Personal, Social & Humanities Education
Key Learning Area

Geography Curriculum Guide
(Secondary 1-3)

Prepared by
The Curriculum Development Council

Recommended for use in schools by
The Education Bureau
HKSARG
2011

SECONDARY SCHOOLS
CURRICULUM GUIDE

PERSONAL, SOCIAL AND HUMANITIES EDUCATION KEY LEARNING AREA

GEOGRAPHY CURRICULUM GUIDE (SECONDARY 1-3)

PREPARED BY
THE CURRICULUM DEVELOPMENT COUNCIL
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Preamble

The Geography Curriculum Guide (Secondary 1-3) is one of the series prepared by the Curriculum Development Council, Hong Kong for use in secondary schools.

The Curriculum Development Council is an advisory body giving recommendations to the Hong Kong Special Administration Region Government on all matters relating to curriculum development for the school system from kindergarten to sixth form. Its membership includes heads of schools, practising teachers, parents, employers, academics from tertiary institutions, professionals from related fields or related bodies, representatives from the Hong Kong Examinations and Assessment Authority and the Vocational Training Council, as well as officers from the Education Bureau.

This Curriculum Guide is recommended by the Education Bureau for use in secondary schools. The Curriculum Development Council will review the curriculum from time to time in the light of classroom experiences. All comments and suggestions on the Geography Curriculum Guide may be sent to:

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Chapter 1 Introduction

1.1 Geography as a discipline and its role in the school curriculum

Geography is a discipline that enables us to understand the Earth in which we live from a spatial and an ecological perspective. It is about the study of places and regions, including their locations, their characteristics, processes that shape them, as well as how and why they are changing. It develops knowledge and understanding of the distribution of physical and human phenomena, and interprets patterns and processes that affect our physical and human worlds. Geography is also concerned with the interactions between people and environments. It looks at how physical systems affect human activities and how human actions modify physical environments. It analyses the impact of people-environment interaction and explains the diverse responses of people in different places at different times. In addition, geography makes global understanding possible through studying the interconnectedness and interdependence of not only places, but of the physical, economic, political and social contexts in which we live. In this connection, geography involves the study of contemporary issues of sustainability on different scales (from local to global), with particular focus on how people-environment interactions can be managed and improved in a sustainable manner.

As a school subject, geography stimulates students' interest in and a sense of wonder about people, places and environments. It helps our students make sense of our complex and dynamically changing world. The subject facilitates our students to gain a better understanding of different places in the world, including our home city Hong Kong, our home country China, as well as other places beyond students' direct own experience. Geography also facilitates students to develop world knowledge and understanding. It provides the essential background knowledge for understanding many important global issues such as climate change, globalisation, changing availability of water resources, population and urban problems, to name but a few. Moreover, geography enables students to integrate the knowledge of the physical and human worlds and gain a better understanding of the interaction between human and natural environments. Students will also know more about the concept of sustainable development through the study of geography, and be able to understand better how local, national and global issues could be resolved and managed in a sustainable way.

Another major role of geography in the school curriculum is to equip students with geographical enquiry skills that are essential for developing spatial and environmental understanding of the world. Geographical enquiry encourages critical investigation of issues that affect the world and people's lives, now and in the future. Through the study of geography, students will be equipped with the ability to identify and ask questions from a geographical perspective, to locate and extract appropriate information from a variety of sources relevant to the enquiry, to present and organise

information and data in appropriate formats, and to interpret information and data for making inferences and drawing conclusions. They will also learn how to conduct fieldwork investigation to obtain first-hand information and data for their enquiries. Moreover, students will have ample opportunities to develop their abilities to read and interpret verbal, visual and digital media, including different types of maps, a range of written information, a variety of graphs and charts, as well as various kinds of photographic images and digital data (e.g. GIS).

Geography also plays a significant role in developing our students into informed and responsible Chinese and global citizens. The study of local and national issues provides basic knowledge of the places in which our students live, work, study and play, and helps cultivate students' concern for and commitment to the betterment of our home city and our nation. On the other hand, in examining regional and global issues, students will know more about other places which are connected to Hong Kong and China, such as through climatic processes, population movements, trade and investment, tourism, cultural influences and political relationships. With this knowledge, our student will be better equipped to make informed decisions to handle challenges in the future, to cultivate their values and responsibilities to other people and the environment, as well as to explore their own place in the world.

1.2 Curriculum Aims

The aims of this curriculum are to enable students:

(a) to develop knowledge and understanding of space, place and environment, in particular the spatial arrangement of places and the interaction between human and the environment;

(b) to think and to enquire in a geographical manner;

(c) to develop geographical skills and basic competencies for further studies and life situations; and

(d) to be informed and responsible citizens who are willing to act for the betterment of their home city, home nation and the world, and to contribute to the sustainable development of human societies and the natural environment.

1.3 Objectives

In relation to the above aims, students should be able to:

1.3.1 Knowledge and Understanding

(a) develop a thorough understanding of key geographical concepts, including space, place, region, human-environment interaction, global interdependence and sustainable development, and apply them in new situations and contexts;

(b) develop a solid framework of place knowledge, including the knowledge and understanding of places in the local region (Hong Kong and Zhujiang Delta Region), other places in China, the Asia-Pacific and the world, and the interconnectedness among these places;

(c) describe and explain the interactions between human and the natural environment over space and time, including the physical and human processes that involved in such interactions, and the patterns and impacts created by such interactions;

(d) understand how the natural environment influence human life and how human activities alter the natural environment; and

(e) develop a knowledge and understanding of the major issues of global concern, and how these issues can be managed and/or resolved in a sustainable way.

1.3.2 Skills

(a) think geographically, guided by the following questions:
   i) "Where is it?" and "What is it like?"
   ii) "Why is it there?" and "How did it happen?"
   iii) "How and why is it changing?"
   iv) "What impacts does it have?"
   v) "How should it be managed?"

(b) master basic geographical enquiry skills, including the ability to :
   i) ask geographical questions;
   ii) locate and collect information and data relevant to the enquiry from a variety of sources;
   iii) organise and present information and data in appropriate formats; and
   iv) analyse and interpret information and data for drawing conclusions.

(c) master basic geographical skills, including the ability to :
   i) read and interpret different types of atlases, maps and plans at a variety of scales;
   ii) construct maps and plans using symbols, annotations, keys and scales;
   iii) select and use fieldwork techniques (e.g. observing, measuring, interviewing, recording, photographing, sketching) and instruments (e.g. cameras, data logging devices, GIS);
   iv) read and interpret different types of photographs and satellite images; and
   v) select and use appropriate graphical and IT techniques to present data on maps and diagrams (e.g. pie charts, GIS).

(d) master basic competencies, e.g. communication skills, critical thinking skills and creativity, through the enquiry of geographical issues, including the ability to:
   i) communicate and exchange ideas in appropriate ways, in particular the use of IT (e.g. PowerPoint presentation, sharing of fieldwork data via e-mail);
   ii) assess the information collected, and determine what and what not to believe; and
   iii) view situations from different perspectives, such as to explore the diverse responses of people living in different places towards natural hazards from perspectives other than spatial and ecological, e.g. cultural, economic, political and socially responsible perspectives.

1.3.3 Values and Attitudes

(a) be commit to actions conducive to a better environment and to the sustainability of the world;

(b) develop a sense of belonging to our society and nation, and be willing to take action for the betterment of our society and nation;

(c) be aware of the increasing global interdependence and the importance of international cooperation in handling global issues;

(d) show concern for the people who are less privileged and who are suffering from various types of problems; and

(e) develop an understanding and respect for other people, their values, cultures and ways of life.

Chapter 2 Curriculum Framework

2.1 Background

Geographical education at junior secondary level should aim at enabling our students to develop basic geographical literacy and competency. Apart from helping students to acquire the essential geographical concepts, knowledge and skills for senior secondary education, the subject should also equip students with fundamental knowledge and skills to tackle problems and challenges in their daily life. One should be fully aware of the fact that not all junior secondary students will be taking geography when they are promoted to the senior secondary level. Therefore, junior secondary geography is most likely the only chance for some of our students to receive basic geography training. In view of this, the design of the junior secondary Geography curriculum has to strike a delicate balance between the need to stimulate students' interest in geography and arouse their curiosity about our physical and human worlds on one hand, and the requisite to introduce the basic disciplinary essence of the subject on the other.

Another prime concern for the design of this curriculum is the diversified modes of curriculum planning adopted by local secondary schools in their junior secondary PSHE curriculum. To cater for the needs of those schools adopting integrated and combined subject modes of curriculum planning, the framework of this curriculum has to be kept flexible and versatile, allowing the maximum degree of school-based tailoring.

Furthermore, the existing S1-3 Geography curriculum has been implemented for more than ten years and a number of new developments have made part of its content or the direction of enquiry obsolete. In the study of industrial location, for instance, Japan's development in the eighties serves as a suitable case study for understanding how the conventional factors affect the location of manufacturing industry. However, with Japan's fading economic vitality in the past decades, and the appearance of a number of new location factors, such as research and development, the study of "Japan Industrial Miracle" is no longer an appropriate topic in geography. The recent trend of the global shift of manufacturing industry in terms of location and function put a pressing need for curriculum revision.

Geographical education has advanced in a number of ways for the past ten years. On the technical side, geo-informatics techniques, including GIS, have become a common tool used by geographers as well as geography students to facilitate their research and study of the subject. It is thus essential to provide our junior secondary geography students with a basic understanding of what GIS is and how it can be used for studying geography.

In terms of curriculum framework and approach, there is an increasing emphasis on the balance among "matter, method and mission". In addition to the continuous adoption of issue-enquiry approach, there is a recent trend to include a second focus on "modern regional geography". It does not mean to go back to "facts and figures", but to adopt a postmodern approach aiming at providing students with a "contemporary world view" and enabling them to look at 'regions' under the perspective of changes and development.

Last but not the least, with the increasing influence of China in global political, socio-economic and environmental issues, there is also a need to provide our junior secondary students with a more comprehensive understanding of our mother country. The S1-3 Geography curriculum obviously has a vital part to play through offering a more systematic and in-depth study of China.

2.2 Design Principles

This curriculum should:

(a) build on the knowledge, skills, values and attitudes, and learning experience acquired and developed by students through their study of the General Studies curriculum in primary education;

(b) achieve a balance between breadth and depth in the study of geography to suit the needs of different students taking different pathways after the completion of junior secondary education;

(c) achieve a balance between the learning of theoretical knowledge and its application to life situations by giving equal emphasis to the development of conceptual knowledge of geography and a better understanding of geographical issues relevant to students' present and future lives;

(d) provide a flexible and diversified framework capable of:

  i) allowing its adoption into the various types of school-based PSHE curricula developed by different schools, and

  ii) catering for student diversity in abilities, needs and interests;

(e) enable our students to understand how geography has meaning and relevance to their own lives and can assist them in making decisions and taking action;

(f) not confine school geography to local and nearby regions, but build on students' curiosity and encourage them to explore the whole world;

(g) provide ample opportunities for students to develop a wide range of skills, including those involved in:

  i) using and interpreting maps, photographs, satellite images and information technology (including GIS),

ii) undertaking enquiry-based fieldwork in a range of settings, and
iii) tackling issues, solving problems and making decisions;

(h) enable teachers to use enquiry-based and problem-solving methods of learning and teaching;

(i) reinforce student learning through allowing the adoption of a wide variety of out-of-classroom learning activities (e.g. fieldwork);

(j) integrate the learning of IT skills in the study of geography; and

(k) promote our students to develop investigative and critical approaches to learning, and provide opportunities for their creativity to flourish.

