Senior Secondary Liberal Studies
Learning and Teaching Exemplar
for NCS students (5)

Understanding Municipal Solid Waste Management in Hong Kong

Understanding Municipal Solid Waste Management in Hong Kong

A. Basic information of the lessons

Topic Understanding the municipal solid waste management in Hong Kong

Relevant modules, themes and issues for enquiry

Leading Module 6: Energy Technology and the Environment;

Theme 2: Environment and Sustainable Development

- How do science and technology match with sustainable development? What are the constraints?
- How do the living styles of people and social development affect the environment and the use of energy?
- What responses could be made by different sectors of society, governments and international organisations regarding the future of sustainable development?

Related Module 2: Hong Kong Today;

Theme 1: Quality of Life

- Which aspects of the quality of life are seen to be more important? Which are seen to be immediate needs? Who might make the decisions? Why?
- What are the different opinions of Hong Kong residents on the priorities which constitute the quality of life?
- How can individuals or organisations contribute to the maintenance and improvement of the quality of life? What are the obstacles to their efforts? Which groups of people are most affected if these obstacles are not removed?

Overall design rationale

The lessons start from introducing the solid waste disposal in different places (India, Pakistan, Bangladesh and Hong Kong). Both NCS and local Chinese students may learn about the solid waste issue in the context of Hong Kong as well as in other cities and understand that different countries face similar problems and challenges.

Students first identify the solid waste problems in Hong Kong. Teachers briefly explain the reasons for the emergence of solid waste problems in Hong Kong, namely over-consumption, low environmental awareness of citizens, ineffective measures of solid waste

management, etc. Teachers would introduce the multi-tiered waste management hierarchy and discuss with students about the measures/ policies that may help alleviate the solid waste problems. Students will discuss the effectiveness of the solid waste management measures adopted in Hong Kong.

In this teaching package, the implementation of solid waste management measures to alleviate the solid waste problems will be evaluated. Teachers may focus on one or more specific methods (for example, landfilling, incineration, recycling and solid waste charging) with reference to the framework of discussion. During the discussion, teachers may focus on contextualization and evaluation of the effectiveness of the measures with reference to the framework suggested.

Time required

4 lessons (40 minutes per lesson), approximately 160 minutes in total

Learning objectives

Knowledge:

- To understand the current situation of municipal solid waste in Hong Kong.
- To understand the concepts related to sustainable development and the interrelationship between human activities and the natural environment.
- To understand how the Hong Kong Government responds to the issue of municipal solid waste.
- To evaluate the effectiveness of different solid waste management measures adopted in Hong Kong.

Skills:

- To develop skills in identifying features of solid waste, decoding cartoons and evaluating the effectiveness of different solid waste management measures.
- To apply relevant knowledge and concepts in discussing contemporary issues.
- To analyse issue from critical multiple perspectives and develop skills of conceptualization and contextualization.
- To express ideas in speaking and writing.

Values and attitudes:

- To increase the awareness on environmental protection.
- To be aware of civil rights and obligations, and to participate and collaborate in community affairs.
- To care about and protect living things, natural environment and the wellbeing of humankind.

Basic Concepts for application

Basic concepts:

sustainable development, polluter pays principle, solid waste management, green lifestyle, quality of life

Related concepts:

intergeneration equity, harmony and balance, waste recovery, source reduction, over-consumption, environmental awareness, waste hierarchy, economic (dis)incentive, deterrent effect

Relevant learning experience at junior secondary levels

- To have a general idea about the significance of sustainable development.
- To have acquired a basic understanding of different aspects of quality of life (material, non-material, political, social, economic, cultural and environment).
- To have acquired a basic understanding of the role of individuals in environmental protection.

Catering the learning needs of NCS students

- The lesson will start from the solid waste problems in different countries which may arouse the interest of NCS students in exploring the situation in different places in the world.
- The use of audio-visual learning materials may enhance the motivation of students in learning Liberal Studies.
- Guiding questions are set after each source in the data file. The questions guide the students to process the data and generalise the implication step by step. The questions could be used for lesson preparation or in-class discussion. Students are able to build up knowledge with the support of simple sequential tasks.

B. Design of classroom learning and teaching

Lesson Learning and teaching strategies and flow

Before class

Lesson preparation

Ask students to study the photos and watch the video about the solid waste problems in India, Pakistan and Bangladesh **(Appendix 1)**. This would facilitate the discussion and learning activities in the coming lessons.

1 Focus: Understanding the solid waste problems in Hong Kong

Lead in (around 15 minutes)

- Go over the pre-lesson preparation worksheet with students. The focus will be on the solid waste problems in Pakistan, Bangladesh and India.
- Remind students that solid waste problems are found in different places.

Pair-work/ group work (around 20 minutes)

- Ask students to read **Appendix 2** and identify the features of solid waste in Hong Kong.
- While studying the statistics about solid waste in Hong Kong, teachers can ask the following questions to guide students: **(Sources A to B)**.
  a. What solid waste management measure is adopted in Hong Kong?
  b. What are the types of solid wastes disposed in landfill?
  c. What was the overall difference in the quantities of solid waste disposed at landfills in 1991 and 2016?
- Ask students to discuss the solid waste problems in Hong Kong. Teachers may help students clarify and conceptualize their answers.

