

Seminar on Encouraging a Low-carbon Lifestyle for Promoting Education for Sustainable Development

**School-based experience sharing
given by Dr. E Chau
SKH Tang Shiu Kin Secondary School**

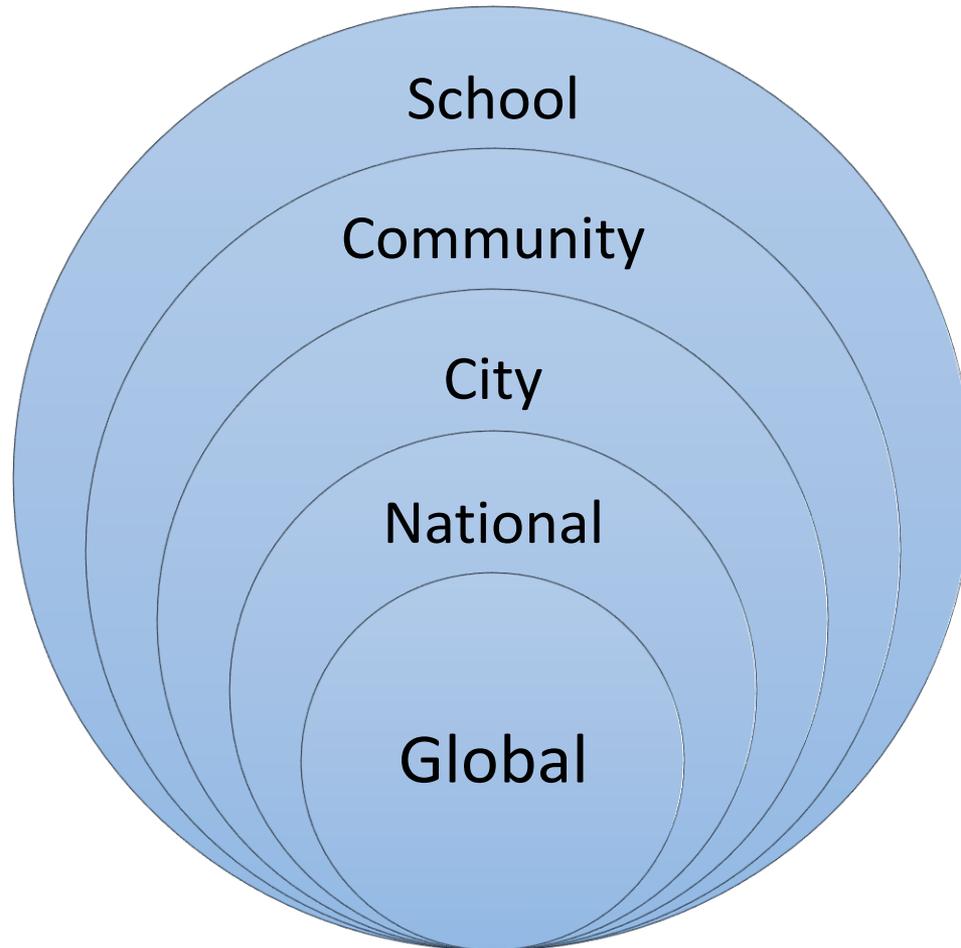
3 April 2017

Stages of the Design of EE programme



Needs assessment

- problem identification



HONG KONG

CLIMATE

CHANGE

REPORT 2015

Environment Bureau in collaboration with
Development Bureau, Transport & Housing Bureau
Commerce & Economic Development Bureau, Food &
Health Bureau, Security Bureau

