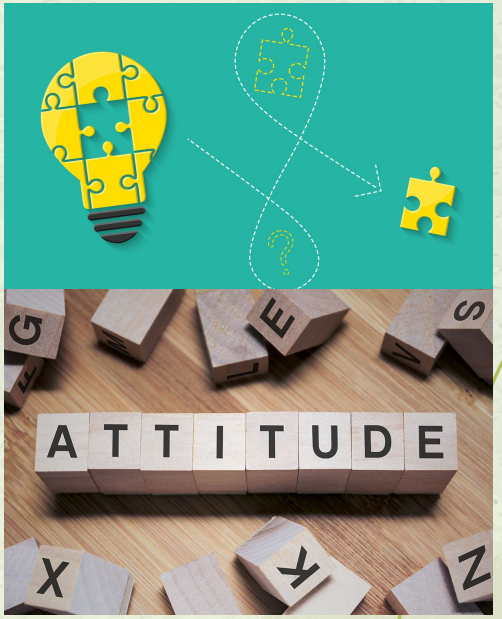
- Empower students to take ownership of their learning
- Foster reflection and self assessment
- Promote Cross-KLA Learning
- Enhancing students' adaptability to the ever-changing world

2: Strengthening Positive Education

- Promote well-being, healthy lifestyles, and integrate the 15-Core Value system in daily school life
- Strengthen students' and parents' sense of belonging towards the school and society

Programme background

- Applying knowledge and skills from across subjects to **solve problems** in an **authentic context**
- Nurturing **values and attitudes** such as active participation, co-operation, self-confidence, benevolence and empathy and etc. through **experiential learning**.





03

Programme planning & implementation

Theme:	Hydroponics and sustainable development	Level:	S.2 (~120 students)
Topic:	Establishing a virtual social enterprise for sustainable urban produce		
Subject and implementation approach:	Cross curricular project: 1. **Where did our food come from? Production and exportation of food** *(CES, Geog)* 2. **Social Entrepreneurship - sustainable modern farming** *(Chi, Eng, ML, Arts)* 3. **Precision agriculture and sustainability** *(Maths, Sci, ICT and STEAM)* 4. **Farmunity and healthy eating** *(PE, LVE)*		• 10-hour education programme • Lecture, workshop and practical in School based STEAM lesson *(STEAM, Sci, BAFS, LVE)*
Learning elements:	(CSE, Geog) • Import and export of food • Problems related to farming (Chi, Eng, ML, Arts) • Sustainable farming practices in different countries and their feasibility in Hong Kong (Maths, Sci, ICT and STEAM) • Scientific investigation • Carbon emission estimation • IoT and programming • Hydroponics and SDGs (PE, LVE) • Healthy diet and food safety • Smart farming in neighboring countries		• Food supply and food security in the past and in the current world & its relation to SDGs • Plant science • Hydroponics towards SDGs • Smart farm management and operation logistics • Budgeting, business pitching and marketing • Community service and social entrepreneurship

Programme overview:

Subject and implementation approach:	Cross curriculum project: 1. Where did our food come from? **Production and exportation of food** *(CES, Geog)* 2. **Social Entrepreneurship** - sustainable modern farming *(Chi, Eng, ML, Arts)* 3. **Precision agriculture and sustainability** *(Maths, Sci, ICT and STEAM)* 4. **Farmunity and healthy eating** *(PE, LVE)*	• 10-hour education programme • Lecture, workshop and practical in School based STEAM curriculum *(STEAM, Sci, BAFS, LVE)*
Evaluation methods of learning	• Subject teachers' assessment and observation on student work such as presentation, poster, slides, pitching deck and student-organised activities • Students' reflection • SHS • APASO-III	

Programme Implementation (structure)

Programme



A 10 hour education programme (after school time)	School based STEAM lesson (within timetable)	Extended learning activities
Lessons about 10 sub-topics	Farm operation, Community service, Marketing	Cross-curricular project, Expo, Media interview, primary club

1. 10 hour education programme (after school time)

Programme implementation (1)

Session	Topic
1	Introduction to smart farming and IOT technologies
2	Healthy lifestyle – taste and nutrition in green & eco-restaurant
3	Farming Impact Measurement, Reporting and Management
4	Plant cultivation & analysing growth trends
5	Technical criteria and legal standard
6	Impact measurement & community lens
7	Introduction to coding and automation
8	Lean production and cooperation with external partners
9	Setup a virtual social enterprise to collaborate with real business
10	Operation and achieve virtual financial sustainability

A 10 hour education programme
(after school time)