  - ★ Types of solid wastes disposed in landfill: Domestic waste, commercial waste, industrial waste, construction waste, special waste.
  - ★ Changes of solid wastes disposed: The quantities of solid waste disposed at landfills decreased from 1991 to 2016.

Round up (around 5 minutes)

- To revise the types of solid waste in Hong Kong.
- To revise the features of solid waste problems in Hong Kong.

2 Focus: Analysis of the causes of municipal solid waste (MSW)

Lead in (around 10 minutes)

- Ask students to recall the waste they disposed of on the day before the lesson.
- Teachers can bring a bag of waste and ask students to reflect whether it was necessary to dispose of it.
- Ask students to reflect why there is a huge amount of waste in the society.

Group Discussion (around 25 minutes)

- Ask students to identify the *causes* of solid waste problem with reference to the cartoons provided **(Appendix 3)**.
- Before working in groups, teachers can briefly introduce the cartoon decoding skills
- Ask students to interpret the message of the cartoons **(Appendix 3 - Cartoons A to C)**
- Teachers can highlight the relevant concepts (e.g. environmental awareness, social responsibilities, over-consumption, and effectiveness of solid waste management measures) and ask students to apply the concepts in the discussion.
- The discussion should elaborate the causal relationship between the relevant concepts and solid waste problems. Students are expected to justify their answers in view of the situation in Hong Kong.

Round up (around 5 minutes)

- To revise the causes of solid waste problems.
- To revise the relationship between the relevant concepts and solid waste problems.

3&4 Focus: Analysis of the effectiveness of solid waste management measures

Part A: Analysis of the effectiveness of solid waste management measures at school Group Discussion (around 20 minutes) (Appendix 4)

- Ask students to identify the solid waste management measures adopted at school. (If possible, teachers can ask students to walk and observe around the school campus for analyzing the related measures.)

- Ask students to discuss the effectiveness of the measures.
- During the discussion, teachers can remind students to apply the concepts discussed in the previous lessons and introduce some useful criteria (e.g. feasibility, accessibility, coverage, short/long term impact, reliability, etc.) for evaluating the effectiveness of the measures.
- Conclude that each solid waste management measure may have its advantages and challenges in alleviating the solid waste problems at school.
- Ask students to walk and observe in the community for analyzing solid waste management measures.

Part B: Analysis of the effectiveness of solid waste management measures in Hong Kong Pair work / Group discussion (around 30 minutes)

- Ask students to read the sources and watch the video about the solid waste management measures adopted in Hong Kong. **(Appendix 5 - Source A to D)**
- Ask students to discuss the effectiveness of the measures.
- Teachers can help students clarify and elaborate their answers with reference to the sources given. Teachers and students could make use of **Appendix 5** to organise their ideas. Samples can be shown as examples with reference to the ability of students.
- Teachers could pick other solid waste management measures adopt in Hong Kong for discussion. (e.g. Plastic Bag Levy, Waste charging, etc.) (Appendix 6)

Summary / Conclusion (10 minutes)

Teachers conclude the effectiveness of solid waste management measures and revise the skills acquired in evaluating the effectiveness of different policies.

Post-discussion assignment (around 20 minutes)

- Brief students about the post-discussion assignment for the consolidation of learning in previous lessons. Assign a data-response question **(Appendix 7)** with reference to the learning objective and ability of students. A framework could be provided for students of weaker ability. Guided writing could be arranged if necessary.
- Share students' work (both good and weak samples) and give constructive feedback to students.

Appendix 1: Pre-lesson task

What is the situation of solid waste management in India?

SOURCE A Photographs taken in India, Pakistan and Bangladesh

Due to copyright issues,
please search
the cartoon from the website below.

Photo 1

Source: Financial Express (2017) Managing India's municipal solid waste). Retrieved from http://www.financialexpress.com/opinion/managing-indias-municipal-solid-waste-using-incentives-and-penalty/693749/

Photo 2

Source: Green India Drive (2017) Waste Management. Retrieved from https://greenindiadrive.wordpress.com/waste-management/

Photo 3

Source: Bioenergy Consult (2016) Retrieved from https://www.bioenergyconsult.com/solid-waste-management-in-pakistan

Due to copyright issues,
please search
the cartoon from the website below.

Photo 4

(A woman dries plastic bags for recycling on the banks of the Buriganga River in Dhaka, Bangladesh.)
Source: green page. Retrieved from http://greenpagebd.net/waste-in-bangladesh/#.Wo-ajyVubct

SOURCE B Solid Waste in India

Waste management: India's need of the hour
https://www.youtube.com/watch?v=7KyLHrxYtc4

Guiding Question: *What is the solid waste problem in India?*

Answer the following questions after watching the video.

1. Decide whether the following statements are true. If not, correct the italic term in the space provided.

statement	T/F?	Correction
a. Nearly ***3.65 million tonnes*** of municipal solid waste is generated in India annually.		
b. Out of the total municipal waste collected, ***94% is dumped*** on land and 5% is composed.		
c. Urban India is the ***1st largest*** garbage generator.		
d. People used to dump garbage ***at the end of the lane***.		

2. Fill in the blanks.

a. Garbage will be transported to _____ in the city.

b. People who work in the landfills have a higher risk to suffer from _____ due to the poisonous gases released in the landfill sites.

c. Domestic wastes, _____ wastes, _____ wastes, plastic wastes are dumped together into the landfills.

d. Air, _____ and _____ pollutions are brought about from the solid waste management in India.