2.3 Curriculum Structure

This curriculum consists of three sections, namely "Section A: From Hong Kong to the World — Variations in space, people and places", "Section B: From China to the World — Enquiring regional problems arising from human-environment interactions" and "Section C: Challenges for our world — Managing global issues in a sustainable way". They are designed to facilitate students' understanding and application of key geographical concepts, including 'space' and 'place' for Section A, 'region' and 'human-environment interaction' for Section B, and 'global interdependence' and 'sustainable development' for Section C. Each section consists of four modules, making up a total of twelve modules for the whole curriculum. Each module focuses on a major geographical theme that involves the study of core geographical concepts and knowledge through the investigation of a related issue.

The four modules of Section A are designed to involve students in enquiring the issue in local context (Hong Kong), and then extending their investigation to national (China), regional (Asia and the Pacific) and finally to global scale. Such design enables students to master the key geographical concepts 'space' and 'place', and allows them to understand how the interaction of physical and human processes in different places creates varying geographical patterns and phenomena. The two modules on "City" and "Natural Hazards" in Section A are core modules. The remaining two, "Tourism" and "Climate Change" are elective modules and students are requested to select one to study.

Section B contains four modules in which the two on food and water problems in China are core modules. The remaining two are elective modules and students have to choose one to study. Similar to Section A, the design involves student to enquire an issue in national context, and then extending the investigation to regional and global scale. The modules included in this section are about how the physical environment influences human activities and how human activities modify the physical environment. The aim of this section is to help students master the key geographical concept 'region' and 'human-environment interaction', with particular emphasis on the impacts of people-environment interactions and the diverse responses of people towards these impacts.

Section C also contains four modules with the two on manufacturing industry and energy being the core. Again, all students have to select one of the remaining two in Section C to study. The modules of this section are designed to facilitate the understanding of the concepts ‘global interdependence’ and ‘sustainable development’. The modules aim at enabling student to appreciate the increasing interconnectedness and interdependence of our world, and how global issues could be managed in a sustainable manner.

On the whole, all students have to study 9 modules within three years. The 9 modules include 6 core modules (2 from each of Section A, Section B and Section C) and 3 elective modules (1 from each of Section A, Section B and Section C). If time and student ability allow, teachers can consider finishing some or all of the remaining modules.

Core Modules	Elective Modules	
Using Urban Space Wisely - Can we maintain a sustainable urban environment?	Tourists - Friends or foes?	Either One
Living with Natural Hazards - Are we better equipped than the others?	Changing Climate, Changing Environments	
Food Problem - Can we feed ourselves?	Population Problems - Just about numbers?	Either One
The Trouble of Water - Too much and too little	Taming the Sand - A long-lasting combat against desertification and sandstorms	
Global Shift of Manufacturing Industry - Opportunities and threats	The Geography of Disease - Facing a spreading risk	Either One
Scramble for Energy	Oceans in Trouble	

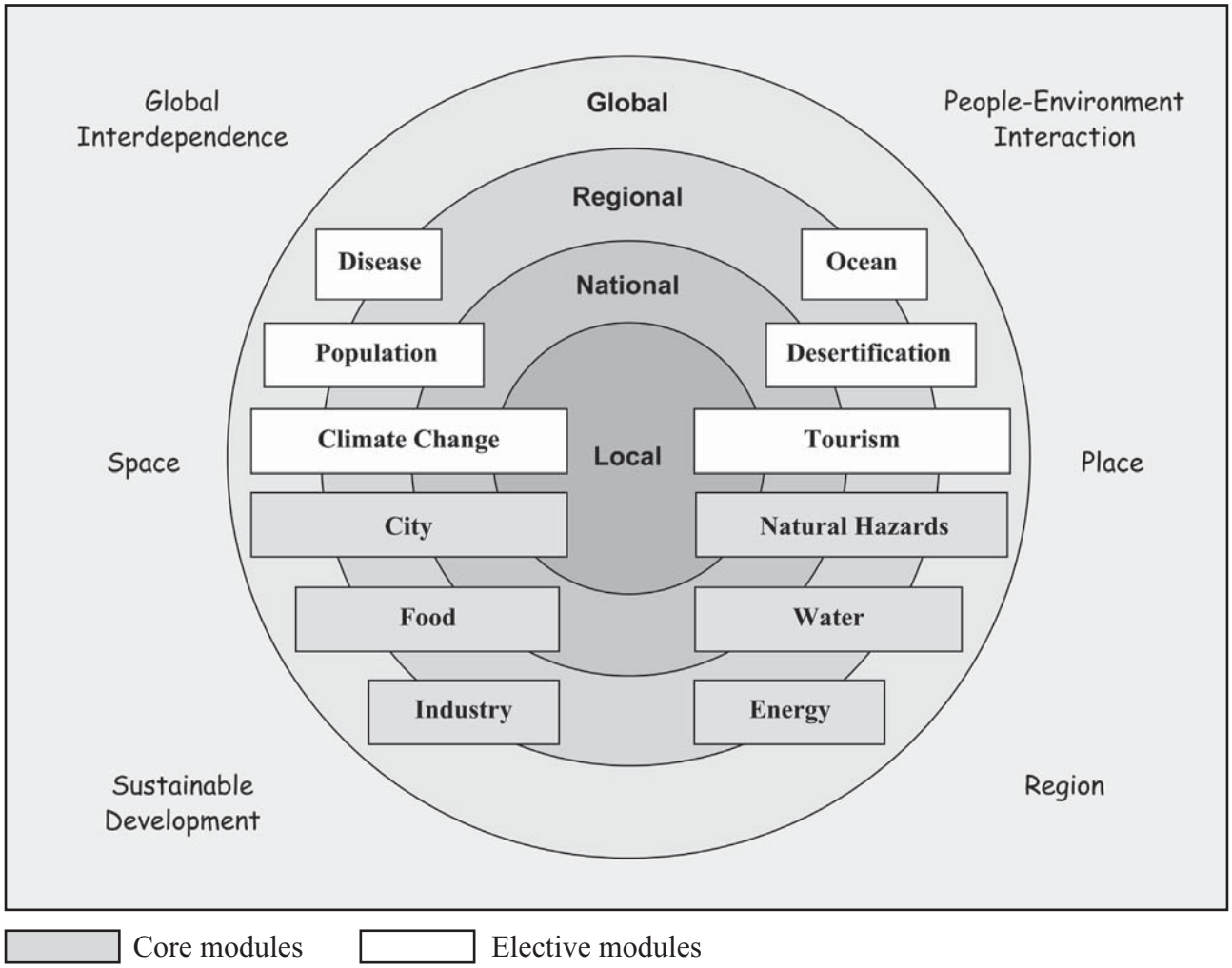

Figure 2.1 Curriculum Structure: Modules, key concepts and areal coverage

2.4 Time Allocation

This curriculum has been compiled on the assumption that schools will devote at least 100 hours[1] to the teaching of geography in Secondary One to Three. It is suggested that each module, no matter core or elective, should be given at least 11 hours[2] of classroom teaching time, making up a total of 100 hours for the teaching of the six core and three elective modules. The teaching hours allocated for the study of each module has already included the time required for conducting fieldwork and spatial data enquiry activities.

2.5 Essential Learning Elements

The open framework of PSHE, while allowing schools flexibility in the way they handle the scope and depth of the content to meet the different needs of students, should not deprive them of the opportunity to learn certain 'essential elements' in this Key Learning Area. To ensure that schools include these core contents in their curriculum plans, the essential learning elements of junior secondary geography is delineated in Figure 2.2 on the following pages.

These essential learning elements are set out as a primary resource list for schools to plan and review their curriculum, so that relevant learning experiences are provided to ensure all students will acquire the basic knowledge, concepts, skills, values and attitudes. Schools and their respective KLA coordinators and subject panel heads should ensure that these elements are covered in their school curriculum. This is particularly crucial for schools which choose not to offer geography as an independent subject but to incorporate learning elements of geography into their school-based integrated subject programmes.

The essential learning elements are based on a review of a number of overseas geography curricula, teachers' opinions collected from the "Research on Teachers' Views of Essential Learning Outcomes in PSHE at the End of Secondary 3", and the views of a group of professionals from tertiary institutions, experienced teachers and curriculum developers. In response to the emergence of new knowledge and events in society, these elements are subject to modification and amendment as needs arise.

1 100 hours over three years are approximately equivalent to 150 forty-minute periods in a six-day cycle timetable.
2 11 hours of teaching time are approximately equivalent to 16.5 forty-minute periods in a six-day cycle timetable.

Knowledge and Understanding
1. The location of places and landscapes, including why they are there, the patterns and distributions they created, how and why these are changing and their implications for people 2. The distribution of major physical and human patterns at different scales (from local to global) 3. The geographical processes that created the distribution of major physical and human patterns and their interactions across space 4. The physical and human characteristics of places 5. The physical and human processes that shape places 6. The concept of region as an area of Earth's surface with unifying geographic characteristics 7. The similarities and differences among regions 8. The ways in which regions change and the factors contributing to these changes 9. The effects of the characteristics of physical environments and processes on human activities 10. Human responses to variations and changes in physical environments 11. Human modification of the physical environment, and its consequences on places and environments 12. The meaning of sustainable development and how it is implemented in different places and different occasions 13. Major local, national and global environmental issues, including their causes, the tension involved, and how they can be managed in a sustainable way 14. The economic, environmental, political and social interactions among places and regions 15. The changes caused by human action in one place leading to changes in other places

Skills
1. Identify geographical issues and ask / pose geographical questions 2. Select and extract geographical data from a range of sources[3] 3. Organise and present geographical data in appropriate formats[4] using appropriate techniques for summarising[5] 4. Observe and interpret patterns, trends and relationships from processed geographical data 5. Make inferences / generalisations and draw conclusion from analysed geographical information and data 6. Read maps of different kinds[6] and at different scales 7. Find specific information in an atlas by using the index and contents pages 8. Locate specific features and places on a map using coordinates and references[7] 9. Measure distances and areas on maps using linear scale and RF 10. Identify and describe spatial patterns on a map 11. Construct an annotated cross-section from a contour map 12. Calculate the gradient of a slope 13. Interpret a contour map to describe the relief of an area and identify landform features[8] shown on the map 14. Use GIS software to organise geographical data and to construct a simple map 15. Follow a route on a given map in the field, and be able to identify conspicuous features from the information shown 16. Use a variety of skills[9] to measure, map and record geographical data in the field 17. Use a variety of tools[10] to measure, collect and record geographical data in the field 18. Draw annotated field sketch[11] to record and interpret geographical information 19. Undertake sampling[12] in the field

3 Refer to both primary and secondary sources, e.g. field data, documents, maps, charts, photos, GIS data, and websites
4 Refer to text (e.g. reports, tables, summaries) and illustrations (e.g. maps, diagrams, models, sketches, graphs)
5 Refer to descriptive statistics such as average, median, mode and range, etc.
6 Refer to floor plans, street directories, atlas maps, topographic maps, HMC20C maps, etc.
7 Refer to letter/number coordinates, 4-figure references, 6-figure reference, longitudes and latitudes
8 Refer to features like ridge, plateau, slope (convex, concave, steep, gentle), valley, spur, saddle, knoll, escarpment, cliff, etc.
9 Including observation, sketching and annotating, interview, field survey, land use plotting, traffic/pedestrian count, photo/video shooting, data logging (GIS/GPS), etc.
10 Including 16-point compass, clinometer, measuring tape, digital weather meter, data logging devices, etc.
11 Using mapping conventions such as titles, scale, north point and legend, etc.
12 For example: random, systematic and stratified sampling techniques