Related concepts about Sustainability

- **Environmental & Agricultural:** Hydroponics, carbon footprinting, and SDG alignment.
- **Social & Community:** Food donation, elderly visits, and social entrepreneurship.
- **Economic & Enterprise:** Smart farm management, budgeting, and restaurant pitching.
- **Tech & ESG:** IoT and hands-on ESG activities.


farmunity







2. School based STEAM lesson (within timetable)

Programme implementation (2)

School based STEAM lesson
(lesson timetable)

Lesson	7th period	8th period
1	Introduction of the project	Task introduction and grouping
2	Introduction to farm operations	Farm operation
3	Introduction to finance, sales and marketing	Farm operation (Group work)
4	Introduction to community service	Farm operation (Group work)
5	Preparation for outing and visits	
6	1st outing Marketing: visiting markets and restaurants Community service: visiting and meeting with service targets	
7	Preparation for outing and visits	
8	2nd outing Marketing: visiting markets and restaurants Community service: visiting and meeting with service targets	
9	Final presentation on learning	

Programme timeline:
Phase 1 (Sept - Nov)
Phase 2 (Nov - Mar)
Phase 3 (Mar - May)



Related concepts about Sustainability

- **Environmental & Agricultural:** Hydroponics, carbon footprinting, and SDG alignment.
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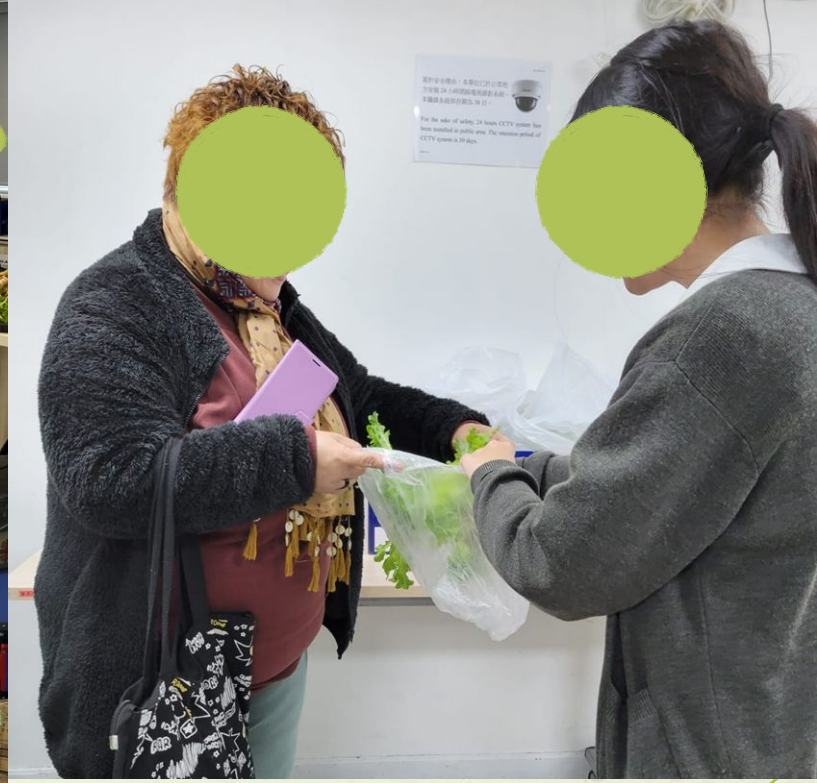




Farm operations







Service:
Vegetables donation to neighbourhood





Service:

Vegetables donation to neighbourhood Community service at elderly centre

Community service at school







ACTUAL INCOME			
	Unit Price (HKD)	Unit	Total Price(HKD)
Price of similar product in the market			0
Price of our product Kale	5	250	1250
Price of our product Bok Choy	2.5	496	1240
Product discount	0	0	0
Revenues			2490

ACTUAL EXPENDITURE			
Our Product Cost			
materials for planting (seeds, growing substrate, nutrient)	5	500	0
Electricity and water (Per month)	2000	1	2000
Human resources (per hour)	75	30	2250
Product package (Per pod)	1.5	500	750
logistics (per travel)	150	4	600
Total cost			5600
Balance			-3110

ESTIMATED INCOME			
	Unit Price (HKD)	Unit	Total Price(HKD)
Price of similar product in the market			0
Price of our product Kale	5	200	1000
Price of our product Bok Choy	2.5	200	500
Product discount	0	0	0
Revenues			1500
difference:			990