Appendix 2: Class activity

Situation of solid waste management in Hong Kong

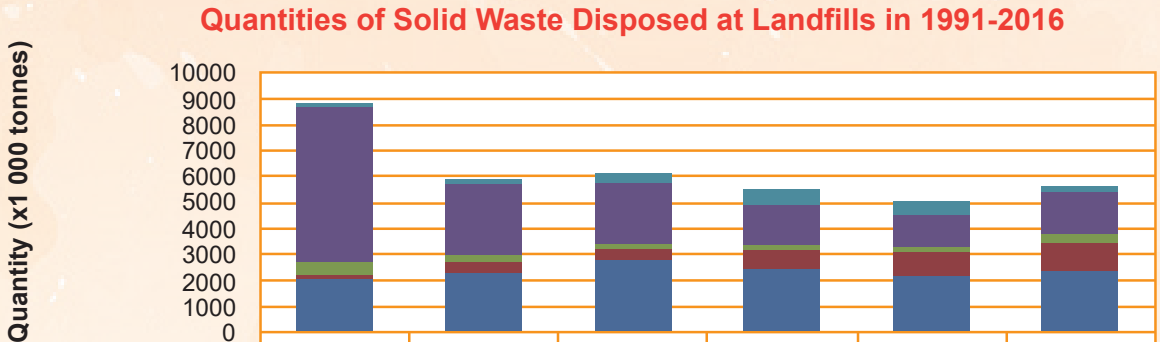
Focus: Identify the ***features*** of solid waste management in Hong Kong.

Language corner - 'features'

Some hints for analysis:

- start with vertical analysis (compare the highest and lowest figures in a particular year) and horizontal analysis (point out the trend or characteristics across all years);
- highlight all possible features (trend, (significant) changes, pattern, highest & lowest points / items, differences among groups, etc.);
- support the descriptions with data evidence.

SOURCE A **Quantities of Solid Waste Disposed at Landfills in 1991-2016**



Year	1991	1996	2001	2006	2011	2016
Total	8800	7900	6140	5490	4912	5612
Special waste	120	180	400	600	413	207
Construction waste	5980	2750	2340	1510	1216	1619
Industrial waste	520	290	210	210	242	339
Commercial waste	150	400	430	750	861	1108
Domestic waste	2030	2280	2760	2420	2180	2339

Source: Environmental Protection Department

1. According to Source A,
   a. what solid waste management measure is adopted in Hong Kong?

   _____

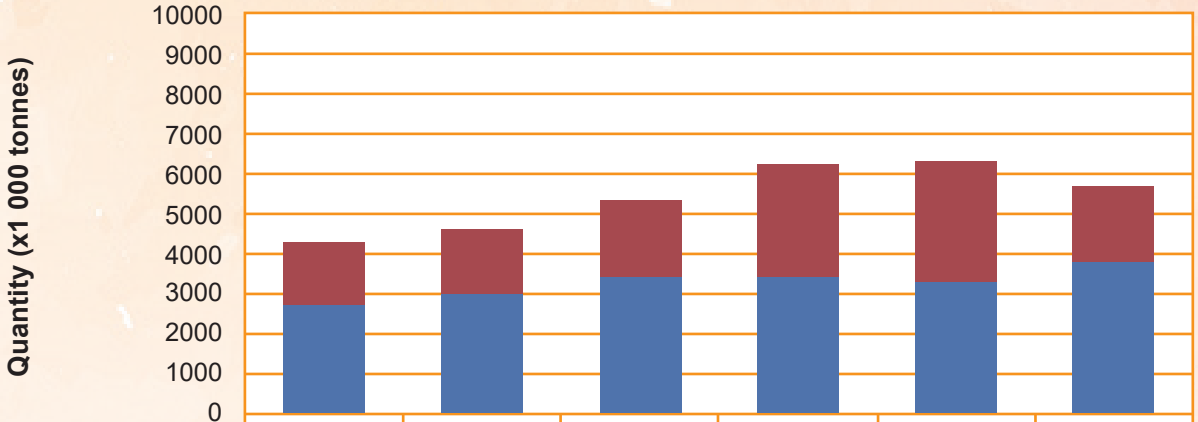
   b. what are the types of solid wastes disposed in landfill?

   _____

c. what was the overall difference in the quantities of solid waste disposed at landfills in 1991 and 2016?

SOURCE B Quantity of Municipal Solid Waste Disposed of and Recovered in 1991-2016

Quantities of Solid Waste Disposed of and Recovered in 1991-2016



Year	1991	1996	2001	2006	2011	2016
Total	4260	4610	5333	6228	6302	5698
MSW Recovered	1560	1640	1938	2841	3019	1912
MSW Disposed of	2700	2970	3395	3387	3283	3786

Source: Environmental Protection Department. Retrieved from http://www.epd.gov.hk/epd/english/environmentinhk/waste/data/stat_treat.html

2. According to Source B, what was the feature of the Solid Waste Management? (hints: highlight the solid waste management, changes, compare the differences between groups)

Appendix 3: Class activity

Focus: Identify the ***causes*** of the solid waste problems.