Skills
20. Identify and calculate totals, averages[13], frequencies, ranges[14], densities, ratios and percentages 21. Construct and interpret pie charts, bar, column, line, climatic and proportional graphs 22. Construct flow diagrams to illustrate inputs, outputs, elements, feedback and other aspects of geographical systems 23. Read and interpret oblique, aerial, ground-level and satellite imagery 24. Recognise features and patterns shown in an aerial photograph and identify them on a map of the same area 25. Read simplified weather charts[15]

13 Including means, modes, medians
14 Including maximum and minimum
15 Including temperature, precipitation, wind speed and direction, high and low pressure and specific systems like typhoon

Values and Attitudes
1. Appreciate the beauty of nature 2. Appreciate the interdependence between human beings and the natural environment 3. Be sensitive to the development of the surrounding environment 4. Develop an eagerness to know more about China 5. Show concern for the problems that affect China 6. Develop a sense of belonging to society and nation and become an active and responsible citizen 7. Be aware of the increasing global interdependence and understand the importance of international solidarity and cooperation 8. Develop a sense of wonder and curiosity about peoples, places and environments 9. Develop a sense of responsibility towards the building of a better world 10. Express empathy towards the problems and difficulties encountered by other people in different parts of the world 11. Develop an understanding and a respect for people, their cultures, values and ways of life 12. Understand the differences and similarities between people, places, environments and cultures 13. Appreciate how people's values and attitudes differ and how these differences may influence their perceptions and responses to geographical issues

Figure 2.2 Essential Learning Elements of S1-3 Geography curriculum

2.6 Content Outline

The specific contents suggested for the twelve modules of this curriculum are listed in the tables on the following pages. The guiding questions included in each table represent a possible way of studying the related issue. Teachers are reminded that there could be alternative ways of structuring the enquiry of an issue, and they should always exercise their professional judgement in designing the flow of their lessons based on the interest, abilities and needs of their students. The same principle applied to the knowledge, skills, and values and attitudes suggested for the module. Teachers only need to ensure that after the completion of the whole curriculum, all the essential learning elements recommended in Section 2.5 are covered in their teaching. They could feel free to decide which concepts or skills should be included in the teaching of individual modules.

A number of specific examples are suggested for each of the twelve modules. The purpose of these specific examples is to enhance the areal coverage of the module so as to strengthen students' global perspective, enabling them to have a better understanding of what is happening in other parts of the world. For students of average ability, teachers can simply give a very brief overview and do not need to go into details. If time and students' ability allow, teachers can consider turning the examples into case studies, engaging their students into more detailed enquiry.

Teachers should also note that each module comes with an introduction. The first paragraph of the introduction is about the major foci of the module, highlighting the rationale of choosing that particular theme and the key learning elements that should be covered. The second paragraph is mainly on catering for student diversity, in particular the difference in learning ability. Suggestions on how to tailor the curriculum content to cater for students of different learning abilities are included, such as excluding the teaching of some specific examples or introducing additional learning activities.

Section A: From Hong Kong to the World — Variations in space, people and places

Using Urban Space Wisely — Can we maintain a sustainable urban environment?

Urban land use and urban problem are two core themes in geography. Urban land use patterns and urban problems reflect the spatial interaction of physical settings and human processes in cities. Through the study of this module, students can understand how various geographical factors shape the internal structure of a city by a very brief comparison of Hong Kong with a Western city, a Southeast Asian city and a South American city. Students can also look into the problems our city is facing and how these urban problems can be solved. The study of urban land use and urban problems do not only enable students to understand major geographical concepts such as location requirement, competition for space, land use conflict, urban growth and redevelopment, sustainable development, etc., but is also important in developing essential geographical skills including map reading, photo interpretation, land use plotting and problem-solving. This module also provides ample opportunities for students to engage in fieldwork enquiry and to master respective enquiry and fieldwork skills, including following a pre-planned route in the field, observing and identifying conspicuous features, collecting data by field survey, undertaking sampling in the field, and many more. Moreover, through enquiring urban issue, it is hoped that students can develop a stronger awareness of what is happening around them and play a more active role in helping to improve the environment of the city they are living in.

A number of specific examples are suggested for teachers to give students a brief introduction on how urban problems can be solved by adopting the concept of sustainable development in urban planning and management. These specific examples can strengthen students' global perspective and enable them to have a better understanding of what is happening in other parts of the world. For students with average ability, it is advisable for teachers to give just a very brief overview of what are happening in other cities and how they try to solve their urban problems in a sustainable way. For those with better ability and interest in urban geography, teachers can consider comparing the case of Hong Kong with those of Guangzhou/ Tianjin, or even a multiple-case comparison including Seoul and Helsinki.

Suggested Time: 10-12 hours

Guiding Questions	• How does our city look like? - What are the major types of urban land use in Hong Kong? How are they distributed? - What is CBD? Where is the CBD of Hong Kong? Why is it there? - Where are the industrial and residential areas in Hong Kong? Why are some residential areas near to industrial areas, but the others are far away from them? - Do cities all look the same? How is Hong Kong different from a Western city (e.g. London), a Southeast Asian city (e.g. Kuala Lumpur) and a South American city (e.g. Rio de Janeiro)? • What problems is our city facing? - Why is the CBD of Hong Kong always so congested? Why are our roads and tunnels always full of vehicles? - Where are the older, inner parts of the city of Hong Kong? What kinds of urban problems can be found here? - Do other cities face the same problems? • How can we solve our problems? - What are the measures taken to solve the urban problems of Hong Kong? - What do we mean by a sustainable city? How can sustainable urban development help to solve urban problems? - What can we learn from other cities (Guangzhou/Tianjin, Seoul and Helsinki)? • In your opinion, what is an ideal city?
Specific Examples	• China: Guangzhou / Tianjin • Asia and the Pacific: Seoul • World: Helsinki
Knowledge	• Major types of urban land use (including CBD and other commercial land use, high-income and low-income residential land use, industrial land use, mixed land use, transport and recreational land use, institutional land use) • Factors affecting urban land use pattern • Urban land use pattern in Hong Kong and a brief review of three other cities in the world (highlighting a few specific land use types / patterns not common in Hong Kong, e.g. port zone, indigenous commercial centre, squatter areas)

	• Hong Kong urban problems (including traffic congestion, pollution, housing and urban decay): causes, characteristics and solutions • A comparison of the urban problems of Guangzhou/Tianjin and Hong Kong • Sustainable urban development and characteristics of a sustainable city • A brief study of Guangzhou (green community) / Tianjin (Eco-city), Seoul (Cheonggyecheon) and Helsinki (Local Agenda 21) in their progression towards sustainable urban development
Skills	• Identify the urban land use pattern of Hong Kong and/or other cities from maps and aerial photographs • Find the location of different cities using an atlas • Identify different types of urban land use from photographs and maps • Follow a pre-determined route in the field and identify various types of urban land use and urban problems along the route • Map urban land use in the field and construct a land use map using GIS software • Sketch a field map to note specific geographical characteristics such as land use, housing conditions, environmental quality, etc. • Undertake sampling in the field to select interviewees for field survey • Conduct questionnaire survey to collect opinions on urban environment • Construct statistical graphs to present and summarise survey results • Compare urban characteristics of two cities based on statistics, maps and photographs • Construct a map or a plan (with proper scale, direction, conventional symbols and legend) to show an ideal city to live in
Values and Attitude	• Show interest in knowing more about other cities in China • Show concern for the problems caused by urban development • Be aware of the conflicting interests of different land users • Appreciate the necessity of tolerance and compromise in resolving urban problems • Develop a sense of responsibility to take action in improving the urban environment

Living with Natural Hazards — Are we better equipped than the others?

Natural hazards have always been part of our life. Even though Hong Kong is not located in the major hazard areas of the world, we still have to face the threat posed by typhoons and landslides. To become informed and responsible citizens, it is essential for our students to understand these two natural hazards in order to prepare for them. In addition, it is also essential for our students to know briefly the major natural hazards affecting the other parts of China and the world. As such, the focus of this module is to provide students with an overview of the three major natural hazards, namely landslides, tropical storms and earthquakes. Students should gain a basic understanding of the causes and the negative impacts of these hazards, as well as the preventive and remedial measures adopted to reduce their damaging effects. Moreover, through the study of typhoon and landslide, students will be able to acquire the basic knowledge about the climate and relief of Hong Kong and South China. They should also have ample opportunities to develop their skills on reading and interpreting contour maps, weather charts, photographs and satellite images, in particular the drawing of cross-section, the calculation of slope gradient and the identification of relief features on a topographical map. It is hoped that in studying the major natural hazards occurred in different parts of the world, students could develop a global perspective and a caring attitude towards the suffering of people living in places far away from Hong Kong.

After completing this module, every student should be able to name the major types of natural hazards that occurred in the world and to identify where these hazards commonly occurred. They should be given a brief introduction of geomorphologic, meteorological and geological hazards through the study of landslide in Hong Kong, typhoon in China/Asia and earthquake outside Asia. For the more able students, teachers can guide students to conduct a comparative study of one particular hazard occurring in both the more developed and less developed areas. Through this study, students should be able to explain why some people are more vulnerable to natural hazards than the others. Teachers can also ask their students to compare the different preventive and remedial measures adopted and try to explain how the variations in measures taken are related to the level of economic development. Moreover, teachers can guide their better students to discuss why people living in different places will have different responses to natural hazards, in particular on why many people still choose to live in hostile areas affected by natural hazards.

Suggested Time: 10-12 hours

Guiding Questions	• Are we living in a hostile world? - What are the major natural hazards of the world? - Where do they commonly occur? • Why do our slopes collapse? - What are the causes of landslides and their effects on Hong Kong? - How do we prepare for and respond to landslides? • Why does most of Asia suffer from strong winds and heavy rain in summer? - What are the causes and effects of tropical storms? - How do Asian people prepare for and respond to tropical storms? • Why does our land shake violently? - What are the causes and effects of earthquakes? - How do people in the world prepare for and respond to earthquake? • Why are some people more vulnerable than we are? - How and why do the effects of natural hazards vary among countries with different levels of economic development? - Why do some people still choose to live in hostile areas affected by natural hazards?
Specific Examples	Meteorological, geological and geomorphologic hazards at the following places: • China: Taiwan, Sichuan, Gansu • Asia and the Pacific: the Philippines, Indonesia, India • World: U.S.A., New Zealand, Central America
Knowledge	• Major natural hazards of the world: earthquakes and volcanic eruptions, floods and droughts, severe storms, and wildfires • Global distribution of the major natural hazards • A brief introduction of the relief of Hong Kong • Causes of landslides in Hong Kong and their effects on Hong Kong people • A brief introduction of the climate of South China (including seasonal patterns, monsoon system, extreme weather conditions in summer: heavy rainstorms and typhoons)

	• The related weather conditions and negative impact brought by typhoons • The global distribution of earthquakes and its relationship with plate boundaries • The primary and secondary damages caused by earthquakes • Preventive (e.g. early warning, education, shelter) and remedial (e.g. emergency aid, improving prediction) measures to reduce the negative effects of landslides, typhoons and earthquakes • A comparison of the impacts of natural hazards and the respective preventive and remedial measures adopted by in the more developed and the less developed regions • Reasons for the people of the less developed regions being more vulnerable to natural hazards than those living in more developed regions • Reasons for people choose to stay in, or are unable to move away from hostile areas affected by natural hazards
Skills	• Identify the warning signals associated with natural hazards in Hong Kong • Identify major relief features on a contour map of Hong Kong • Find the height of the ground and calculate slope gradient from a contour map • Construct an annotated cross-section and calculate its vertical exaggeration • Use GIS software to construct a map showing the distribution of recent natural hazards in the world • Observe in field to identify preventive measures of landslide along hill slope • Read a series of weather charts of Hong Kong to describe the weather conditions within a period of time • Construct climatic graph and describe the temperature and rainfall distribution pattern shown • Identify from satellite images, videos, photographs and news articles the impact of a recent hazard event • Assess real-time information provided by the Hong Kong Observatory to describe the forecasted path of a typhoon
Values and Attitude	• Be aware of the power of nature in influencing people's life • Understand the variations in people's response to natural hazards in different places • Develop a readiness to take precautionary measures to reduce the negative impact of natural hazards • Show concern for the damaging effects of natural hazards on other people and places • Appreciate how people adapt to natural hazards

Tourists — Friends or foes?

