



Ho Koon Nature Education cum Astronomical Centre  
(Sponsored by Sik Sik Yuen)

# Liberal Studies

## Student Handbook

### Topic: Energy

Date : \_\_\_\_\_

Group : \_\_\_\_\_

Group Leader : \_\_\_\_\_

Group Member : \_\_\_\_\_

\_\_\_\_\_

**A. Objectives :**

Learning experience earned from independent enquiry study can help students to:

1. Set their own learning target; learn how to draft and implement their learning plan and how to solve problems.
2. Investigate electricity consumption in Tsuen Wan to understand the real situation of energy consumption.
3. Learn how to collect data, evidence and other information through study.
4. Understand the role of the individual on environmental protection.

**B. Schedule :**

Time	Activities
9:00 – 10:00	Introduction
10:00 – 11:00	Group discussion and presentation
11:00 – 12:00	Lunch
12:00 – 14:00	Field work
14:15 – 15:15	Data analysis
15:15 – 16:45	Presentation and Conclusion

**C. Equipment list :**

	Items	Quantity	Checked	Returned
1.	Electronic Thermo-Hygrometer	x 1	<input type="checkbox"/>	<input type="checkbox"/>
2.	UV Index Meter	x 1	<input type="checkbox"/>	<input type="checkbox"/>
3.	Photometer	x 1	<input type="checkbox"/>	<input type="checkbox"/>
4.	Anemometer	x 1	<input type="checkbox"/>	<input type="checkbox"/>
5.	Sound level meter	x 1	<input type="checkbox"/>	<input type="checkbox"/>
6.	Clipboard	x 1	<input type="checkbox"/>	<input type="checkbox"/>
7.	Map	x 1	<input type="checkbox"/>	<input type="checkbox"/>

**D. Focus of the study :**

According to government information, the commercial electricity users take up 66% of Hong Kong total electricity use and the average annual growth of commercial electricity use is 3.66%, six times of the 0.66% annual growth of Hong Kong population. Some green groups pointed out that the estimated electricity consumption would reach 53 billion kWh by 2020 with the emission of 31,000,000 tonnes of carbon dioxides if this consumption pattern remains. Some shops or malls turn on the light in daytime or intentionally lower the temperature by 1 to 2 degree Celsius to attract customers. You can investigate in Tsuen Wan in groups (5 to 6 members in each group) after selecting study theme and devising an investigation plan. Report the results in class and write a report on this study.

# Liberal Studies: Energy

## Background

From 1997 to 2008, the population of Hong Kong has increased by 7.6% while a 27 % increase of electricity consumption was recorded. Carbon dioxide, which will be produced during the process of electricity generation, is one of the major greenhouse gas that cause global warming.

According to the World Meteorological Organization, year 2010 is almost certain to rank among the top 3 warmest years globally since the beginning of instrumental climate records in 1850. In Hong Kong, the annual mean temperature in 2010 ended up to 23.2 degrees. During the year, there were 13 very hot days and 21 cold days, 3 days and 2 days more than normal respectively. In 2011, Hong Kong experienced one of the hottest August since records began in 1884. The monthly mean temperature soared to 29.5 degrees. All these facts reflect that global warming is affecting our city. (Hong Kong Observatory)

Global warming is the main problem of the world. However, some shops still use large amount of floodlights to illuminate their billboards even in daytime to attract attention. According to the data from Electrical and Mechanical Services Department, nearly 20% of electricity spent on illumination in 2004. Some lights are considered as unnecessary or too strong. Green Sense, a green group, found that some 1029 spotlights in three main streets of Mong Kok turning on during daytime. (Green Sense 2007)

Green Sense conducted a survey on the temperature in the 50 biggest malls in Hong Kong. It found that the average temperature at the 50 malls was 22.6 degrees and twelve of them with average temperature lower than 22 degree. Some malls still cold like a “fridge” at night although traffic flow decrease.

The management of the malls intentionally lowers the temperature by 1 to 2 degree to retain customers who like to “cool themselves down” in the mall. However, this is energy wasting and people who expose to a cold environment for a long time, may hit by “air-con sickness” with symptoms including headache, running nose and allergic rhinitis.

Major shopping centers spend an average of HK\$1.15 million monthly on electricity. Lifting the temperature by 2 to 25 degrees would bring 8 to 10 percent in air-con savings, resulting in rent reduction or freezing of mall tenants. The environment can be protected by saving electricity. (Green Sense 2008)

## 2. Concept map

Draw a concept map, mind map or other diagrams to connect and organize all the concepts related to the study.