Language corner - Cartoon Decoding

Steps:

1. **Identify and describe the clues**
   - Objects / characters
   - Actions / facial expression/ clothing
   - Dialogue/ wordings
   - Background (if necessary)
2. **Interpret those clues**
   - It represents/shows/reflects/implies…
   - e.g. the character represents… which group of people
3. **Interpret the overall message**

Questions: What are the messages conveyed in the cartoon A and B?

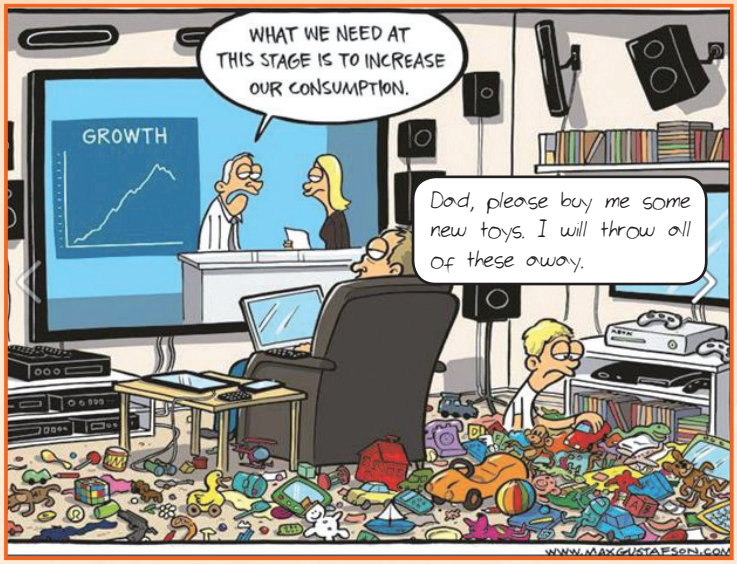
Cartoon A

Due to copyright issues, please search the cartoon from the website below.

Source: Expand the Winnebago County Landfill? Why Bother? Retrieved from http://storycartoons.com/blog6/tag/landfill/

Clues in the cartoon	Implication
Message of the cartoon	

Cartoon B



Source: Kipper Williams (2013). Retrieved from https://zerowasteeurope.eu/2013/12/zero-waste-christmas-rethinking-consumption/

Clues in the cartoon	Implication
Message of the cartoon	

Cartoon C

Due to copyright issues, please search the cartoon from the website below.

Source: http://wkuherald.com/opinion/editorial-few-students-recycle-even-with-opportunities/article_3fa0937c-6bb8-11e5-920e-4b94f3dd83c5.html

Clues in the cartoon	Implication
Message of the cartoon	

Appendix 4: Class Discussion - Solid Waste management at school

1. What measures does the school adopt to tackle solid waste problems? Are the measures effective in alleviating the solid waste problems at school?

	Measure (What is the measure about?)	**Description** (How is the measure adopted at school?)	**Evaluation** (Can the measure help reduce the solid waste at school? Criteria for evaluation: effectiveness, feasibility, accessibility, coverage, short/long term impact, reliability, etc.)
1.	(Example) Recycling	(Example) Paper recycling bin are placed on each floor.	(Example) Can teachers, students and janitors access / see the bins easily? Do students put papers into the bin? Do students make good use of the recycle bin?
2.			
3.			
4.			

2. Writing task

Does the school adopt effective solid waste management measures to tackle solid waste problem?

Suggested framework for writing task

Topic Sentence

In terms of _____ (Criteria) _____ ,
_____ (measure) _____ is / is not an effective solid waste management measure at school.

Elaboration

1. What is the measure about? 2. How is it adopted?

Evaluation

Refer to the criteria highlighted in the topic sentencce and evaluate the effectiveness of the measure

Conclusion

Concluding statement

(Example)

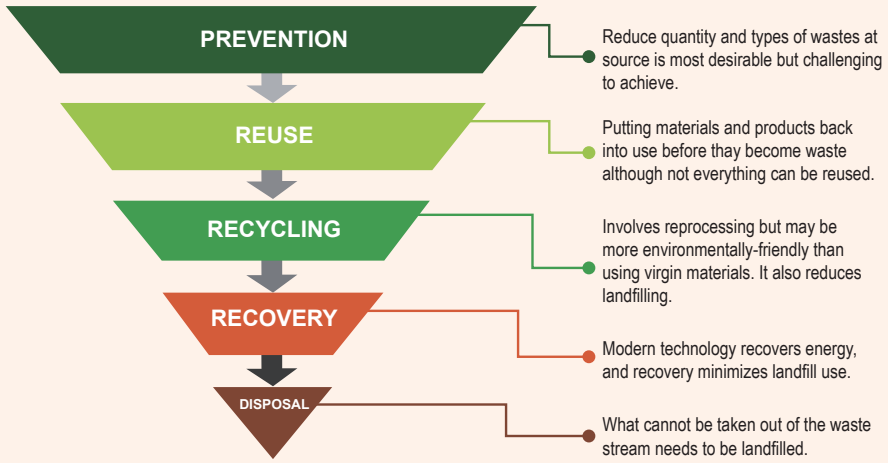
In terms of ***accessibility, placing recycling bins on each floor*** is not an effective solid waste management measure at school.