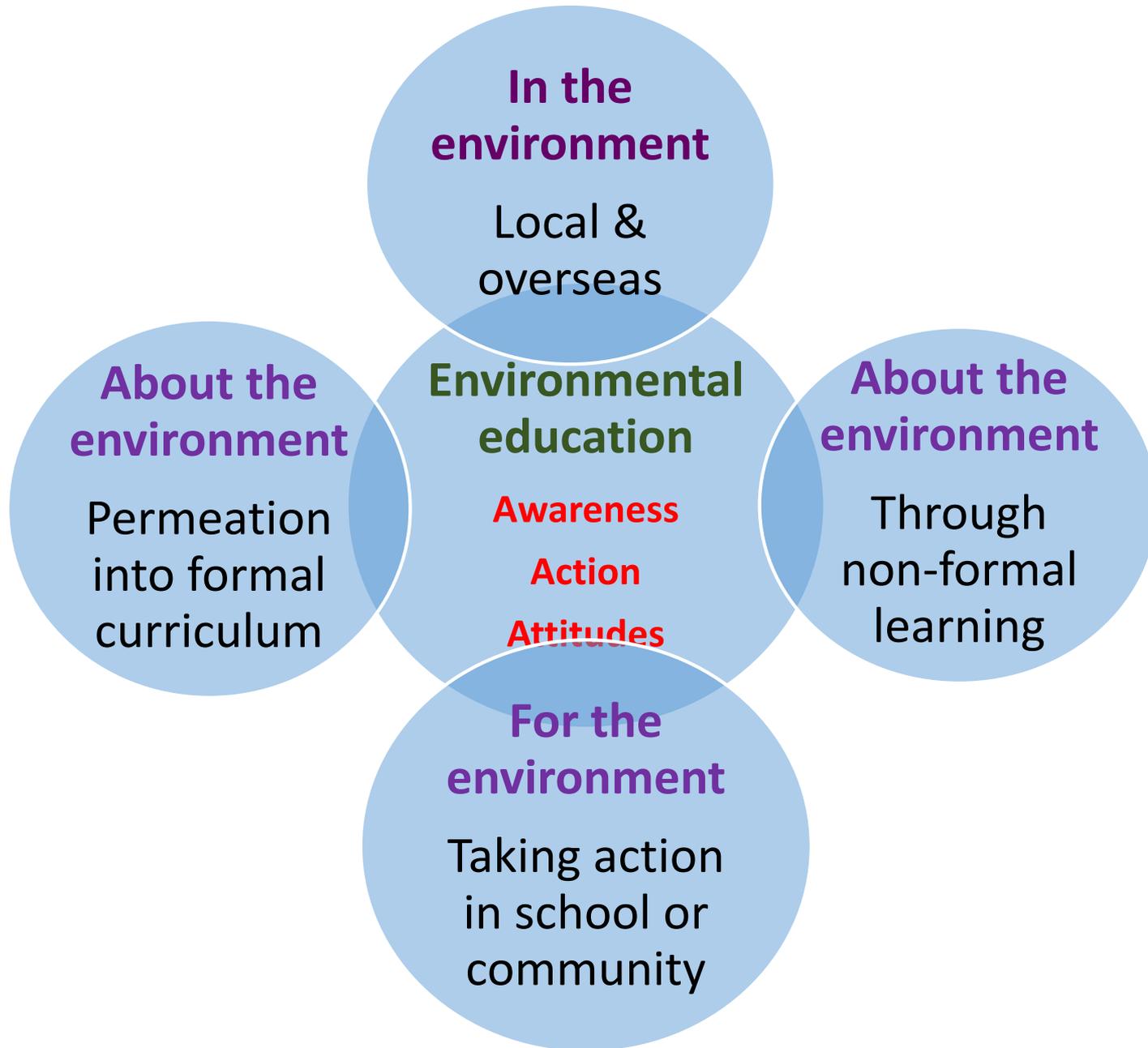
November 2015

× problem analysis: determine the causes

<http://www.ilocis.org/documents/chpt18e.htm>

<http://carbon-manager.hkpc.org/website/eng/intro.asp>

× Determining solutions



✘ Setting priorities

Knowledge *about* the environment

- Formal curriculum: Infusion into Geog, Science, Liberal Studies & language subjects in the whole year
- Non-formal curriculum: visit to Museum of Climate Change and, environmental workshops

Learning *in* the environment

- Local investigative study (research)
- ‘Go Green on Lamma Island’ Programme
- Caretakers of the Environment International (CEI) – Annual conference with guided tours

Concern *for* the environment

- Practise organic farming with the elderly in Wan Chai Park
- Inter-class mooncake box collection competition

fusion into F.3 geography curriculum

- * During lessons: Changing climate, changing environments
- * During morning reading session:
 - Reading books entitled 'Alleviating global warming: 21 things you can do in schools' published by Green Power
- * Pamphlet / Bookmark design competition
 - Climate change: what can we do to reduce the impact on wildlife?



Types of learning in the environment

Types of field trip strategy

- Instructional trips
- School contests
- Motivational trips

Types of field work

- Sensory fieldwork
- Field excursion
- Investigative fieldwork based on hypothesis-testing task / problem-solving task / decision-making task
- Field enquiry

<http://eprogressiveportfolio.blogspot.hk/2012/06/field-trip-strategy.html>

Intro Geography S1 Fieldwork Bk
Blue Mar
Pearson Education South Asia

Sensory Fieldwork

Field Excursion

Investigative Fieldwork

Enquiry Fieldwork

Intro Geography S1 Fieldwork Bk Blue Mar
Pearson Education South Asia

**Knowledge
about the
environment**

- Formal curriculum: Infusion into Geog, Integrated Science, Biology & language subjects in the whole year
- Non-formal curriculum: visit to Jockey Club Museum of Climate Change, and environmental workshops

**Learning *in* the
environment**

- Local investigative study (research)
- 'Go Green on Lamma Island' Programme
- Caretakers of the Environment International (CEI) – Annual conference with guided tours