Spending holidays abroad has been a very popular recreational activity of Hong Kong people. Worldwide, tourism has also been a rapidly growing industry. This module aims at studying the reasons for and the pattern of Hong Kong people travelling abroad, and more importantly, the opportunities and challenges created by tourism development. Students should focus on investigating the benefits brought by the growth of tourism to the economy and the natural environment, and on the other hand, the negative socio-cultural and environmental impacts of tourism on the host regions. In addition, students should know briefly what sustainable tourism development is and how it is put into practice in different places of the world. In terms of skills development, this module enables students to develop a variety of basic geographical skills including locating places, measuring distance and direction, finding out local times of different places, as well as matching the same features shown in photographs and maps. Last but not least, after completing this module, students should have learnt to be responsible tourists and show respect and care for the lifestyle and habit of the local people, and the culture, tradition and environment of the host region that may be very different from those of Hong Kong.

A number of specific examples are suggested for teachers to strengthen students' global perspective and to give a brief introduction of how sustainable tourism is practised in different parts of the world. Teacher should ensure that every student could acquire a brief but complete understanding of how tourism development impact different localities and different people in the world. On the other hand, in-depth study of one or more of the specific examples on sustainable tourism development is considered more suitable to students who are more able and who have shown strong interest in this topic. Teachers should note that each specific example represented a specific type of sustainable tourism successfully implemented at a particular type of tourist destination. To enable these brighter students to apply what they have learnt, teachers can introduce an extended activity that requires students to modify a travel itinerary of a guided tour to make the trip more cultural and/or environmental-friendly.

Suggested Time: 8-10 hours

Guiding Questions	• Why is our airport so crowded during major holidays? - What is recreation? Why is it important? - What are the peak seasons of Hong Kong people travelling aboard? - Why do so many Hong Kong people travel aboard? • Are tourists friends or foes to the local people? - What kinds of benefits will tourists bring to the host regions? - What are the negative impacts of tourism on the host regions? • Will Hong Kong enjoy the same benefits and face the same challenges? - Why are the Geopark and Heritage Trails attractive to tourists? - What will be the positive and negative effects of tourism on the Geopark and Heritage Trails? • Can we develop tourism in a more sustainable way? - What is sustainable tourism? - How can we develop tourism without doing harm to our Geopark and Heritage Trails? - What have been done in other places (e.g. Macau, Thailand, Brazil) to make tourism more sustainable? - How can we as individuals help?
Specific Examples	• China: The Historic Centre of Macau • Asia and the Pacific: Thailand (islands and beaches) • World: Brazil (the Amazon)
Knowledge	• Importance of recreation • Seasonal pattern of Hong Kong people travelling abroad • Reasons for increasing number of Hong Kong people travelling abroad (e.g. increasing leisure time, increasing income, better communication and knowledge of other places) • Economic (e.g. improved income and employment, economic growth) and environmental (e.g. preservation and conservation of the natural environment) benefits tourism brings to the host areas

	• Negative environmental (e.g. pollution, physical deterioration) and socio-cultural (e.g. disturbance of local cultural practices and lifestyles, community problems like crime and alcoholism) impacts of tourism on the host areas • Major geological and coastal features found in the Hong Kong Geopark • A brief introduction of the value of one of the Heritage Trails in Hong Kong • Positive and negative impacts of tourism on the Hong Kong Geopark and Heritage Trails • Measures taken to minimise the negative impacts of tourism on the Hong Kong Geopark and Heritage Trails • The concept of sustainable tourism development • Successful examples of Macau / Thailand / Brazil • Green tourists' code of behaviour
Skills	• Extract information about Hong Kong people travelling abroad from reports, newspapers, magazines and other publications • Use GIS software to measure the length of one of the Heritage Trails / the total area of the Hong Kong Geopark • Find out the local time of the most popular tourist destinations of Hong Kong people • Use longitudes and latitudes to locate the most popular tourist destinations of Hong Kong people in an atlas • Use 4-figure and 6-figure grid references to locate features at Heritage Trails or Geopark • Measure the distances between Hong Kong and the most popular tourist destinations of Hong Kong people • Measure the bearings of the most popular tourist destinations of Hong Kong people on a map • Construct a line graph to show the yearly trend of Hong Kong people travelling abroad • Conduct a simple survey in class/in school to investigate the reasons for spending holidays abroad • Conduct an interview at the Geopark / Heritage Trails to understand why foreign tourists choose to visit these places • Recognise geographic features of the Hong Kong Geopark shown in aerial photos and identify them on a map of the same area
Values and Attitude	• Be aware of the need for and importance of recreation • Appreciate the beauty of the natural environment and the value of heritage sites in Hong Kong and other places • Show concern for the impacts of tourism on the host areas • Develop a sense of wonder and curiosity about different peoples, places and environments • Understand and show respect for the people, culture and environment of other places

Changing Climate, Changing Environments

Climate change has been a pressing issue for people living in the 21st Century and is bound to haunt us for the coming decades. From Kyoto to Copenhagen, the issue has brought together all nations of the world to work on an international cooperation plan for solving the problem. Geographically, the issue is a typical example of the interaction between human activities and the natural environment, illustrating how human beings modify the natural environment and how the natural environment in turn influences human beings. Moreover, through studying the impacts of climate change at various scales and locations, our students can understand better the concepts of spatial association and variation. The study of this module also facilitates the development of skills in reading and interpreting maps, climate graphs, weather charts and statistical data in various forms. Teachers should ensure that every student can master the basic skills of identifying the major patterns and trends from various types of maps, charts, graphs and statistical data. Nonetheless, the prime objective of this module should be on the cultivation of students' values and attitudes towards environmental conservation and sustainable development and on developing them into well-informed, responsible global citizens willing to act for the betterment of our environment. It is very important for teachers to convey the message that though global cooperation is never an easy target to achieve, the effort of each and every individual does count and it is never too late to take action.

A number of specific examples are suggested for teachers to strengthen students' global perspective and their spatial sense. These examples are to be used by the teacher to give a brief introduction of the impact of climate change at different places and resulting human responses to the issue. It is essential for teachers to ensure that every student can get hold of a global picture of the impact of climate change and how people at different places respond to it. If students' ability and interest allow, teachers can add a brief introduction of how the issue affects China on the whole, with particular emphasis on the increasing magnitude and frequency of extreme weather events, like the blizzard that surprisingly stormed South China in 2008. For the more able students, teachers can further extend the lesson to include a more detailed study of the impact of climate change on the Tuvalu and the Poles.

Suggested Time: 8-10 hours

Guiding Questions	• What's happening to our climate? - Is Hong Kong becoming hotter and hotter? Are we going to lose our winters? - Is our visibility becoming poorer and poorer? • What cause our climate to change? - What is the climatic pattern of Hong Kong and South China? - How did the climate of Hong Kong change in the recent decades? - What are the causes of our changing climate? Is our urban development worsening the situation? • What is happening and will happen? - What is the climatic pattern of the world? - How did the global climatic pattern change in recent years? - What are the effects of climate change on different parts of the world? - Who are going to suffer? Who are going to gain for the time being? - What will happen to Hong Kong? • What can we do? - What have been done to deal with climate change? - Why is it so difficult for countries all round the world to work together? - How can we as individuals help? Is it too late to act now?
Specific Examples	• China: Blizzards in China • Asia and the Pacific: Rising sea-level at the Tuvalu • World: Melting ice at the Poles
Knowledge	• General patterns and characteristics of the climate of Hong Kong, China, East Asia and the World • The changing climate of Hong Kong, e.g. increasing average temperature, increasing number of hot nights and very hot days, increasing rainfall with more extreme variability, decreasing visibility and weaker winds, increasing extreme weather events • Causes of changing climate in Hong Kong: increasing carbon emission, impact of the development at Zhujiang Delta Region, local pollution, local urban development

	• Change in the global climatic pattern and climate trend • Impacts of climate change on different parts of the world, e.g. heat wave, extreme rainfall pattern, change in frequency and severity of wild-fire, drought and flooding, rising sea-level, change in ecosystems, disrupting crop yields and food supply, spread of diseases • The impact of climate change on Hong Kong and China on the whole • Measures already taken by China (including Hong Kong) and the other countries in combating climate change • The problem of soliciting international cooperation in combating climate change • Individual actions to help alleviate the problem
Skills	• Read articles from various sources (e.g. newspaper, magazines, web pages, CD-ROM, etc.) to identify issues and problems related to climate change • Measure and record local weather data over a period of time using instruments provided by the school and present the data systematically using ICT (e.g. spreadsheet) and/or GIS software • Use an atlas to find out the climate of a particular place and the major climatic zones of the world • Read simple statistical graph (e.g. broken-line graph) showing long-term climate trend (e.g. global mean annual temperature over a long period of time) • Read a series of satellite images showing an area over a period of time and describe the changing weather conditions of the area • Use GIS to construct a map showing areas in the world most severely affected by the major negative impacts of climate change • Use the Internet to search for the work of non-government organisations and groups in the world on combating climate change
Values and Attitude	• Realise a slight change in climate may have enormous impact on the environment and the way people live • Show concern for the people who are suffering and who will suffer from the impact of climate change • Recognise the difficulties in soliciting international cooperation in combating climate change • Develop a readiness to take action to combat climate change • Be confident in the accumulative effect of individual action in contributing to combat against climate change

Section B: From China to the World — Enquiring regional problems arising from human-environment interactions

Food Problem — Can we feed ourselves?

Farming has long been a foundation to the economy of China. In view of her huge population, the provision of sufficient food to feed her people has long been an important issue in China. This module looks at the location of and the types of farming practised in the major farming regions of China. Moreover, it will examine how physical factors such as temperature, rainfall and relief have affected the distribution of these farming regions. In addition to the major farming types in China, students should know the other major types of farming in the world. Another focus of this module is to engage students to investigate into the farming problem of China and to see how the problem may affect the food supply (mainly wheat and rice) of China. The investigation will concentrate mainly on the physical constraints and the environmental problems that adversely affect the food supply of the country, and on the advantages, limitations and negative impacts of using scientific farming methods as one of the possible solutions to the problem. This module also allows students to develop their fieldwork skills. Although the study is on the farming and food problems of China and other less developed countries (LDCs), a field trip to a local farm or one in the Zhujiang Delta can still help students master the basic concepts of agricultural geography. Students will also have a lot of chances to learn how to read and interpret climatic data, topographic maps, population statistics and data on agricultural productivity and crop yield. In addition, students should be able to acquire a deeper understanding of the present demographic and agricultural conditions of China and develop a stronger interest in knowing more about our mother country. They should also be able to show concern and empathy to those people suffering from malnutrition, food shortage and even famine, and be aware of how lucky they are to be spare from any food problems.