At school, one paper-recycling and one can-recycling bin are placed at the end of the corridor on each floor. Though recycling bins are placed, the accessibility of these bins are low. Teachers, students and janitors seldom go to the end of the corridor. Besides, limited amount of papers and cans are found in the recycling bins.

Therefore, ***placing recycling bins on each floor*** is not an effective solid waste management measure at school.

Appendix 5: Solid Waste management in Hong Kong

The Hong Kong Government established the "Policy Framework for the Management of Municipal Solid Waste (2005-2014)" in 2005 and issued the "Hong Kong: Blueprint for Sustainable Use of Resources (2013-2022)" in 2013, systematically coping with solid waste problem.



The EU also introduces a five-step waste hierarchy where ***prevention is the best option***, followed by re-use, recycling and other forms of recovery, with disposal such as landfill as the last resort. EU waste legislation aims to move waste management up the waste hierarchy.

Source:"HONG KONG BLUEPRINT FOR SUSTAINABLE USE OF RESOURCES 2013-2022". The web page of Environment Bureau (May 2013).

SOURCE B Main strategies of solid waste management in Hong Kong

Methods	Measures
Waste reduction at source	● Government regulation such as 'Waste Disposal Ordinance', 'Waste Reduction Framework Plan' and 'Product Eco-responsibility Ordinance'. ● Public education and the 'Wastewise Scheme' in collaboration with the commercial sector ● Provide economic incentives, such as Producer Responsibility Scheme (RPS) and waste levy
Waste recycling	● Cooperate with Mainland enterprises to promote recycling import and export products ● Promote recycle and reuse, such as constructing Ecopark ● Launch the 'Rechargeable Battery Recycling Programme' and the 'Waste Electrical Equipment Recycling Programme' ● Promote source separation of domestic, commercial and industrial waste ● Develop organic waste treatment facilities
Incineration	● Construct integrated waste management facilities with advanced incineration technology
Landfill	● Expand the South East New Territories Landfill

Source: Environmental Campaign Committee (2016) Hong Kong: A Sustainable Future Liberal Studies Teaching Kit. Retrieved from www.eccteachingkit.org.hk

SOURCE C

Building incinerators at landfills - a better solution for Hong Kong's waste

Waste is a problem that will not go away; indeed, the world will produce more and more as prosperity levels continue to rise. Hong Kong is no exception, and the present method of dealing with municipal solid waste, namely by dumping it in landfills, will no longer work in the near future.

Hong Kong's three landfills, in the New Territories, are nearing their maximum capacity and will be full in 2015, 2017 and 2019 respectively. The administration recognises this, and is on the right track in its multipronged approach to educate the community, change people's behaviour and invest in infrastructure.

The government is proposing to extend the capacity of the three landfills while also building an integrated waste management facility, which would reduce the volume of waste as well as produce electricity during the incineration process. Thanks to advances in technology, these facilities have state-of-the-art pollution and odour control equipment, preventing harmful emissions from being released. The government proposes that the single facility be built on an artificial island near Shek Kwu Chau.

Landfills do pose significant environmental risks, including the leaching of toxic chemicals into the groundwater and the release of methane emissions from decomposing trash. Therefore, these extensions need to be temporary bridging solutions.

In the Netherlands, landfilling is only used for 2% of the waste, with recycling (60%) and waste-to-energy (38%) used for the rest. Hong Kong must aim to reduce the landfills significantly through a combination of recycling and waste-to-energy facilities.

Source: South China Morning Post (2014) Building incinerators at landfills - a better solution for Hong Kong's waste Retrieved from http://www.scmp.com/comment/insight-opinion/article/1457563/building-incinerators-landfills-better-solution-hong-kongs

SOURCE D Straight to landfill? Why Hong Kong is recycling less of your rubbish

For years, Christina Jang has been conscientiously sorting the plastic bottles, aluminium cans and recyclable paper from her rubbish and placing them in the appropriate bins for recycling. But last summer, a cleaning lady in her building opened her eyes to what really happened to the materials that were supposed to be recycled.

"While she was collecting from the bin, I happened to take the recycling down and I asked her how I should sort my trash. She said you don't need to do any sorting because it all goes in the trash anyway," Jang says. "I was very angry because I had been sorting my trash, thinking that we were recycling everything and now you're telling me it's all a sham."

Despite the discouraging response, Jang, a career coach and environmental consultant in her 40s, continues to separate her rubbish. "I realised that it'll be worse if I don't sort my trash. I believe that consumers' voices do matter because if we don't do it, then no one will."

There have long been complaints about cleaners mixing trash and recyclable materials, all of which ends up in landfills: in 2013 the SCMP filmed government contract workers doing just that in Causeway Bay and Wan Chai, and residents have regularly reported similar incidents with rubbish disposal.

That is why, since last year, government contractors have been required to use clearly labelled plastic bags for recyclable materials so everyone can keep an eye on them, says Wong Hon-meng, an assistant director at the Environmental Protection Department.

But both the recycling sector and environment officials acknowledge the problem goes beyond cleaners not handling trash properly: it's hard to make money from recycling materials and the costs of sorting and transporting recyclables can far exceed what companies earn from selling the materials.