Marketing: Financial budgeting







Marketing: Pitching to local restaurants





Marketing:
Vegetable sales at school







Marketing: Vegetable sales at school

These are the suggested recipes



Bok choy chicken

Ingredients
- 150g boneless and skinless chicken breast
- 2 tablespoons oil
- 230g bok choy, sliced into pieces
- a little ginger, peeled and sliced into pieces

Marinade:
- 1/2 tablespoon soy sauce
- 1/2 tablespoon cornstarch

Sauce:
- 1/2 tablespoon oyster sauce
- 2 tablespoons water
- 1/4 teaspoon sesame oil
- 3 dashes white pepper
- 1/2 teaspoon sugar

Steps to make bok choy chicken:
1. Marinate the chicken with the marinade for 10 minutes. Combine all the ingredients in the Sauce in a small bowl, stir to blend well.
2. Cut the bok choy into pieces.
3. Heat 1/2 tablespoon oil in a wok until the oil becomes hot. Add the chicken and quickly stir-fry until the surface of the chicken turn opaque or white. Dish out and set aside.
4. Heat up the remaining oil in the wok until hot. Add the ginger into the wok and stir-fry until aromatic. Add the chicken back into the wok and do a few quick stirs. Add in the bok choy and stir to combine well.
5. Transfer the sauce into the wok and continue to stir-fry until the bok choy is cooked but remain crisp.



Macaroni and cheese with Kale

Ingredients:
- 8 ounces uncooked cavatelli pasta or other small shell-shaped pasta
- 1/4 cup plus 2 teaspoons kosher salt, divided
- 1 tablespoon extra-virgin olive oil
- 5 ounces baby kale (about 5 cups)
- 1 teaspoon black pepper, divided
- 3 tablespoons unsalted butter
- 3 tablespoons all-purpose flour
- 1 cup whole milk
- 1 cup heavy cream
- 1 cup buttermilk
- 8 ounces mild cheddar cheese, shredded (about 2 cups)
- 8 ounces sharp cheddar cheese, shredded (about 2 cups), divided
- 2 large eggs, beaten

Steps to make Macaroni and cheese with Kale:
1. Cook pasta according to package directions, adding 1/4 cup salt to boiling water. Drain; set aside.
2. Preheat oven to 375°F. Heat oil in a large (12-inch) ovenproof skillet over medium. Add kale by handfuls, stirring to wilt in between additions. Season with 1/2 teaspoon salt and 1/4 teaspoon pepper. Place kale on a paper towel–lined plate to drain. Wipe skillet clean.
3. Melt butter in skillet over medium. Add flour, and cook, whisking constantly, until mixture is very lightly browned, 1 to 2 minutes. Gradually add milk and cream, whisking to combine. Add buttermilk, whisking constantly, until completely incorporated. Cook over medium, whisking constantly, until mixture is smooth, thickened, and gently bubbling, 3 to 5 minutes. Remove from heat, and gradually whisk in mild cheddar and 1 cup sharp cheddar until melted and smooth. Whisk in eggs; fold in cooked pasta and drained kale. Season with remaining 1 1/2 teaspoons salt and remaining 3/4 teaspoon pepper. Sprinkle evenly with remaining sharp cheddar.
4. Bake in preheated oven until lightly brown and bubbling around the edges, 20 to 25 minutes. If desired, broil 1 to 2 minutes to brown the top. Let stand 5 minutes before serving.

Marketing: Vegetable sales at school (students' work)

Marketing: Vegetable sales at school (students' work)

Assessment: Reflection (students' work)

Reflections

Pitching Presentation could be better

- Too long
- Too boring and repetitive
- Could focus on main points more
- **Learnt about the importance of communication**

Isabella

We should check our plants more often

- check how it's changing process
- take more photo when it's growing
- listen to others opinions

Olivia

The speech could be smoother

- a bit of stutter while talking
- talk more about the details of the plant
- skip useless points

Alli

REFLECTIONS

Alex

- *the process of organizing the booth have taught me how to cooperate with teammates to divide work equally*
- *learnt the importance of adequate promotion of Farmunity to ensure a positive response and beneficial implementation*
- *acknowledged the importance of fulfilling my duty of regularly working at my booth*

Calissa

- through designing the booth, I have learnt how to make it attractive yet fun and engaging
- the community service allowed me to interact with kids
- learnt the importance of showing up

Ellie

- process of hydroponics farming
- how there are a plethora of alternatives in farming, which an help make crops more accessible
- the joy in packaging my own crops and seeing the students faces when they receive the vegetables

Pastel

- facts about farmunity that wasn't taught in class
- Learnt how to be responsible for the booth and how it can affect my future
- the process of packing vegetables into bags for delivery is fun

3. Extended learning activities

Programme implementation (3)