A number of specific examples are suggested to strengthen students' global perspective by enabling them to extend their study of food problem from China to the LDCs. Teachers should ensure that all students, regardless of their ability, should be able to acquire a brief understanding of farming types in China and the world, the food problems in China and LDCs, and the solutions adopted in solving these problems. As for the more able students, teachers can ask their students to conduct an in-depth study of one or more of the specific examples to compare the causes of food problem in the example and in China. The study can also include an evaluation of the feasibility of the solutions, such as using scientific farming methods, adopted to solve the problem.

Suggested time: 10-12 hours

Guiding questions	• Where are the farmlands in China? - Where does our food come from? How many of them are from China? - What is an agricultural region? Where are the major agricultural regions in China? Why are they there? - What types of farming are practised in these regions? What are their major characteristics? - Can these types of farming be found in the other parts of the world? • Can we produce enough food for our growing population? - How many people are there in China? Is the number still increasing in recent years? - What are the major farming problems of China in the context of food supply? - Will there be enough food for our population? • How can the problems be solved? - Can the use of scientific farming methods solve these problems? - What are the limitations and the negative impact of scientific farming methods? - Are there other solutions for these problems? • Do the same problems happen in the other parts of the world? - What is the food problem faced by the less developed countries/regions, e.g. North Korea, Cambodia or Sahel? - Are the causes of the problem the same as those of China? - What are the solutions to the problem?
Specific Examples	• Asia and the Pacific: North Korea and Cambodia • World: Sahel in Africa
Knowledge	• Distribution of major agricultural regions in China (Northwest China / North and Northeast China / South China) and factors affecting their distribution • Major types of farming in China and the world (e.g. intensive rice cultivation, extensive wheat cultivation, pastoral farming, market gardening, horticulture, diary farming, mixed farming) • Trend of population growth in China

	• Major farming problems of China, e.g. loss of cultivated land, soil erosion, water shortage, environmental pollution, natural hazard, low level of technology and mechanization, and their impact on food supply • Scientific farming methods and their improvement of agricultural productivity • The limitations and negative impact of scientific farming methods • Other solutions for the farming problems in China, e.g. soil conservation, better land use management, farming specialization • Causes of food problems in the LDCs - including extreme climates, natural disasters, water shortage, poor governance, unstable social conditions, wars, racial conflicts • Solutions to the food problem in LDCs such as the use of scientific farming methods, education given to farmers, birth control, international aids
Skills	• Measure area of fields / farms on a map • Interpret relief and climatic map to look at the physical settings of China • Use GIS to relate the physical factors affecting agriculture and the major agricultural regions in China • Conduct a field trip to a farm in Hong Kong or the Zhujiang Delta to identify the types of farming system and their characteristics by observation and interviewing farmers. • Identify the type of farming by looking at a farm plan or aerial photographs • Construct and interpret pie chart / bar graph showing the productivity of various food crops and the area of farmland in China • Construct and interpret line graph showing the trend of population growth in China
Values and Attitude	• Show interest in knowing more about the farming types in China and other parts of the world • Be aware of the food problem and develop a habit of not wasting any food • Be aware of the limitation of technology in solving food problem • Show concern and develop empathy about the difficulties encountered by people in other areas

The Trouble of Water — Too much and too Little

With a total area of about 9.6 million km², China is one of the largest countries in the world. Variations in relief, climatic and hydrological conditions are obvious in different parts of China. These physical variations, associated with large population size, uneven distribution of population and rapid economic growth, create various water problems in China. Through the study of this module, students can understand how the interplay of physical and human factors has led to floods and droughts in China. They will also understand the role of water pollution in aggravating the water shortage problem in China. In addition, the study of this module facilitates the development of various geographical skills, like reading and interpreting climatic graphs, contour maps and calculating slope gradient. This module also provides an excellent opportunity for students to prepare overlays of different geographical information of China to create an integrated GIS map for further analysis. Last but not least, this module provides a platform for students to know more about the physical environment and water problems of China, which in turn helps our students develop a sense of belonging to our nation. They will develop an eagerness to know more about China and show concern for the problems that China is facing.

A number of specific examples are chosen to broaden students' global perspective and enable them to have a better understanding of the water problem in other parts of the world and the various solutions adopted in different places to solve the problem. If students' ability and interest allow, teachers can add a case study on how Singaporeans solve their water scarcity problem by various advanced technologies (e.g. using recycled water (NEWater) and desalinated water) and integrated water management strategies. Singapore's expertise in managing its water challenge is a good example for our reference. For more able students, teachers can further extend the lesson to include case studies of water problems in Bangladesh and UK, and understand the differences in water management between the less developed countries and more developed countries.

Suggested Time: 10-12 hours

Guiding Questions	• How do water problems affect us? - What are the major threats to the global water supply? - What are the major water problems in China? - Where do these water problems occur in China? Is there a spatial pattern of flooding and drought in China? - What are the impacts of flooding and drought on China? - How does serious water pollution in China aggravate the water shortage problem of China? • From where does water come? - What is a water cycle? How does it operate? - Where are the major rivers in China? - What's wrong with the water cycle of China in the past few decades? • Is the nature to blame? - Where are the wet regions and dry regions in China? Why are they distributed in such patterns? - How are flooding and drought in China related to its physical environment? - What are the impacts of population growth and rapid economic development on the spatial distribution of flooding, drought and water pollution in China? • What can be done to solve the water problems? - What are the measures adopted to alleviate water problems in China? - Can the Three Gorges Dam Project and the South-North Water Transfer Project help solve the problems? Are we doing the right things? - What can we learn from the water management experience of other countries (e.g. Singapore, Bangladesh and UK)?
Specific Examples	• Asia and the Pacific: Singapore and Bangladesh • World: United Kingdom
Knowledge	• Pattern of global water supply and the major areas with water problems • Major water problems in China, including flooding, drought and water pollution

	• Major rivers in China • Distribution patterns of flooding and drought in China and their impacts • Water pollution in China: causes and impacts • Operation of water cycle • General relief and climate of China and the distribution of wet and dry regions • Causes of flooding and drought in China • Measures for solving water problems in China (including the Three Gorges Dam Project and the South-North Water Transfer Project) • Water conservation and water management strategies in China and other parts of the world
Skills	• Collect information on China's water problems (including flooding, drought and water pollution) from various sources and summarise the information in tabular form • Find the height of a ground from a contour map and calculate slope gradient • Read, interpret and construct climatic graphs of major cities of China • Use an atlas to find out and locate the major river basins in China and the world • Construct a cross-section of the river channel at the lower course of a major river with the aid of GIS software • Prepare overlays of different types of geographical information of China (e.g. relief and urbanisation) to create an integrated GIS map for understanding / interpreting water problems in China • Construct a pie chart to represent the distribution of planetary water by percentage • Construct a flow diagram to illustrate the operation of a water cycle • Compare photographs showing an area before and after flooding / drought, and describe the impact of flooding / drought on the area
Values and Attitude	• Appreciate the importance of sustainable development and develop a sense of responsibility for resource conservation • Be aware of and show concern for water resources and environmental problems of China and develop an eagerness to know more about China • Develop a sense of belonging to our nation and become active and responsible citizens working for her betterment • Appreciate the interdependence between human beings and the natural environment • Express empathy towards the problems and difficulties encountered by other people in different parts of the world

Population Problems — Just about numbers?

Population is a popular topic in geography. It facilitates students to master concepts related to the interactions between human and the environment, and the interrelationship between space, people and places. It is essential for students to have a thorough understanding of the physical and human characteristics of a place before they can explain the population characteristics of that place. This module focuses on the study of the population characteristics and issues of China, including the problems of overpopulation and uneven population distribution encountered, and the solutions adopted by the Chinese government in dealing with these problems. Through the study of this module, students can gain some basic understanding of the major physical and socio-economic attributes of their mother country in order to examine the population issues of China. For skills development, students will be given ample opportunities to familiarise themselves with reading, organising, presenting and analysing population data in both graphical and statistical forms. They should also be taught to read and construct population pyramid and be introduced to Demographic Transition Model. In all, the most important learning outcomes of this module should be the cultivation of students' awareness of the seriousness of population problems and their enormous impact on China as well as other places in the world. In fact, population issue is closely related to the poverty problem, which in most cases is the source of all other socio-economic problems encountered by human being. It is expected that through the study of this module, students can show more concern for the suffering of people living in different places in China and the world, and can fully aware of the interconnectedness of global issues.

All students studying this module should be able to describe the global population characteristics and distribution pattern, as well as be able to identify the major factors that affect population distribution. Moreover, they should be able to identify the causes and characteristics of the major population problems, including overpopulation, uneven population distribution and ageing population, and understand the measures adopted by China and other countries in dealing with the problems. For the more able students, teachers can consider asking them to conduct a more in-depth study of the population problems in one of the specific examples. Alternatively, they can conduct a comparison study of the population policy of China with that of another country which adopted a non-birth control strategy. For the brightest students, teachers can further extend the study, pending the availability of time and the interest of their students, to examine population movement in China or in a Western European country like Germany.

Suggested Time: 8-10 hours

Guiding Questions	• Are there too many people in China? - How many people are there in China? - What are the characteristics of the population of China? - What is the population growth pattern of China? • Can China support so many people? - What is overpopulation? - What problems will overpopulation bring? - Is China overpopulated? What have China done to deal with the problem? • What are the implications with China's population distribution pattern? - What is the distribution pattern of China's population? - Why is the population of China distributed in such a way? - What are the problems arising from such a distribution pattern? - What can be done to alleviate such problems? • Do other countries suffer from the same problem? - What is happening to the world population? - Are the population problems of the more developed countries the same as those of the less developed countries? - Why do some countries have negative population growth? What are the problems caused by population ageing? - How can these problems be solved?
Specific Examples	• Asia and the Pacific: Japan and India • World: Germany and Nigeria
Knowledge	• Population of China: size, structure, growth pattern and changes over time • Factors controlling population growth (e.g. health care, food supply, government policy, culture and tradition, status of women, income and family status, education level) • Definition of overpopulation

	• Strategies adopted by the Chinese government to alleviate overpopulation problems • Population distribution pattern of China and the major factors affecting population distribution • Reasons for the uneven distribution of the population in China • Population problems in the coastal and interior regions of China • Measures adopted by the Chinese government to deal with the problem of uneven population distribution • The population pattern and characteristics of the world • Differences in the population structure of the more developed and the less developed countries • Major population problems in the more developed and the less developed countries • Definition of ageing population and problems associated with ageing population • Solutions adopted by different governments in solving population problems (including overpopulation, uneven population distribution and ageing population)
Skills	• Search and read topographic and thematic maps from an atlas to understand the major factors affecting the population distribution of China • Use GIS to construct a choropleth map showing the population density pattern of China • Construct a population pyramid • Interpret population pyramids to identify the population structure in different parts of the world • Identify the major characteristics of the population structure of a country from population data presented graphically and statistically • Calculate and interpret growth rates and dependency ratios • Read the population and economic data of different countries and classify them into the five stages of the Demographic Transition Model
Values and Attitude	• Understand the seriousness of population problems as an important issue of China and the world • Show concern for the people suffering from different population problems • Be aware of fallacies in population issues • Understand the fact that people of different places respond differently to population problems owing to different beliefs, cultures and experiences

Taming the Sand — A long-lasting combat against desertification and sandstorms

Deserts cover nearly one-third of the total land surface of the Earth and are growing continuously by encroaching land at their margins. This process of desert encroachment, which is a type of desertification, poses a serious threat to the survival of the already improvised people living at the desert margins. Deserts and desertified land cover about 25% of China's territory. It is therefore a common landscape to most Chinese, especially the inhabitants of North China. Frequent occurrence of sandstorms in this part of China manifests serious desertification and accelerated soil erosion in this part of China. Through the study of this module, students can have a deeper understanding of the causes and impact of desertification (the main focus is on desert encroachment) and sandstorms in North China, as well as the measures to tame the spreading sand. Besides, this module provides various skill-training opportunities to students, e.g. describing a distribution pattern on a map, interpreting satellite images, conducting a geographical enquiry in the field and using GIS for geographical analysis. By learning the spreading sand problems of China, students may also develop a sense of belonging to our nation, appreciate the importance of sustainable development and be willing to take appropriate actions for a better environment.