# 3. Proposal



Topic : \_\_\_\_\_

Related concepts : \_\_\_\_\_

Aims : \_\_\_\_\_

Focusing Questions : \_\_\_\_\_

Research methods : \_\_\_\_\_

## Teacher comments

Topic : \_\_\_\_\_

Focusing Questions : \_\_\_\_\_

Research methods : \_\_\_\_\_

# 4. Hints on proposal and report writing

## 1. Study topic

- List out all the areas of interest after brainstorming and screen out feasible study topic within the list.
- Topic should meet at least two of the following conditions
  - Interesting
  - Valuable to solve
  - Able to solved
  - Have ways to solve
  - With information to solve
  - Possible to solve
  - With enough time to solve
  - There is a room to express your personal opinions and can solve the problem in creative way



(Reference: Teaching Resources, The Hong Kong Institute of Education)

## 2. Introduction

Included background, related concepts and knowledge of study topic

Try to answer the following questions:

- What information or knowledge do you know about the study topic?
- What interested you in that particular topic?
- What concepts or knowledge involved in this topic?

## 3. Aim

Two to three aims are enough. Try to answer the following questions:

- What do you expect to find through this study?
- What other investigations do you need to do?

## 4. Questions

Identify two to three important questions (depends on the study time you spend) of the study to make the study more focus.

- What do you want to know? (Raise the questions that you are interested in)
- Use 5W+1H, i.e. Who, What, When, Where, Why, How to help organizing problems and think systematically.
- Ask investigatory questions (i.e. How or Why questions).
- Draw a mind map on your study topic. Identify the interesting parts and rewrite them into investigatory questions.

## 5. Methods

Please think carefully on the following questions about the method(s) you employ:

- Dangerous or not? (If yes, do not use it!)
- Related to investigatory questions or not?
- With enough time and resources or not?
- Feasible or not?
- Do the information you want to get open to public or can be obtained easily?
- Do the respondents really want to be interviewed? Please answer the following questions before conducting interview:
  1. Who will be the respondent?
  2. What are the questions? (Three to four questions are good enough)

## 6. Result analysis

- Organise all the information you collected and identify useful information
- Use text and table to present your data
- Use reference information to help explaining data

## 7. Conclusion

- Support your arguments with data and make conclusion.
- Answer all questions you raise in the study

## 8. Self-reflect or suggestions

- Express you personal opinions on study result
- Raise out the shortcomings of the study
- Suggest improvements

## 9. Appendix

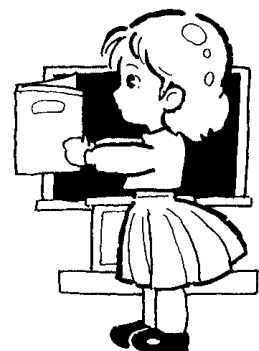
Included:

- Information record table
- Interview record table
- Questionnaire sample
- Other information record table

## 10. Reference

Report should include all the following reference information:

- Books
- Journals
- Websites
- Magazines
- Other reference information you used



# 5. Memo to students

## Pre-field trip preparation

Please prepare the following before field trip:

1. Please divide in groups with five members each. Eight groups at most.
2. Please read all the information provided by our centre before field trip. (Please see “Data collection” section in detail)
3. Please collect information you need beforehand and have brief understanding about the aim of the field trip.
4. Please complete concept map and proposal section in the student handbook before the field trip.
5. All the teachers and students should prepare with the following guideline.

## Personal preparation and equipments:

1. Sufficient rest and sleep. (8-hour sleep is suggested)
2. Have breakfast before field trip.
3. Wear sport or proper clothing. (Suggestions: long or short shirt, trousers and wind-breaker when necessarily)
4. Wear sport shoes.
5. Bring along sufficient drinking water.
6. Bring umbrella, mosquito repellent and sunscreen lotions when necessary.

## During the field trip

1. Safety is the most important consideration to all members.
2. Beware of the weather change. In case of the weather condition worsening, teachers may cancel the field trip.
3. All participants should work in groups. No participant should work alone.
4. Participants should work in location where your teacher assigned, take note of the time of assembly and complete the study on time.
5. Be considerate of others during the field trip in terms of noise.
6. Respect other person’s privacy when taking photos for your own record during field trip.
7. Please report to your teacher as soon as possible if you feel unwell or in case of emergency.