Extended learning activities:
Cross curricular project



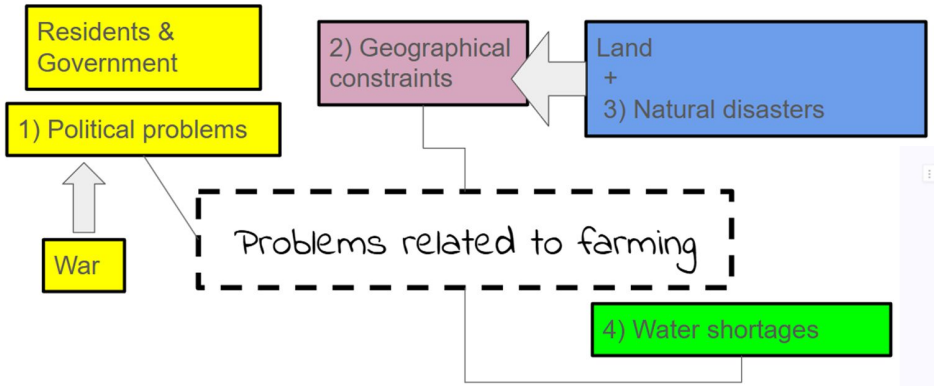


Farmunity and healthy eating *(PE, LVE)*

Social Entrepreneurship - sustainable modern farming *(Chi, Eng, ML, Arts)*

Programme implementation(3)

Extended learning activities:
Cross curricular project





Hunger threatens one in three Afghans

Without immediate funding, millions of people will go without the food they need. (sourced from news of 2025)

Where did our food come from? Production and exportation of food *(CES, Geog)*

Food demand in Afghanistan remains insecure, importing essential food from other countries. Meanwhile the local farming is significantly less, (there is no export for wheat/Flour). Which shows that local farming might need assistance and it's affecting the total amount of food in the country.

Programme implementation(3)

Extended learning activities:
Cross curricular project

Measuring Impact: Contributions to SDG Indicators

Relevant Indicators & Hydroponics' Role:

Indicator 6.3(Pollution Prevention)

Proper pH minimizes toxic runoff

Indicator 11.6(Reduce urban environment impact)

Urban hydroponic farms reduce food miles from 1,500km to <10km, cutting transport emissions by 99% per calorie delivered.

Indicator 12.3.1 (Global food waste)

30% less spoilage due to controlled environments

Interdisciplinary Integration:

Science: Suitable pH value optimize plant biology.

Mathematics: Calculate the carbon emissions of transportation .

ICT: IoT sensors track water/nutrient levels in real time.

Precision agriculture and sustainability *(Maths, Sci, ICT and STEAM)*

Measuring Impact: Contributions to SDG Indicators

Relevant Indicators & Hydroponics' Role:

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ICT: IoT sensors track water/nutrient levels in real time.

Programme implementation(3)

Extended learning activities





Learning & Teaching expo 2025

Extended learning activities: Primary interest club

PLANTAGRAM — THE DAILY BLOG OF PLANTS

LITTLE VEGGIE (RECORD BY Lorenzo, Tessa, Brittney)



DATE: 19/11/2023

STAGE: ☐ GERMINATION ☐ TRANSPLANT ☑ PLANT CARE ☐ HARVEST

PLANTS' CONDITION (APPROXIMATELY)

HEIGHT: 11.5 cm

WIDTH: 7.5

COLOR OF LEAVES: green

ENVIRONMENTAL FACTOR

☑ ENOUGH WATER SUPPLY

MY SHARING

Grew surprisingly big!

COMMENTS: I wanna eat it :D

LITTLE VEGGIE (RECORD BY Ocean, Harvey, Cheung)



DATE: 19/11/2025

STAGE: ☐ GERMINATION ☐ TRANSPLANT ☑ PLANT CARE ☐ HARVEST

PLANTS' CONDITION (APPROXIMATELY)

HEIGHT: 3cm

NUMBER OF LEAVES: 7

COLOR OF LEAVES: light Green

ENVIRONMENTAL FACTOR

☑ ENOUGH WATER SUPPLY

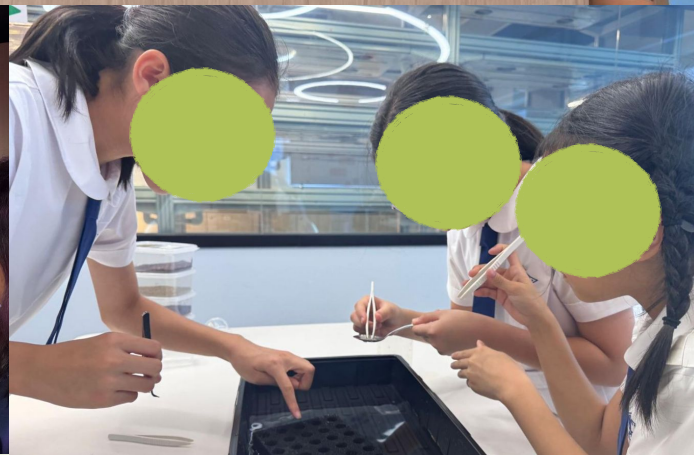
MY SHARING

big plants!!!