A number of specific examples are chosen to broaden students' global perspective and enable them to have a better understanding of what is happening in other parts of the world. Teachers should provide all students with a brief introduction of the global pattern of desertification, major regions affected by sandstorms and the measures taken by them to alleviate the problems. For more able students, teachers can further extend the lesson to include more in-depth case studies of how the spreading of desert dust and sand affects the inhabitants of Australia (especially dwellers of large cities, like Sydney and Brisbane) and the Sahara. They can also study the similarities and differences on how less developed countries and more developed countries manage their sand problems.

Suggested Time: 10-12 hours

Guiding Questions	• How does spreading desert dust and sand affect us? - What and where are deserts? - What is desertification? Where are the major desertified areas in the world? - What is sandstorm (or dust storm)? What is the global distribution pattern of such dust-bearing wind? - Where can we find the major sources of sand in China? What are the major tracks of sandstorms affecting China? - How do desertification and sandstorms affect the people of China? Can sandstorms do us some good? • Is the nature to blame? - What are the characteristics of the physical environment of North China? - How do physical factors and human activities lead to desertification in this part of China? - What are the major causes of frequent occurrence of sandstorms in China? - What are the relationships between desertification and frequent occurrence of sandstorms in North China? • What can be done to solve the spreading sand problems? - What are the measures for alleviating the negative impact of desertification and sandstorms in China? - What can we learn from the experience of other countries / regions in the world (e.g. Australia and the Sahara)? - What are the major similarities and differences between the strategies adopted in less developed and more developed countries?
Specific Examples	• Asia and the Pacific: Australia • World: The Sahara
Knowledge	• Global distribution of tropical and temperate deserts • Brief introduction of the characteristics of desert landscape (including climate and major types of deserts) • Simple definition of sandstorms (dust storms) and desertification (e.g. desert encroachment, pasture degradation, soil erosion, salinization and degradation of vegetation cover) • Global distribution pattern of regions affected by desertification and sandstorms • Origin of sandstorms in China and their major tracks in China • Impacts of sandstorms and desertification

	• Characteristics of the physical environment of North China • Characteristics of desertification and sandstorms in North China • Causes of desertification and sandstorms in North China • Relationships between desertification and sandstorms • Measures for alleviating the negative impact of desertification and sandstorms • Similarities and differences between the strategies adopted in less developed and more developed countries
Skills	• Describe the global distribution of deserts and areas affected by desertification on a map • Read and interpret climatic graph and data to summarise the major climatic characteristics of desert regions • Identify major desert landform features in desert regions from photos • Acquire information from various sources to explain how human activities lead to or speed up desertification • Use appropriate types of maps/charts/graphs to illustrate the different rates of desertification in different areas • Measure the distance of the route of a sandstorm on a map using linear scale / RF • Interpret satellite images showing tracks of sandstorms in different parts of the world • Compare photographs showing an area before and after the occurrence of a sandstorm and describe the impact of sandstorm on the area • Construct a line / bar graph to show the changing frequency of sandstorm days in a Chinese city, e.g. Beijing • Use GIS software to construct a map showing the source and route of a sandstorm, e.g. the Australian dust storm in 2009 • Visit the Dry Plant House of the Conservatory of the Hong Kong Park to observe the simulated arid environment and the characteristics of desert vegetation • Conduct fieldwork in and outside a woodland and evaluate the effectiveness of planting trees in reducing level of soil erosion
Values and Attitude	• Be aware and show concern for the spreading sand problems of China, and develop a sense of belonging to our nation and an eagerness to know more about China • Be aware of the changing environment and its possible impacts on human activities • Express empathy towards the problems and difficulties encountered by other people in different parts of the world • Appreciate the importance of sustainable development and develop a willingness to take appropriate actions for a better environment

Section C: Challenges for our world — Managing global issues in a sustainable way

Global Shift of Manufacturing Industry — Opportunities and threats

Stepping into the 21st Century, globalisation affects nearly every aspect of our life. The manufacturing sector experienced a major re-organisation of corporation structure and function as well as a relocation of factories and plants as manufacturing industry becomes increasingly globalised. This provides a good opportunity for student to understand where we can find manufacturing industry, why they are there and how industrial location changes over time. This module aims at helping students acquire an overview of the global location of manufacturing industry and to understand the global shift in industrial functions and locational pattern. In addition to mastering basic geographical concepts including "spatial interaction", "location and distribution", "regions", "sustainable development", students should be able to understand briefly how the global shift of manufacturing industry results in the emergence of various issues in the more developed and the less developed countries. This module also enables students to develop their ability in reading and interpreting spatial and statistical data, and in displaying the geographical patterns, trends and spatial variations included in these data using appropriate graphical and cartographic methods. In completing the study of this module, students should be aware of the development gap that exists between the more developed and the less developed countries, and appreciate that the global shift of manufacturing industry can both close and widen this gap.

Teachers should note that all students should be provided with a brief introduction of the global manufacturing activities, in particular the location pattern of the major industrial belts and the general factors affecting industrial location and development. Depending on the availability of time and students' ability, teachers can choose to go over briefly one or more of the specific examples to help students understand the benefits and challenges brought to the 'richer' and the 'poorer' countries by the global shift of manufacturing industry. For the more able students, teachers can make use of the specific examples to conduct a more in-depth study of the change in locational pattern as well as the issues created by the global shift of manufacturing industry, including solutions that can be adopted to solve the problems. Teachers can also ask their students to discuss how manufacturing industry in the case study can be developed in a more sustainable way. They can further challenge their students by asking them to suggest how the Hong Kong government can attract manufacturing industry to come back to Hong Kong.

Suggested Time: 8-10 hours

Guiding Questions	• Where have our factories gone? - What types of industries have left Hong Kong? - Where were they located in the past and where are they now? - Why did these industries leave Hong Kong? • Do other places in the world face the same problem? - Where are the major industrial belts in the world? Why are they there? - What is the general pattern of the global shift in industrial location in recent years? - What is a transnational cooperation (TNC)? What is the role of TNCs in the changing global locations of industrial functions? • What are the pros and cons of the global shift of manufacturing industry? - What opportunities does the global shift of manufacturing industry bring? - What are the challenges created by such a trend? • Can industrial development be appropriate and sustainable? - How can the challenges created by the global shift of manufacturing industry be handled? - What are the sustainable measures adopted / to be adopted by different countries to manage industrial change?
Specific Examples	Changing industrial location and functions in: • Guangdong, China • The United Kingdom • The Great Lakes Region, U.S.A.
Knowledge	• Major types of Hong Kong industries • Relocation of Hong Kong industries: where and why • Major industrial belts in the world • Factors affecting industrial location • The global shift in manufacturing as a result of changing industrial location factors, including increased mobility and interdependence, advancement of technology (including ICT), changing markets, relative labour costs, political influences, rising importance of research and development work, etc.

	• Major characteristics of transnational corporations • Benefits of the global shift of manufacturing industry to more developed and less developed countries • Problems caused by industrial relocation, industrial decline and changes in industrial structure • Measures to alleviate the problems caused by the global shift of manufacturing industry • Sustainable strategies to manage the impacts of industrial change
Skills	• Extract information of manufacturing industry from a variety of sources, including GIS data, websites, newspaper articles, reports, tables, quotes, etc. • Use appropriate techniques (e.g. descriptive statistics) to summarise data on the level of development of different industrial regions • Construct a system diagram showing the traditional and new factors that influence the location of manufacturing industry • Use an atlas to locate the major industrial regions of the world • Conduct a land use survey to record the changing land use pattern of an old industrial district in Hong Kong as a result of industrial relocation and use GIS software to plot a land use map showing the pattern • Plan a simple questionnaire survey to collect information about the impact of industrial decline in an old industrial district in Hong Kong • Construct appropriate graphs (e.g. pie chart) to display changes in employment structure in a declining industrial region
Values and Attitude	• Show concern for the impact of industrial development on both the physical and the human environment • Realise the close relationship between Hong Kong and the rest of China • Recognise the trend and impact of globalisation • Be aware of the interconnectedness and interdependence between places • Express empathy towards the people who are in less privileged conditions owing to globalisation

Scramble for Energy

The demand for energy is expected to increase in the 21st Century with the rapid development of the newly industrialised countries, mainly the BRICs (Brazil, Russia, India and China). To satisfy the enormous energy demand for manufacturing, economic growth, transportation and domestic use is inevitably a challenge to every country in the world. The focus of this module is to study the spatial pattern of energy production and consumption and to understand the uneven distribution between the more developed countries (MDCs) and the less developed countries (LDCs). Students should also be able to identify the major types of renewable and non-renewable energy resources of the world and to describe the costs and benefits of using these two different types of energy resources. Moreover, they should gain a basic understanding of the energy problems the MDCs and LDCs are facing, and different measures taken to alleviate the problems. It is important for teachers to ensure that their students will be able to come across the new approaches developed for energy supply and have sufficient opportunities to discuss how our increasing energy demand can be met sustainably. In terms of skills development, this module enables students to make use of a wide range of statistical methods, graphs and maps to present, organise and analyse different types of energy data. Teachers can also consider organising a field trip to an energy plant in Hong Kong or South China to provide students with first-hand information and real life experience. Last but not least, besides being informed and responsible global citizens, it is also important for students to be aware of the need to change our lifestyles and habits of energy consumption to be successful in combating energy problem. Students should also understand that the development gaps between different countries/regions result in variations in people's perceptions towards the energy problem and in turn help to explain why different solutions are adopted in different places to combat the problem.

For average students, teachers should concentrate mainly on the provision of a general picture of the global energy production and consumption pattern, the major types of energy resources, the pros and cons of using renewable and non-renewable resources, as well as the major similarities and differences between the solutions adopted in the more developed and the less developed countries. For those students who are more able and more interested in energy issue, teachers can consider introducing an additional study on the development of an alternate energy resource chosen from the specific examples. Students should be guided to conduct a more in-depth study of the costs and benefits of that energy resource, and how the development of new energy technology in that particular country will increase the opportunity to move towards a more sustainable energy future.