Source: South China Morning Post (2015) Straight to landfill? Why Hong Kong is recycling less of your rubbish Retrieved from http://www.scmp.com/lifestyle/article/1859106/why-hong-kong-recycling-less-its-rubbish-time-goes

SOURCE E Food Wise Scheme

400 eateries join Food Wise scheme
https://www.youtube.com/watch?v=LyIcJiG6tAY

Guiding Question: *What is the Food Wise scheme about?*
Can it help reduce food waste effectively?

With reference to the above sources, evaluate the effectiveness of the solid waste management measures adopted in Hong Kong.

	Measure (What is the measure about?)	**Description** (How is the measure adopted at school?)	**Evaluation** (Can the measure help reduce the solid waste at school? Criteria for evaluation: effectiveness, feasibility, accessibility, coverage, short/long term impact, reliability, etc.)
1.	Landfill		
2.	Incineration		
3.	Waste recycling		
4.	Waste reduction at source (e.g. Food Wise Campaign)		

Writing task

Does Hong Kong adopt effective solid waste management measures to tackle solid waste problems?

Suggested framework for writing task

Topic Sentence
In terms of _____ (Criteria) _____ ,
_____ (measure) _____ is / is not an effective solid waste management measure in Hong Kong.

Elaboration
1. What is the measure about? 2. How is it adopted?

Evaluation
Refer to the criteria highlighted in the topic sentencce and evaluate the effectiveness of the measure.

Conclusion
Conluding statement

Try writing one of the argument!

(Example)

In terms of ***(criteria), (solid waste management measure)*** is /is not an effective solid waste management measure in Hong Kong.

- What is the measure about? How is it adopted?
- Refer to the criteria highlighted in the topic sentence and evaluate the effectiveness of the measure

Therefore, ***(solid waste management measure)*** is / is not an effective solid waste management measure in Hong Kong.

Appendix 6: Solid Waste management in Hong Kong

Some examples of policies/ facilities related waste management

Some examples of policies/ facilities related waste management		
policies	**Brief description**	
Plastic Bag Levy	• Ban on free Plastic shopping bags (PSB) distribution at all points of retail sales • Except with exemptions, retailers should charge at least 50 cents for each PSB provided to consumers • Retention of the PSB charges by sellers	*"pay-as-you-throw" / "polluter-pay principle"* ➔ *Provide financial disincentive for polluters*
Construction waste disposal charging scheme	• Construction waste producers, prior to using government waste disposal facilities, need to open a billing account with the Environmental Protection Department and pay for the construction waste disposal charge. • Through the Charging Scheme, construction waste producers are encouraged to reduce, sort and recycle construction waste so that their disposal costs can be minimised and our valuable landfill space can be preserved.	
Waste charging *(under discussion)*	• Opinion gained from a consultation showed that public tend to support the introduction of quantity-based MSW charging as a policy tool to promote waste reduction and recovery • But views were fairly mixed when it came to the implementation details, including concerns about fly-tipping and other compliance and environmental hygiene issues.	
Integrated Waste Management Facilities *(under construction)*	• The first one will be set up at Shek Ku Chau • It composes of 1) mechanical sorting and recycling facility, 2) waste heat recovery and power generation system, 3) environmental education centre and 4) advanced incineration facility • The IWMF aims to substantially reduce the bulk size of mixed MSW by 90% and to recover useful resources. It will minimize the landfilling of waste significantly, thereby extending the useable life of landfills and their extensions in Hong Kong.	
Organic waste treatment facilities (OWTFs) *(under construction)*	• The OWTF aims to recycle source-separated organic waste generated from the C&I sectors (mostly food waste) to useful products, thereby minimizing requirement for landfill disposal. • The OWTF would adopt biological technologies to stabilize the organic waste and turn it to useful compost products and biogas for energy recovery • There is a pilot composting plant in Kowloon Bay	
Sludge treatment facility	• The plant primarily collects sludge generated from the Stonecutters Island Sewage Treatment Works and ten other wastewater treatment facilities located in Hong Kong. It will incinerate the sludge, thus alleviating the continuing sewage sludge disposal problem • It is located at Tsang Tsui, Tuen Mun.	

Appendix 7: Post-discussion assignments (Data-response question)

Consider the following information.

SOURCE A Quantity of Food Waste in Hong Kong (2002-2014)

Year	Food Waste		
	Domestic Waste	Commercial and Industrial (C&I) Waste	Total
2002	2782	373	3155
2006	2473	727	3200
2010	2397	840	3237
2014	2608	1033	3641

Unit : tones per day (tpd) Source : Monitoring Solid Waste in Hong Kong (Waste statistics)

SOURCE B Reducing food waste is everyone's concern

Every day some 3,350 tons of food waste is dumped in the landfills of Hong Kong, according to figures provided by the Environmental Protection Department. The figures, which cover the year 2015, mean food waste makes up an incredible 33 percent of our municipal solid waste.

So what can we do to reduce the amount of food waste sent to landfill? Well, we could start by looking at what have done in Taiwan, where the government introduced an island-wide mandatory waste-separation program in 2006. The program, which requires the public to sort their garbage into recyclables, food waste and residual waste, includes a fine of NT$1,200 ($40, or just over HK$300) for anyone who fails to separate their waste correctly following an initial warning. Around three-fourths of the food waste collected is sold to pig farms, with nearly all the rest composted.