COMMENTS: I think is kinda good







Extended learning activities: Media interview





Programme reflection



- Establishing distribution channels
- Diverse learning needs and interests
- Communication and logistics when large number of students involved
- Co-planning on harvest goals



04

Programme continuous development

Three Learning Modules – Positive Education





Moss Ball Making

Three Learning Modules – Positive Education

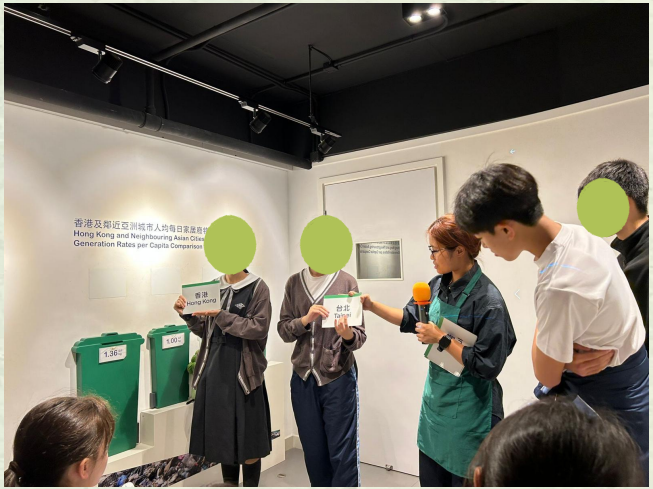






Tote Bag Making

Three Learning Modules – Community Service







Visited a NGO – Food Angel

Three Learning Modules – Community Service

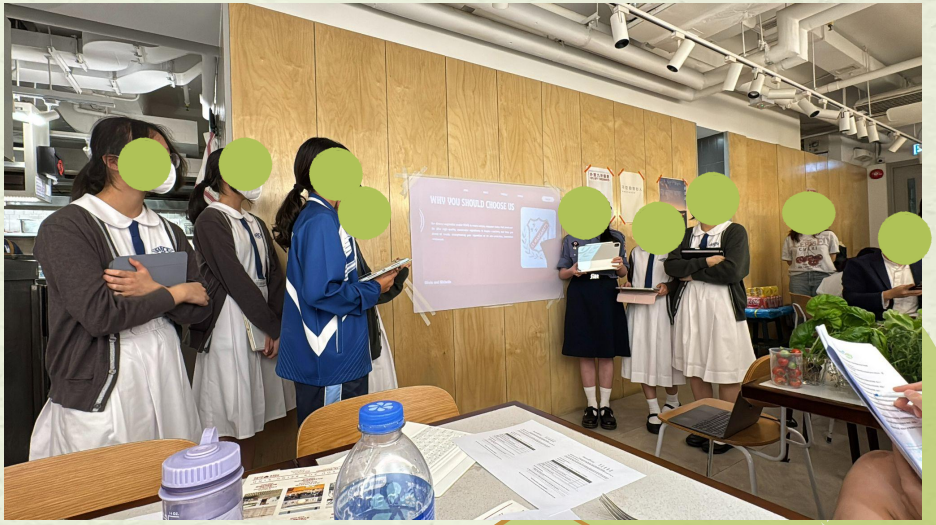




Immersive Learning: guess what were they watching!

Three Learning Modules – Entrepreneurship





Pitching in a local vegetarian restaurant – Years

Extended Learning Activities



Harvesting Vegetables for Donation



Pitching in a hotel

Extended Learning Activities





Summer Internship Program

Extended Learning Activities



Workshop for
Singapore Students



STEAM Week – Hydroponics experience



Extended Learning Activities





Promote our ideas and host hands-on activities for visitors from China.

Extended Learning Activities –
ESG Immersion Programme in Guilin (Coming Soon !)









- Farmacy hydroponic farm visit
- Horticultural therapy session
- Sensory nature walks
- Natural dyeing
- Dialogue with Esquel's sustainability team
- Student-designed mini ESG community projects