Suggested Time: 8-10 hours

Guiding Questions	• Why do we have to struggle for energy resources? - What are the major types of energy resources of the world? Where can they be found? - What are the global pattern of energy production and consumption? - Why is there an uneven share of energy resources between the more developed and less developed countries? - What is the implication of the uneven pattern of energy production and consumption? • What are the other problems with the current energy resources? - What are the environmental problems caused by our current exploitation and use of fossil fuels? - Why is the use of fuel wood in less developed regions (e.g. South Asia, Southern and Eastern Africa) a threat to people and the environment? - What are the costs and benefits of our current use of renewable energy? • What alternatives do we have? - What do we mean by renewable and non-renewable energy resources? - What are the advantages of using renewable energy resources? What are their limitations? - Is nuclear power a possible way out? • How can future energy demand be met in a more sustainable way? - What have done and can be done in Hong Kong to deal with the energy problems? - What are the possible national and global solutions for energy problems of the world? - What can we do at home and at school? Can individual effort help?
Specific Examples	• Wind farm in U.K. • Hydroelectric power in China • Biofuel in Brazil
Knowledge	• Major types of energy resources of the world: renewable and non-renewable resources • Global pattern of energy production and consumption, related economic and political conflicts induced by such pattern • Costs and benefits of using non-renewable energy, in particular the use of fossil fuels and fuel wood

	• Advantages and limitations of renewable energy • Major similarities and differences between the energy problems of the more developed and the less developed countries • The pros and cons of using nuclear power and its increasing role in future energy supply • Local, national and global solutions for energy problem of the world, including reducing the demand for energy, more efficient use of energy, developments in new energy-saving and renewable energy technology, new building design and techniques, adoption of more energy-efficient systems (e.g. mass transit system) • Individual actions in saving and conserving energy, e.g. reducing the use of energy effectively, and changing lifestyle and consumption pattern
Skills	• Identify the specific energy problems of a country from a pool of information and develop enquiry steps to sort out possible solutions to the problems • Summarise the main arguments for and against nuclear power in tabular format • Construct pie charts to display the proportion of each major types of energy resources account for the total energy production of a country • Construct a flow map to illustrate the movement of petroleum around the world • Construct a divided bar graph to show the changing proportion of the production of different types of energy within a period of time • Use GIS to insert proportional symbols (proportional bars / circles) on a world map to indicate the different types of energy consumption in different continents/regions of the world • Conduct a questionnaire survey in school / in local community to collect opinions on the construction of nuclear power plants in Guangdong • Based on map and photo evidence, describe the environmental consequences of the exploitation of fossil fuels (e.g. coal, petroleum)
Values and Attitude	• Develop a sense of responsibility for energy conservation • Appreciate the need to change one's own lifestyle and habits in saving energy • Show concern for the energy problems that confront China • Understand why people in different places respond differently to the energy issue • Be aware of the limitation of individual action in solving energy problems and understand that it requires a combination of different solutions to handle global issues like the energy problem

The Geography of Disease — Facing a spreading risk

The devastation of SARS, Avian Flu and the most recent Swine Flu makes the inclusion of the study of infectious diseases in the local geography curriculum beyond doubt. With the increasing degree of globalisation, the spread of infectious diseases ignores boundaries and in principal affects everyone. Geography contributes to the spatial understanding of this spreading risk and enables students to place their learning in the context of real lives. The study of infectious diseases in the context of geography does not require the mastery of advanced knowledge in medical science or pathology. The focus of study is on the distribution and spread of disease, responses and risk-taking behaviours of people living in different infected areas, as well as the appropriate methods of control at local, national and international scales. Moreover, through mapping of the outbreak and the spread of infectious diseases, students can learn how to identify patterns, linkages and relationships, in addition to the development of a variety of map construction and interpretation skills as well as the sensitivity to the meanings behind statistical data. These basic geographical skills can help our students to make informed decisions about health risk and management of personal hygiene, which is the very essential first step in reducing the increasing threat of infectious diseases. This study also cultivates students' empathy towards people suffering from infectious diseases and encourages them to appreciate how we are all connected personally and in our community to wider global issues. The most important development in students' values and attitudes should be the examination and reflection of every individual's responsibility to engage in concerted action for the betterment of our world.

For average students, teachers can focus the study on one infectious disease. No matter what the choice may be, it is essential for teachers to remind all students to note the variations in the spread and the impact of different infectious diseases in different places, especially in the more developed and the less developed countries. For the more able students, teachers can further encourage them to examine why children and the less developed regions are more vulnerable to infectious diseases. Another interesting focus for further enquiry can be on the study of the reasons why some infectious diseases tend to spread faster and wider in the more developed regions. For the brightest students, a comparison study of the spread, distribution and impact of two different infectious diseases can be a challenge to stretch their potential. Students can also be prompted to think about the role of geography in addressing this global issue.

Suggested Time: 10-12 hours

Guiding Questions	• Why do so many of us get sick at the same time? - What do we mean by infectious diseases? What are their characteristics? - What are the most prominent infectious diseases of the world? - How many of them are found in Hong Kong? • How does the disease spread? - What was the origin of the latest outbreak of the disease chosen for this study? - What was the spreading pattern of the disease in its latest outbreak? - Why did the disease spread in that way? - Does this spreading pattern make Hong Kong more vulnerable than the other places? Why is it so? • Why do the risk and impact of infectious diseases vary in different places? - What are the global outbreak and death patterns of the disease chosen for this study? - What about other more prominent infectious diseases? Are the patterns similar? Why is it so? - Why do most of the deaths from infectious diseases occur in the less developed countries? • Are we safe? If not, what can we do? - What can we do to prevent the spread of infectious diseases to and in Hong Kong? - Why should we care and be concerned of those people seriously affected by infectious diseases? - How can we help?
Specific Examples	• Influenza (e.g. Swine Flu, Avian Flu) • AIDS • Tuberculosis
Knowledge	• The definition of infectious diseases and their common characteristics • The most prominent infectious diseases of the world and those that can be found in Hong Kong • The spread and distribution of the infectious disease chosen for this study and its impacts on individuals and societies • The response and risk-taking behaviours of people at different infected areas (Hong Kong included)

	• The control measures of the infectious disease chosen for this study adopted by Hong Kong and other places • The limitation of the control measures in efficacy owing to costs and other issues (e.g. maladministration) • Management of personal hygiene to reduce the threat of infection • The similarities and differences in the patterns of spread and distribution of the most prominent infectious diseases of the world • The reasons for the variations in the spread, distribution and impacts of infectious diseases in different places and on different age groups • The relationship between globalisation, transport network and spread of infectious diseases
Skills	• Plan how to locate appropriate information and data concerning the spread and distribution of infectious diseases • Observe and interpret from maps and statistical data the geographical patterns, trends and relationships related to the spread and distribution of infectious diseases • Draw conclusion on the major factors controlling the spread and distribution of infectious diseases from analysed geographical data • Use GIS software to construct a digital map showing the tracking of infectious diseases • Read and interpret climatic graphs of different places to identify the relation between climate and the spread and distribution of infectious diseases • Construct a choropleth map to highlight different levels of economic development in different parts of the world and identify the relationship between economic development and infectious diseases by comparing the map with the global spread pattern of infectious diseases • Use appropriate graphical method (e.g. scatter diagram, bar graph) to indicate the relationship between age groups and infectious diseases • Use digital, interactive mapping tools available on the Internet (e.g. Google, WorldMapper) to display spatial data and patterns related to infectious diseases
Values and Attitude	• Be aware of the changing global environment owing to rapid globalisation and its possible impact on the spread of infectious diseases • Show concern for the devastation of infectious diseases on our society, our nation and our world • Appreciate that people at different places have different perceptions towards infectious diseases and that these differences may influence their responses to the issue

Oceans in Trouble

Oceans cover about 70% of the surface of the Earth and have enormous impact on our weather and climate, water cycle, landform, food and resources supply, transport, trade and economic development. In regard of the importance of oceans and seas and their close connection to our life, it is important for our students to know more about these water bodies. The purpose of this module is to enable students to know what and where the major oceans and seas in the world are and to gain a fundamental understanding of our oceans and their importance. Moreover, students are expected to understand better the problems created by human activities in our oceans and the negative impacts of these problems. The concept of resource management can be understood by discussing how we should make use of our ocean resources in a sustainable way. For skills development, by looking at the distribution of major oceans and seas and ocean resources, students can develop the basic geographical skills such as locating places and reading longitudes and latitudes. The module also enables students to interpret different graphs, charts and statistical data. Although the focus of this module is on a global level, local visits or field trips can be organised to look at the marine resources of Hong Kong, the kinds of negative effects we have produced and the kinds of remedial measures we have adopted to protect our marine environment. Through studying this module, students should be able to develop the sense of appreciation of the natural beauty of oceans and to be aware of the need to conserve and maintain our marine resources through individual effort and international co-operation.

Teachers should ensure that all students should have an overview of the global distribution of ocean resources, especially the fishing, energy and mineral resources. To enhance students' global perspective, teachers should select appropriate examples from different parts of the world to facilitate students to understand how and why people have damaged our oceans and what measures we should adopt to protect our oceans. It is advisable for teachers to make use of South China Sea as an example to illustrate the problems associated with overfishing and exploitation of oil and natural gas owing to its proximity to Hong Kong. Teachers can consider using the other two more distant examples of North Sea and Mediterranean Sea to supplement the study for students with better ability and greater interest in this topic. They can challenge their better students by asking them to compare the different measures adopted by different countries in maintaining a sustainable development of ocean resources. Teachers can also consider introducing an in-depth study on a particular issue related to ocean resources, such as the conflict over fishing territories in North Sea or the conflict over exploitation of natural gas in East China Sea.

Suggested Time: 8-10 hours

Guiding questions	• How do the oceans support life on earth? - What are 'oceans'? What are 'seas'? - Where are the major oceans and seas? - What is a marine ecosystem? Why is it important to us? • How do human make use of the oceans? - What are the major types of ocean resources? Where can they be found? - How are these resources being used by human? - What other functions do oceans provide for human? • What are the problems affecting our oceans? - What is overfishing? What effects does it have? - How are the seas polluted? Where does most marine pollution come from? - What are the consequences of marine pollution? • What can be done to save our oceans? - How can our 'ocean' problems be solved? - Why is international cooperation so crucial in solving the problems? - What have been done in Hong Kong?
Specific examples	• South China Sea • North Sea • Mediterranean Sea
Knowledge	• Distinction between oceans and seas • Distribution of major oceans (including Pacific Ocean, Atlantic Ocean, India Ocean, Arctic Ocean) and seas (e.g. Bering Sea, Black Sea, Caribbean Sea, Red Sea) • A brief introduction of an ecosystem: inputs, outputs, processes, energy flow, nutrient cycling, food chain • Oceans as a marine ecosystem and its importance of maintaining the survival and well-being of human

	• Major types of ocean resources, including food (fish and other seafood), power (oil, natural gas, wind and tidal power) and minerals, and their distribution pattern • Human use of ocean, e.g. for trade and transport, for recreation and for waste treatment • Definition of overfishing • The effect of overfishing on the marine ecosystem and human being with reference to specific places, e.g. South China Sea, North Sea and Mediterranean Sea • Sources of marine pollution such as sewage discharge, oil spills and sea transport • Consequences of marine pollution • Measures to reduce the negative effects of human use of oceans • Possible ways of exploiting and managing ocean resources in a more sustainable ways • International effort and cooperation to save oceans, and the difficulties encountered
Skills	• Use an atlas to find out the major oceans and seas in the world • Describe the distribution pattern of ocean resources shown in thematic maps • Read and interpret graphs, charts or statistical data showing the production and consumption of ocean resources • Collect information about the negative effects of human use of oceans from a variety of sources • Use the Internet to search for information about the work done by international or non-government organizations in conserving ocean resources and tackling marine problems • Conduct a visit to a local marine conservancy or a related resource centre (e.g. the Jockey Club HSBC WWF Hong Kong Hoi Ha Marine Life Centre or the Ocean Park Academy Hong Kong) to understand the marine ecology in Hong Kong • Record and observe in the field the impact of human activities on the marine environment of Hong Kong's surrounding waters • Use satellite images to trace the spread of oil spills (e.g. the Mediterranean Sea)
Values and Attitude	• Appreciate the natural beauty of oceans and seas • Develop a sense of responsibility towards conservation of ocean resources • Be aware of the need for international co-operation in tackling the issue of exploiting ocean resources • Deepen the understanding of the meaning of sustainable development

Chapter 3 Curriculum Planning

This chapter provides guidelines to help schools and teachers to develop a flexible and balanced curriculum that suits the needs, interests and abilities of their students, and the context of their school.