Now, obviously Hong Kong is not Taiwan, and what worked there may not work well here. For one thing Hong Kong has fewer than 100,000 pigs, compared with a swine population of 5.5 million in Taiwan. It also lacks a large-scale composting plant, although a 200-ton-a-day organic-waste treatment facility (OWTF) is due to be commissioned on Lantau Island later this year. Any long-term solution to the problem of food waste in Hong Kong, therefore, needs to focus on reducing waste at source.

The government clearly realizes this. In 2014 the Environment Bureau (ENB) issued "A Food Waste and Yard Waste Plan for Hong Kong 2014-2022", which set a target of reducing food-waste disposal to landfill by 40 percent by 2022, with reduction at source identified as the key strategy. However, even if the Environment Bureau (ENB) succeeds in meeting its target, it will still have some 1,500 tons a day of food waste on its hands, even after the commissioning of a second, 300-ton-a-day OWTF in Sha Ling in 2021.

Source: China Daily (2017) Reducing food waste is everyone's concern. Retrieved from http://www.chinadaily.com.cn/hkedition/2017-08/22/content_30940047.htm

a) According to Source A, identify and explain the features of food waste in Hong Kong. (4 marks)

b) With reference to the sources, to what extent do you agree that the food waste reduction programme could effectively solve the problem of food waste in Hong Kong? (8 marks)

Suggested Guidelines

a. According to Source A, identify and explain the features of food waste in Hong Kong. (4 marks)

Guidelines:

Read the source carefully and complete the table below.

	Guiding questions	Evidence in Source A
1.	Size of the food waste? (getting much/less)	
2.	Composition of the food waste? (proportion of domestic waste/C&I waste?)	

Remarks:

1. Identify the features (include all three features)

2. Give evidence (cite data from the source)

b. With reference to the sources, to what extent do you agree that the food waste reduction programme could effectively solve the problem of food waste in Hong Kong? (8 marks)

Guidelines:

Step 1: What is the problem of food waste in Hong Kong?

Step 2: What is the food waste reduction programme about?

Step 3: What factors affecting the effectiveness of the programme in Hong Kong?

Step 4: Determine whether the programme could effectively solve the problem of food waste.

Suggested structure of each argument:

1. **Topic sentence:** In terms of ____(Criteria)____, the food waste reduction programme could (not) effectively solve the problem of food waste in Hong Kong.
2. **Elaboration:**
   a. What is the measure about?
   b. How is it adopted?
   c. Refer to the criteria highlighted in the topic sentence and evaluate the effectiveness of the measure.
3. **Mini-conclusion**

a. According to Source A, identify and explain the features of food waste in Hong Kong. (4 marks)

b. With reference to the sources, to what extent do you agree that the food waste reduction programme could effectively solve the problem of food waste in Hong Kong? (8 marks)

-- End of Appendix --

(P.119)

1. Decide whether the following statements are true. If not, correct the italic term in the space provided.

statement	T/F?	Correction
a. Nearly ***3.65 million tonnes*** of municipal solid waste is generated in India annually.	F	36.5 million tonnes
b. Out of the total municipal waste collected, ***94% is dumped*** on land and 5% is composed.	T	
c. Urban India is the ***1st largest*** garbage generator.	F	3rd largest
d. People used to dump garbage ***at the end of the lane***.	T	

2. Fill in the blanks.

a. Garbage will be transported to landfills in the city.
b. People who work in the landfills have a higher risk to suffer from tuberculosis due to the poisonous gases released in the landfill sites.
c. Domestic wastes, medical wastes, construction wastes, plastic wastes are dumped together into the landfills.
d. Air, water and land pollutions are brought about from the solid waste management in India.

(P.120&121)

1. According to Source A,

d. what solid waste management measure is adopted in Hong Kong?

Landfilling

e. what are the types of solid wastes disposed in landfill?

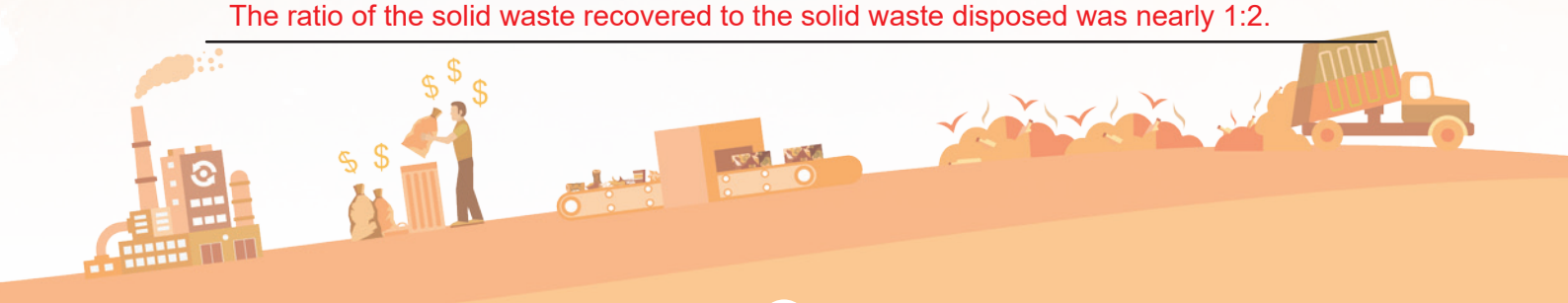
Domestic waste, commercial waste, industrial waste, construction waste, special waste

f. what was the overall difference in the quantities of solid waste disposed at landfills in 1991 and 2016?