**Concern *for* the
environment**

- Practise organic farming with the elderly in Wan Chai Park
- Inter-class mooncake box collection competition

	Instructional trips	School contests	Motivational trips
Sensory fieldwork			↑
Field excursion	Guided tours, e.g. tour in organic farms		'Go Green on Lamma Island' Programme
Investigative fieldwork			↓
Field enquiry		Local investigative study	

Setting aims and objectives

- **Setting aims**

To promote a low carbon lifestyle in students, and to develop their knowledge, skills and positive values and attitudes that enable them to make well-informed decisions and take action for the creation of sustainable environment

× Setting objectives

After the programme, students are able to:

Knowledge

- understand the causes and effects of greenhouse gases emission in Hong Kong
- discuss how different measures help to combat climate change

Skills

- evaluate the measures taken to combat climate change on Lamma Island

Attitudes

- recognise the importance of having low carbon lifestyle

Individual behaviour

- be willing to take action to combat climate change in their daily life

Social action

Conceptualizing content

Think what you want your students to learn in the programme



Making decision



Organizing the content



What you will teach in the programme

Factors affecting the selection of content

Significance

Issues
related to
climate
change

Validity

Accurate
content

Up-to-date
content

Consistent
with the
objectives

Interest

Meaningful
to students

Utility

Usefulness of the content: is it worth knowing?

Learners' ability

Students' prior knowledge

Suitability to students' academic ability

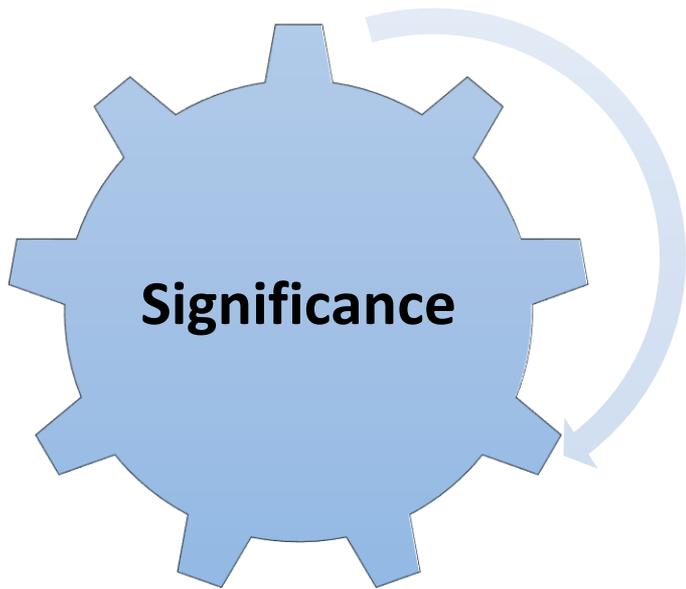
Suitability to students' physical ability

Feasibility

Availability of sites:
(accessibility and safety)

Resources

Time allowed



Content

Rubbish – what's the solution?

Eco shopping

Local farm: is it organic or not?

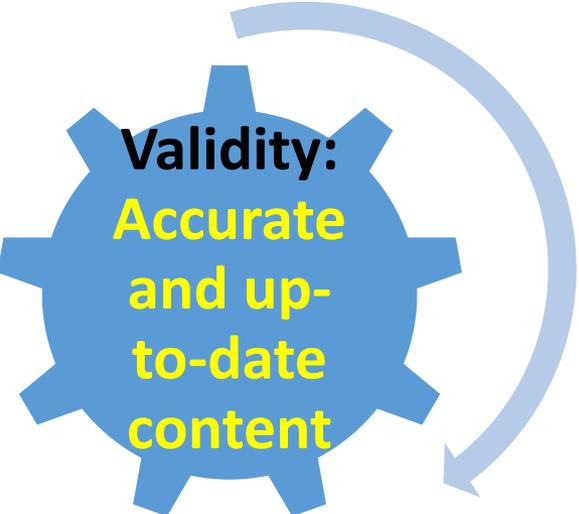
Can fuel mix alone help to combat climate change?

Is the use of renewable energy a way out in HK?

Can tree-planting scheme help to combat climate change in HK?

Is it possible to set up home farm to reduce carbon emission?

What is the impact of climate change on the wildlife on the mudflat?



Validity:

**Accurate
and up-
to-date
content**

**Rubbish – what's the
solution?**

*Pilot Community Recycling
Programme in Islands
District, closed loop
recycling, upcycling*

Eco shopping

*Organic and ecofriendly
products*

Local farm: is it organic or not?