## Data collection

### A. Related websites

#### 1. 環保觸覺

<http://www.greensense.org.hk/>

- 香港商場 秋季最浪費冷氣 12 個商場低於 22 度  
[www.greensense.org.hk/aircon/GreenSense\\_PressRelease\\_20081109.doc](http://www.greensense.org.hk/aircon/GreenSense_PressRelease_20081109.doc)
- 白天逾千盞燈照開 金舖及影音店最嚴重  
[www.greensense.org.hk/toomuchlight/GreenSense\\_PressRelease\\_20070726.doc](http://www.greensense.org.hk/toomuchlight/GreenSense_PressRelease_20070726.doc)
- 金舖嚴重超標 光度達 4200lux 燈飾店及部分商場過光  
[www.greensense.org.hk/toomuchlight/GreenSense\\_PressRelease\\_20070826.doc](http://www.greensense.org.hk/toomuchlight/GreenSense_PressRelease_20070826.doc)
- 商場空間大浪費冷氣 向週邊噴出大量熱氣 環境代價大  
[www.greensense.org.hk/densebuilding/greensense\\_pressrelease\\_20091206.pdf](http://www.greensense.org.hk/densebuilding/greensense_pressrelease_20091206.pdf)

#### 2. 荃新天地耗資半億建綠色商場 首創全港最大「直立花園」(2007 年 10 月 31 日)

[http://www.sino-land.com/cht/default.asp?cm=popup&xid=mr\\_apr\\_detail&name=000514&ver=1](http://www.sino-land.com/cht/default.asp?cm=popup&xid=mr_apr_detail&name=000514&ver=1)

### B. 報章資料：

#### 1. 西鐵車廂低溫 19.8°C 港淪「城市雪房」 民眾易患冷氣病 (成報 2011 年 8 月 16 日)

<http://www.singpao.com/NewsArticle.aspx?NewsID=189073&Lang=tc>

#### 2. 商場發水喉冷氣阻通風 (太陽報 2009 年 12 月 07 日)

[http://the-sun.on.cc/cnt/news/20091207/00407\\_038.html](http://the-sun.on.cc/cnt/news/20091207/00407_038.html)

#### 3. 團體指商場「發水」嚴重 (星島日報 2009 年 12 月 7 日)

<http://news.sina.com.hk/cgi-bin/nw/show.cgi/2/1/1/1351543/1.html>

#### 3. 入秋商場仍冷 室外差 10 度 長沙灣廣場 20.8 團體批未因應天氣調節 (明報 2008 年 11 月 10 日)

<http://news.sina.com.hk/cgi-bin/nw/show.cgi/2/1/1/934028/1.html>

#### 4. 冷氣仍勁開 商場如雪房 (頭條日報 2008 年 11 月 10 日)

[http://www.hkheadline.com/news/html\\_wnn/html/2008/11/10/wnn64038.html?section\\_name=wnn](http://www.hkheadline.com/news/html_wnn/html/2008/11/10/wnn64038.html?section_name=wnn)

#### 5. 強光加劇「熱島效應」 憂嚇走遊客 (文匯報 2007 年 8 月 27 日)

<http://paper.wenweipo.com/2007/08/27/HK0708270018.htm>

#### 6. 旺角百呎店射燈 81 盞 環團調查 商店太光 (明報 2008 年 1 月 21 日)

<http://hk.news.yahoo.com/article/080120/4/6pa9.html>

# 6. Sample record form

Please construct your own table according to your need.

## A. Table of Observation Record

Focus of observation	Observation
Features of the environment or place	
Atmosphere of the environment or place	
Characteristics of citizen	
Behavior of citizen	
Impact of interaction on human, environment and place	
Special events or features, number of occurrence	
Personal impression	

## B. Table of Investigation Record

Study topic:	
Date and Time:	Place:
Investigation objects:	Number of persons involved:
Aim:	
Method and Content: (Questionnaires, Street interview, On-the-spot record)	
Summary of the result:	
Self-reflect after investigation: (Goal achieved? Smooth or not? What do you know through this investigation? What else need to follow?)	

## C. Table of Interview Record

Study topic:	
Date and Time:	Place:
Investigation objects:	Number of persons involved:
Aim:	
Focus of the interview:	
Summary of the interview:	
Self-reflect after investigation: (Goal achieved? Smooth or not? What do you know through this interview? What else do you need to follow?)	

(Reference: 張人紅(2002)《研究性學習管理用書》，南寧：廣西人民出版社