The quantities of Solid Waste Disposed at Landfills decreased from 8 800 000 tonnes in 1991 to 5 612 000 tonnes in 2016.

2. According to Source B, what was the feature of the Solid Waste Management?
(hints: highlight the solid waste management, changes, compare the differences between groups)

Quantity of Municipal Solid Waste Disposed of and Recovered were shown in Source B.
In general, the total quantity of Municipal Solid Waste disposed of and Recovered increased slightly from 4 260 000 tonnes in 1991 to 5 698 000 tonnes in 2016.
The ratio of the solid waste recovered to the solid waste disposed was nearly 1:2.



(P.122) Questions: What are the messages conveyed in the cartoon A and B?

Clues in the cartoon	Implication
(background) There were lots of wastes on the street or park (can, paper cup, cigarettes, etc.)	People litter on the street. (behavior)
A man is reading a newspaper headlines 'Landfill expansion' and he was thinking about 'Why bother?'	The man doesn't care about the expansion of the landfill. (attitude)
Message of the cartoon There were lots of wastes in the society because of the low environmental awareness of people in the society.	

Clues in the cartoon	Implication
(businessmen) In the TV program, a man, who represents businessmen, concerns about consumption and profit maximization.	Businessmen concern about profit-maximization and thus they would keep producing different products to attract consumption.
In the house, there are lots of toys on the floor. The little boy asked his dad to buy him some new toys and he would throw all his old toys. There are also too many electronic appliances and AV products at home.	Over-consumption is shown. People keep purchasing new stuffs and throw away the old ones.
Message of the cartoon People tend to throw away their belongings. Lots of solid wastes are produced due to the over-production and over-consumption of businessmen and consumers.	

Clues in the cartoon	Implication
Citizens think: - recycling bin makes the trash inconvenient - the recycling bins and the trash look so similar The Earth: 'Just kill me already!'	People are not familiarized with/ would not take priority in recycling. People don't aware their behaviors are hurting the environment (the Earth).
Message of the cartoon Placing recycling bin is not an effective way to reduce waste as people still throw most of the rubbish (including those can or cannot be recycled) into the trash.	

3. Writing task

Does the school adopt effective solid waste management measures to tackle solid waste problem?

Suggested framework for writing task

Topic Sentence

In terms of _____ (Criteria) _____ , _____ (measure) _____ is / is not an effective solid waste management measure at school.

Elaboration

1. What is the measure about? 2. How is it adopted?

Evaluation

Refer to the criteria highlighted in the topic sentencce and evaluate the effectiveness of the measure

Conclusion

Conluding statement

(Example)

In terms of ***accessibility, placing recycling bins on each floor*** is not an effective solid waste management measure at school.

At school, one paper-recycling and one can-recycling bin are placed at the end of the corridor on each floor. Though recycling bins are placed, the accessibility of these bins are low. Teachers, students and janitors seldom go to the end of the corridor. Besides, limited amount of papers and cans are found in the recycling bins.

Therefore, ***placing recycling bins on each floor*** is not an effective solid waste management measure at school.

(P.130)

With reference to the above sources, evaluate the effectiveness of the solid waste management measures adopted in Hong Kong.

	Measure (What is the measure about?)	**Description** (How is the measure adopted at school?)	**Evaluation** (Can the measure help reduce the solid waste at school? Criteria for evaluation: effectiveness, feasibility, accessibility, coverage, short/long term impact, reliability, etc.)
1.	Landfill	Most municipal solid waste are dumped in three landfills in Hong Kong.	effectiveness/sustainability – all landfills will reach their maximum capacity in 2015, 2017 and 2019 respectively. Short / long term impact – landfill disposal can help relieve the solid waste problem in the short term, but not a long-term solution
2.	Incineration	Construct integrated waste management facilities with advanced incineration technology	Effectiveness – incineration can help reduce the volume of solid waste dump in the landfills, produce less pollution and odor than landfilling
3.	Waste recycling	Recycling bins for plastic bottles, glass bottles, aluminum cans, and recyclable paper are placed in most of the housing estates in the society.	Effectiveness – low effectiveness as some cleaners don't help recycle the wastes but place the recycle waste into the trash. Feasibility – citizens may not recycle waste due to the inconvenience/low environmental awareness, low incentive/motivation among the recycling industries to operate the business
4.	Waste reduction at source (e.g. Food Wise Campaign)	About 400 eateries have joined the Food Wise Eateries Scheme. The scheme encourages restaurants and their customers to join forces to reduce waste at source.	Effectiveness -reduction at source – the best option in the waste hierarchy coverage – limited coverage, limited eateries and customers join the scheme

(P.134)

Suggested Guidelines

c. According to Source A, identify and explain the features of food waste in Hong Kong. (4 marks)

Guidelines:

Read the source carefully and complete the table below.

	Guiding questions	Evidence in Source A
1.	Size of the food waste? (getting much/less)	- Total quantity of food waste is increasing.
2.	Composition of the food waste? (proportion of domestic waste/C&I waste?)	- Domestic waste takes up the largest proportion - Rapid increase can be found in C&I waste

Remarks:

1. Identify the features (include all three features)

2. Give evidence (cite data from the source)