Farming methods used in the farm

**Can fuel mix alone help to combat
climate change?**

*Operation in the power station
Impact of burning different types of fuels
on the environment*

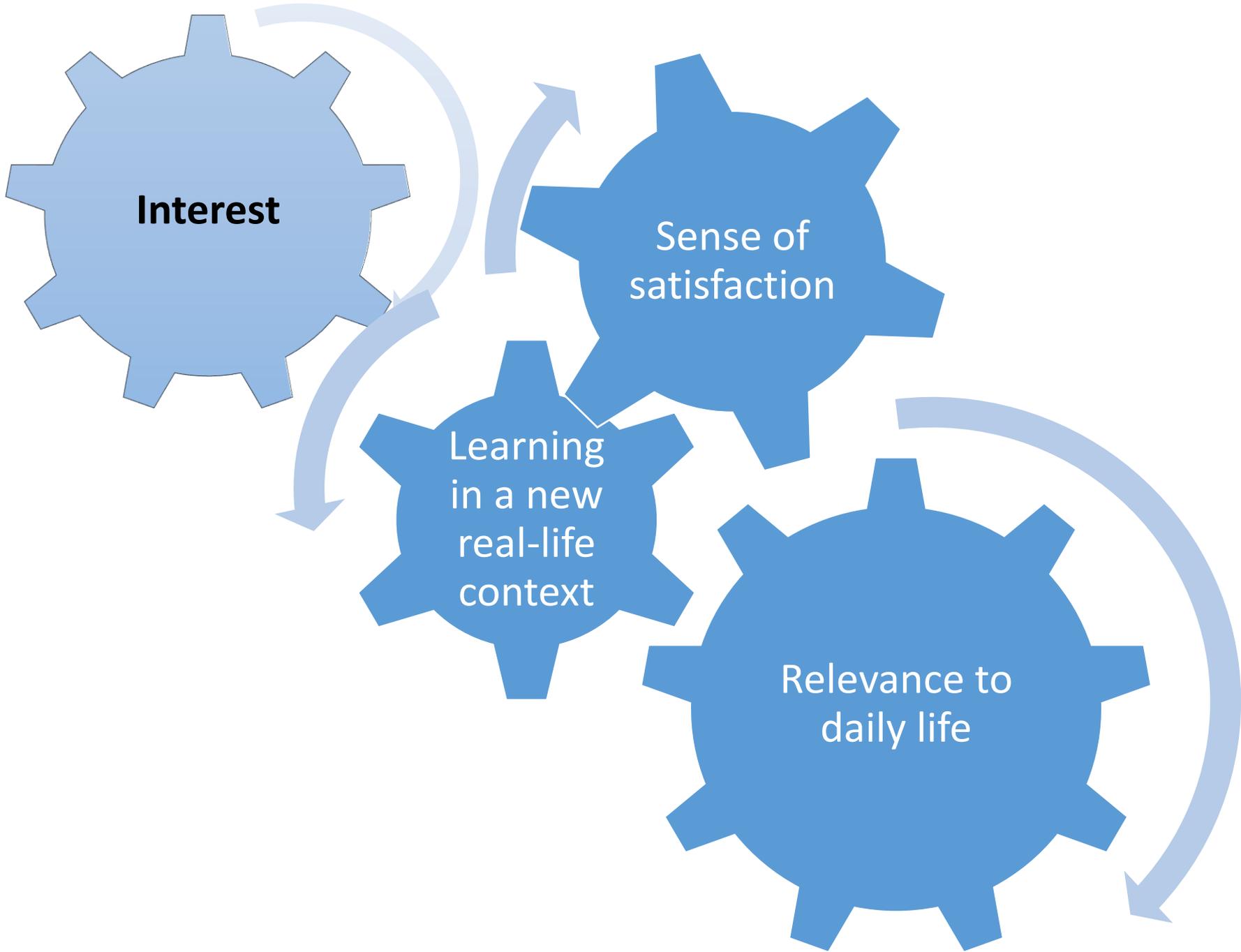
**Is the use of renewable energy a
way out in HK?**

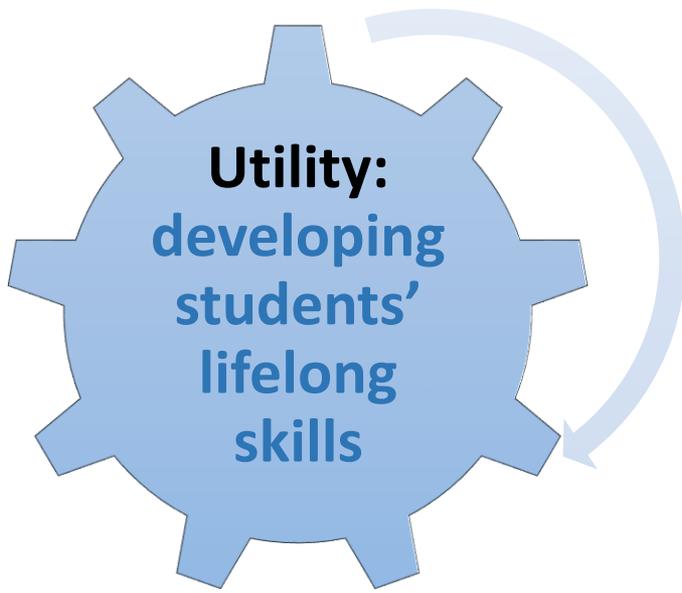
*Types of renewable energy in HK
Their advantages and disadvantages*

**Can tree-planting scheme help to combat
climate change in HK?**

*Indigenous plants vs exotic plants
Their effectiveness in combating climate
change*

 Validity: Consistent with objectives	To discuss how different measures help to combat climate change	To evaluate the measures taken to combat climate change on Lamma Island	To recognise the importance of having low carbon lifestyle	To be willing to take action to combat climate change in their daily life
Rubbish	✓	✓	✓	✓
Eco shopping	✓		✓	✓
Local farm	✓	✓	✓	✓
Fuel mix	✓	✓	✓	✓
Renewable energy	✓	✓	✓	✓
Tree-planting scheme	✓	✓	✓	✓
Home farm	✓		✓	✓
Impact of climate change			✓	✓





Develop the
habit of
reading
labels of
products

Know how to
make a wise
choice of
products

Know how to
have low
carbon living
in their daily
life

Learners' ability:
link to students'
prior knowledge

F.3

- Know the effects of global warming on the environment in Hong Kong
- Know the effects of global warming on sustainable farming methods

Lack of prior knowledge about the causes of global warming

F.4

- Know the causes and effects of climate change and the related measures taken locally, nationally and globally

F.5

- Know the causes and impact of global warming and the strategies used to cope with global warming

Pre-trip activity: Design a flow chart to illustrate how human activities cause global warming which brings some effects to Hong Kong.



Learners' ability:

**Suitability to
students'
academic ability**

Worksheet Set 1 – for average students

Worksheet Set 2 – for more able students

- Less guidance given to students
- More challenging questions
- More pre-trip activities for preparation at the beginning of some topics

Feasibility:

Sites

Resources

Time

Start at 9:35 a.m.

Collection points for recyclable materials and exhibition board for an introduction of the Pilot Community Recycling Scheme

Exhibition panels at Lamma Winds (with guided tour)

A big local farm

Interpretative plate at tree-planting site

Take ferry at 4:05 p.m.

Interpretative plate for mudflat

Briefing on upcycling and workshops in Lamma Corner and eco shopping in green shops

Lamma Power Station (with guided tour)

Home farm

Developing EE materials and activities

- Guidelines on developing EE materials & activities

Experiential learning

Learning based on first-hand experience

Learning through reflection on doing

Fairness

Balanced presentation of different viewpoints

Openness to inquiry

Reflection of diversity

Skills building

Critical thinking skills

Applying skills to issues

Action skills

Formation of attitudes

Open-mindedness

Respect for evidence

Critical reflection

Action orientation

Sense of responsibility

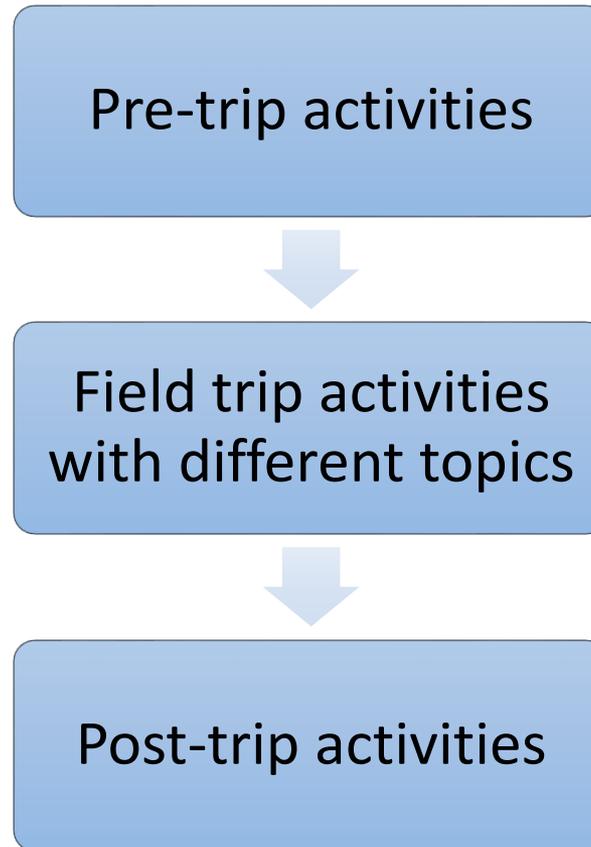
Self-efficacy

Personal participation

Working as individuals or in groups

Translating personal commitment into environmental protection

Organizing content and activities



- Pre-trip activities

TUNING IN

<https://www.pinterest.com/pin/350717889709565712/>



Tuning in

Get students engaged in thinking about the topic

- To sensitize and motivate students through reading news about environmental problem faced on Lamma Island, Hong Kong and ZDR

How does Hong Kong contribute to the problem mentioned in Question 10

Preparing
to find out

- assessing what the students already know about the topic
- activating students' prior knowledge

Major
func

Name of phenomenon

Effect on global temperature

Effect on sea ice and sea level

Effect on Hong Kong

* brainstorming: generate solutions to the problem

3. Suggest what the government should be done to combat climate change.

- listing what students will try to find out in the trip
- preparing the students for the experience to follow

Questions you need to address in the field trip

1. Are there any human activities leading to climate change on Lamma Island? ↵
2. What measures have been done to combat global warming on Lamma Island? Are they effective enough? ↵
3. What other sustainable measures can be used to reduce climate change? ↵
4. What can we do to combat climate change in our daily lives? ↵

× Field trip activities with different topics

- Sequencing topics

2. Closed loop recycling

1. Rubbish

3. Eco shopping

6. Lamma Winds

4. Local farm

5. Lamma Power Station

7. Tree-planting scheme

8. Home farm

9. Mudflat

- * depend on the location of sites along the route
- * arrange similar content together
- * from important to less important topics

- Sequencing content under each topic

Example 1 Closed Loop Recycling



Gather new information about a topic through:

- observation
- briefing

Part 2 Closed loop recycling - what is it?

Visit 'Lamma Corner'.

1. Find out what three types of recyclable materials mentioned in Part 1 Question 3 are used for making the items.

Recyclable materials	Items made (Give at least one example)

2. Figure 2 shows the closed loop recycling that is practised on Lamma Island.

Figure 2

Sorting out

MANUFACTURING

PURCHASING

PRODUCT

COLLECTING

- * processing information
- * presenting information
- * drawing conclusion

The closed loop recycling involves three processes, including

(a) _____

(b) _____, and

(c) _____

3. How can this closed loop recycling help to combat climate change? ↵

construct knowledge about the way how the measure helps to combat climate change based on their prior knowledge

4. As a consumer, what roles should you play in the recycling loop to help combat climate change? ↵

help students to reflect what action they can take in the loop

Thinking
deeply

Challenge and extend students' understanding about the topic:

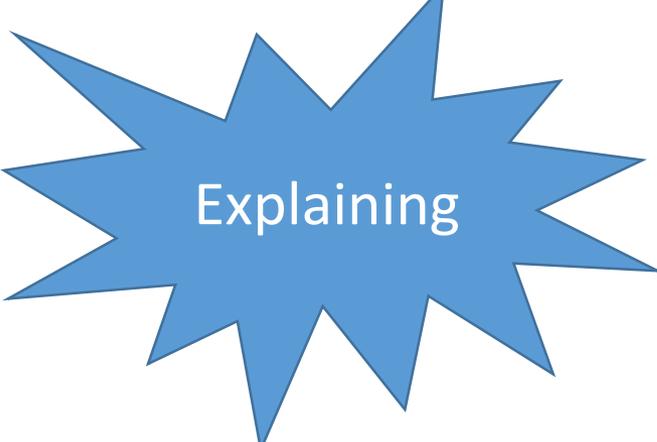
- * going further
- * raising new question
- * creating new knowledge

THINK 5. Do you think that all recyclable materials collected can enter the loop of recycling? Why?



6. (a) If the recyclable materials cannot be used for recycling, where will they go?

(b) Do you think all the recyclable materials are recycled locally in Hong Kong?



Explaining

- * expressing own opinions based on what they have learnt
- * making well-informed decision

(c) Taking into consideration of your answers in (a) and (b), do you think recycling is a good way to combat climate change? What else can we do to combat climate change?

PLAN





Action

Example 2 Lamma Winds



Gather new information about a topic through:

- reading exhibition boards
- recording real-time data
- sensing the environment

1. What types of renewable energy are used at this site?↵

2. Why is it suitable to set up the wind turbine at this site? Give five reasons.↵

-

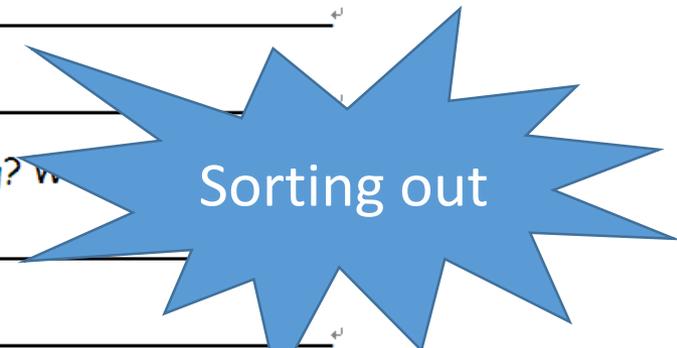
-

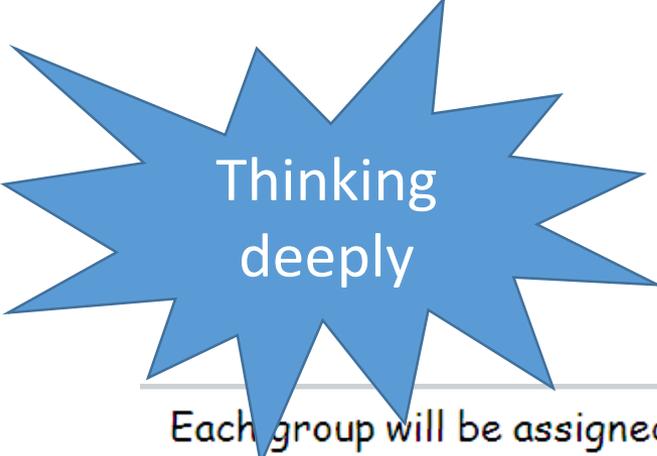
-

-

-

Is it easy to find similar site to build wind farm in Hong Kong? w





Thinking
deeply

In the role-play activity:

- * going further through reading exhibition boards
- * discussion for new task
- * creating new knowledge

Each group will be assigned one of the following roles. Collect the information from the exhibition panels for discussion.

Role	Tasks
Government	Discuss why different types of renewable energy should be further developed in relation to existing environmental problems
Spokesman from a power company	Discuss whether the development of different types of renewable energy is cost-effective
Environmentalist	Discuss the negative impact of the development of different types of renewable energy on the environment
Urban planner	Discuss the problems in the selection of suitable sites for the development of different types of renewable energy
Spokesman from Department of energy	Discuss whether different types of renewable energy can give abundant and reliable energy supply in Hong Kong and their energy efficiency

Explaining

- * expressing own opinions based on what they have learnt
- * making well-informed decision

7. Do you agree that the renewable energy should be further developed as a sustainable measure against global warming in Hong Kong? Why?

Strongly disagree Disagree Agree Strongly agree

↺	↺	↺	↺
---	---	---	---

Give at least three reasons:

THINK



8. The use of technical measures, like fuel mix and renewable energy, seems not to be the most sustainable way to combat climate change caused by power station. Then what else can we do to solve this problem?

PLAN



Action

- Post-trip activities

ACTION

<https://www.pinterest.com/pin/350717889709565712/>

- Devise personal action contracts that will be carried out at home – changing habits or forming new ones

Post-trip Activities

Name: _____ () S. _____ Date: _____

1. After the field trip, think about your living habits at your home. Write down what you have done already and what more you could do to combat climate change.

	What have you done already?	What more could you do?
Eating habits	↵ ↵ ↵ ↵ ↵	↵ ↵ ↵ ↵ ↵
Transportation	↵ ↵ ↵ ↵ ↵	↵ ↵ ↵ ↵ ↵
Use of energy	↵ ↵ ↵ ↵	↵ ↵ ↵ ↵

Students' answers

	What more could you do?	No. of students*
Eating habits	Choose organic food to eat	12
	Eat less meat / beef	7
	Eat more vegetables	5
	Eat more locally-produced food	3
	Cook/ Eat just the right amount of food to reduce waste	2
	Eat less packaged food	1
	Total	30
Transportation	Walking (short distance)	13
	Cycling	6
	Use more energy-efficient / public transport (e.g. MTR)	6
	Total	25
Use of energy	Use less electricity (e.g. air-conditioner) / use solar power	8
	Use fan instead of air-conditioner more often	5
	Use natural sunlight to save energy	4
	Turn off the electronic appliances when not in use	4
	Use LED light	2
	Use electrical appliances with electrical efficiency label	1

- Plan how to convince others to take action to cut carbon emission in school

3. Explain why 'cutting your carbon emissions together' could be seen as being like the international agreements, such as the Paris Agreement.↵

4. Do you think that this type of agreements is effective in combating climate change? Why?↵

5. What could you do to make everyone take an active part in cutting carbon emissions together? List at least three ways.↵

- Give talks to other schoolmates in the morning assembly

Considering resources and constraints

- Resources:

Student Environmental Protection Leader Training Scheme (Greengoer)

- Human resource:

Two student leaders (university students)

- * act as facilitators in the F.3's group discussion
- * explain the operation in the power station
- * help to give debriefing

- Financial resource:

A subsidy of \$2000 – buy food during eco-shopping, transportation fee and book coupons as prizes

- Constraints:

- ~ time consideration: difficulty in fitting the trip in the school calendar

- ~ less frequent ferry service at Sok Kwu Wan
→ time constraints in the trip

- ~ students' behaviour and attitudes

Can their learning motivation be sustained for a whole-day trip?

- Alternatives:
 - Focus on one of the themes:
 - * Renewable energy (whole-day trip)
 - * Low carbon lifestyle (whole-day trip)
 - Choose the sites in or near the school district
e.g. Rubbish – what’s the solution?
Eco shopping ...

Evaluation

× Content

- assess students' reaction to the programme
- assess whether the learning objectives have been met
- assess whether the knowledge and skills learned in the programme are actually applied in their daily life

× Formats

Questionnaire survey

Section A: Please tick the appropriate box.

	SA = strongly agree	A = agree	D = disagree	SD = strongly disagree
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1. The activity has enhanced my environmental knowledge and understanding of environmental problems in Hong Kong caused by carbon emissions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. This activity makes me know the application of the concept of sustainable development in taking measures against carbon emissions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The activity has enhanced my environmental awareness.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. This activity helps me make informed decisions in response to climate change.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. The activity helps me put environmental knowledge into practice in daily life (e.g. waste reduction, energy saving).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. After this activity, I would like to adopt a greener lifestyle to protect the environment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. The activity has aroused my interest in joining other environmental activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. After this activity, I am more willing to share environmental messages to my families, schoolmates and friends.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Knowledge and understanding

Application of concept of SD

Awareness

Making informed decision

Action

Section B:

Which part(s) of the field trip do you like most? Write other comments on improving activities.

Focus-group interview conducted by EDB

Questions:↵

1. Have you participated in any services or activities related to environmental protection inside or outside your school? Can you share your experiences? Why are you interested in conserving the environment?↵
2. Can this field trip meet your expectations? What is your greatest benefit from this field trip? Can you share with me?↵
3. Among the environmental problems mentioned in the field trip, which one needs to be addressed urgently? Compare to the place you live, what are their similarities or differences?↵
4. Referring to your suggestions to the government you made before the field trip, would you like to make any revision or amendments so that relevant measures can combat climate change more effectively?↵
5. How would you choose between economic development and environmental conservation?↵
6. How would you apply the concepts of low carbon living in your daily life? Do you think that you can sustain such a lifestyle?↵

Stages involved in conducting field trip

- Logistics planning
 - Apply for administrative approval
 - Book briefing session and workshops organized by Lamma Corner or guided tours organized by HK Electric if necessary
 - Check whether Lamma Winds is open to the public on the day for field trip
 - Check the schedule of ferry service (may reserve the seats in advance if there is a large group of participants)
 - Make arrangement for meals and develop schedule for the day

- Arrange special equipment like cameras or tablets and collect money
- Inform the police about the trip
- Inform parents about the trip
- Print worksheets
- Create a list of student names and phone number for emergency

- Briefing session / Field trip preparation
 - Show photograph of the site – Lamma Winds
 - Show photograph of glacial retreat

- Discuss the purpose of the field trip
- Overview the rundown of the field trip
- Tell the format: group competition
- Set action targets and discuss money usage, lunch plans, dress code and other necessary items.

Action Targets

- Active
- Attention
- Learning
- Be safe – Not allow to sit outdoors in the ferry and play with water on the beach
- Be punctual
- Responsible
- Good behaviour

× Field trip

- Do things that are planned.
- Provide background information of the site
- Introduce the task at each site
- Provide time for students to observe, collect and record information, and discuss
- Ask prepared questions and check the answers.
- Debriefing at each site

.

Evaluation - Results

SA = strongly agree A = agree D = disagree SD = strongly disagree

	SA	A	D	SD
1. The activity has enhanced my environmental knowledge and understanding of environmental problems in Hong Kong caused by carbon emissions.	13%	87%	0%	0%
2. This activity makes me know the application of the concept of sustainable development in taking measures against carbon emissions.	17%	83%	0%	0%
3. The activity has enhanced my environmental awareness.	35%	65%	0%	0%
4. This activity helps me make informed decisions in response to climate change.	35%	65%	0%	0%
5. The activity helps me put environmental knowledge into practice in daily life (e.g. waste reduction, energy saving).	17%	83%	0%	0%
6. After this activity, I would like to adopt a greener lifestyle to protect the environment.	22%	69%	9%	0%
7. The activity has aroused my interest in joining other environmental activities.	31%	65%	4%	0%
8. After this activity, I am more willing to share environmental messages to my families, schoolmates and friends.	17%	74%	9%	0%

Knowledge and understanding

Application of concept of SD

Awareness

Making informed decision

Action

Bar chart showing the frequency count of favourite site / activity