3.1 Guiding Principles

Teachers are encouraged to plan and develop a balanced and coherent curriculum that will enable students to take an active role in geographical enquiry. The following are some major curriculum planning principles for teachers' reference:

(a) The primary considerations teachers need to take into account throughout planning are: the curriculum rationale, students' needs, the school context and the characteristics of the discipline of geography.

(b) Planning should be based on what students have already achieved in basic education. This prior knowledge and experience should determine the level at which modules are taught in the first months of the junior secondary education.

(c) It is important to help students to master the key geographical concepts and ideas that are essential for understanding other concepts and ideas in the first months of the junior secondary education.

(d) Curriculum modules should be sequenced so that earlier work lays the foundations for later study.

(e) The programme should provide sufficient challenge for students of different abilities.

(f) The programme should provide a coherent learning experience of geography for students who will continue to study the subject at senior secondary level as well as those who will not take geography in S4-6.

3.2 Planning Strategies

Based on the above guiding principles, planning for the junior secondary geography should focus on (a) making learning more meaningful, (b) developing the curriculum in a logical sequence to ensure a smooth interface between primary, junior secondary and senior secondary education, and (c) catering for students with different learning abilities and inclinations. The adoption of an enquiry approach and the incorporation of geographical issues and problems into this curriculum aim to fulfil all these considerations.

3.2.1 Making learning more meaningful

One possible way of making learning more meaningful is to connect students' learning to their life experiences, and help them to derive meaning from them. To achieve this, teachers are advised to draw on students' experience of the real world and connect what they have learnt in the classroom with their daily life. In short, that means the promotion of "learning in life" and "learning for life", which is one of the key purposes of adopting an enquiry approach and incorporating geographical issues and problems into this curriculum.

In addition to the provision of real-life contexts which make the learning of geographical concepts and knowledge more meaningful for students, enquiry approach also offers more opportunities for the cultivation of positive values and attitudes, and the development of a global perspective and civic awareness. It facilitates the development of students' geographical competencies, generic skills and general intellectual capacity better than other curriculum approaches. Its greater flexibility and stronger social relevance also help to cater for a wider range of students with more diverse abilities, interests and needs.

3.2.2 Interface with primary and senior secondary education

Geography is a new subject to most students first entering the junior secondary level. However, students should have acquired some preliminary concepts relating to geography in their primary education. Therefore, teachers should ensure continuity in the learning experiences of the students. Continuity can be summarised as a feature of course design which:

- maps out and links students' experiences;
- enables students to build on previous experiences and learning; and
- helps students acquire and develop geographical knowledge, understanding and skills, as well as values in a structured way.

In their primary education, in particular the study of General Studies, students should have acquired some basic concepts relating to geography, such as conservation, people and environment, interdependence of living things and their environment, etc. Most of these concepts are included in Strand 2 of the Primary General Studies curriculum. Junior secondary geography teachers can plan their S1-3 curriculum based on this foundation knowledge. On the other hand, teachers should note that the S1-3 Geography curriculum shares the responsibility of preparing students to study geography in the senior secondary level. To provide a smooth interface, the curriculum should:

- cover the essential learning elements (refer to Section 2.5);
- adopt the enquiry approach in learning and teaching;
- emphasise the development of the core skills; and
- stress the nurturing of positive values and attitudes.

3.2.3 Catering for learner diversity

Since every learner has his/her own unique style of learning, there will always be variations in the ways students learn, the speed of learning, what they find difficult, and their level of attainment. Curriculum planning can be one of the interventions that help all students to maximise their potential. The following are principles that should be considered in planning the junior secondary Geography curriculum to cater for learner diversity:

- Clear learning objectives and learning outcomes in terms of the pupil's knowledge, understanding and skills need to be defined in advance;
- A variety of teaching and learning strategies is required to differentiate the learning experiences of pupils;
- A variety of tasks and activities is required to provide different opportunities for pupil learning and for different outcomes;
- Opportunities which vary in the pace and depth of learning are needed;
- Different strategies for the assessment of pupil learning are to be introduced;
- Effective feedback on the pupils' learning outcomes should be given, and targets for students' future learning should be set.

This curriculum has included in its design possible mechanisms for teachers to cater for learner diversity. Teachers can tailor this curriculum to suit the different needs, abilities, and interest of different classes of students by varying the content, the scope and the depth of teaching. For students who need more intensive care, teachers can reduce the curriculum content to cover only the six core modules. The prime concern should be ensuring every student should have ample opportunity to acquire and master the essential learning elements listed in Section 2.5 of this Guide. For the majority of students, teachers can stick to the original proposal of this Guide to cover 9 modules within 3 years, that is, the 6 core modules and 3 elective modules of their choice. For students with better learning motive and ability, teachers can consider including extra elective modules if teaching time allows. However, teachers should pay careful attention to whether it is really beneficial to their students to study extra modules. In the end, it is the quality and effectiveness of learning, not the number of modules taught, that really matters.

Another possible way of tailoring this curriculum is to reduce or extend the scope of teaching. In view of the ability of students, teachers can limit the scope to the minimum by covering only the Hong Kong cases for modules of Section A, only the China cases for modules of Section B and only one specific example for each of the modules of Section C. The following table summaries different possible variations that can be introduced.

Variations in Scope of Teaching	
For Section A modules	• only the case of Hong Kong • the case of Hong Kong + specific example of China • the case of Hong Kong + specific example of China + specific example of Asia • the case of Hong Kong + specific example of China + specific example of Asia + specific example of the World
For Section B modules	• only the case of China • the case of China + specific example of Asia • the case of China + specific example of Asia + specific example of the World
For Section C modules	• only one specific example • two specific examples • all three specific examples

Teachers can also tailor this curriculum by regulating the depth of teaching. Suggestions on this aspect are provided in the two introductory paragraphs developed for each module. Take the module "Taming the Spreading Sand" as an example, the introductory paragraphs stated that the major foci of this module include:

- Knowledge and understanding
  - global pattern of desertification and major regions affected by sandstorms
  - the causes and impact of desertification and sandstorms in North China
  - the measures to tame the spreading sand
- Skills
  - describing a distribution pattern on a map
  - interpreting satellite images
  - conducting a geographical enquiry in the field
  - using GIS for geographical analysis
- Values and attitudes
  - develop a sense of belonging to our nation
  - appreciate the importance of sustainable development and
  - be willing to take appropriate actions for a better environment

The above are the learning elements that should be acquired by all students. As for the more able students, it is suggested that teachers can include more in-depth case studies of how the spreading of desert dust and sands affects the inhabitants of Australia and the Sahara. They can also guide their students to examine the similarities and differences on how less developed countries and more developed countries manage their spreading sand problems. Teachers are advised to make good use of these introductory paragraphs to tailor the curriculum to suit the abilities, interests and needs of their different classes of students.

3.2.4 Considerations for offering elective modules

Schools are encouraged to offer elective modules that cater for the needs and interest of the students, that provide a smooth progression of study and a strong coherence between the core and the elective modules, as well as that suit the school context including teachers' expertise and the availability of facilities, equipment and other resources. The best strategy will be one that strikes a balance among the above factors.

In selecting the elective modules, teachers should be clear about the purpose and focus of each module, in particular the key concepts and knowledge, skills, values and attitudes that are included, so that the study of the elective modules can supplement what the students have acquired in the core modules to achieve the learning objectives of the curriculum.

Another important consideration would definitely be the interest, the ability and the need of the students. For active learners who favour new ideas and experience and who are more inquisitive in learning, modules like “tourism geography” and “the geography of disease” will be a good choice. For those who need more intensive care from teachers and who will take geography in their senior education, those modules like “climate change” and “desertification”, which have a strong spiral coherence with the senior secondary Geography curriculum and provide more direct and concrete experience, may be more appropriate to these students.

Teachers are reminded that a good curriculum plan should be forward-looking, knowing that our students will be facing challenges which are brand new to us. In addition to providing the basic foundation in knowledge and skills, it is also crucial to enable our students to have the chance to explore the new territory of knowledge and understand new trends of development. This should always be in teachers’ mind when considering which elective modules to offer.

3.2.5 Integrating assessment with learning

Assessment is an integral part of the learning and teaching process. It provides a further opportunity for learning in addition to measuring achievement. Formative assessment provides students with immediate feedback on their performances, as well as indicating their progress to date and helping them to determine the focus of their future studies. Teachers can also make use of these data to make judgment about students’ progress (what the students know, understand and can do) so as to plan for the next stage of students’ learning.

3.3 Curriculum Organization

Unlike the S1-3 curriculum implemented in 1998, the modules in this curriculum do not have to be taught in any particular sequence throughout the 3 years of junior secondary education. Teachers can organise their curriculum based on the principles of progression as suggested in Section 3.3.1. As for schools adopting different types of integrated curriculum in their junior secondary curricula, Section 3.3.2 provides a few recommendations on how this curriculum could be tailored to fit into their school-based PSHE curricula.

3.3.1 Progression

Progression describes how students' learning advances. When planning the progression of this 3-year curriculum, teachers should consider:

- taking into account of the ways in which pupils mature (intellectually, socially and physically);
- building on what students have already experienced and achieved;
- focusing on what they can be expected to do at the time;
- matching tasks to capabilities and moving students on to the next stage of learning (e.g. moving from concrete to more general concepts).

In this curriculum, there are modules which are more closely related to the daily life of students. The concepts involved in some modules are more concrete than the others. The areal coverage of different modules varies with some focusing on local issues, some on national and regional issues, while some others on global issues. Teacher can plan the progression in geographical learning according to the following aspects:

- An increase in the breadth of studies incorporating a gradual extension of content to include different places, new landscapes, a variety of geographical conditions and a range of human activities.
- An increasing depth of study associated with pupils' growing capacity to deal with complexities and abstractions.
- A continuing development of skills to include the use of specific techniques and more general strategies of enquiry matched to pupils' developing cognitive abilities.
- A continuing development of values and attitudes which is linked to student's ability to discuss, empathise and diagnose issues. There should be opportunities for students to develop understanding of how peoples' attitudes and values influence their actions and to develop views of their own.

The following table suggested how the sequence of the core modules can be organised according to the above principles.

Year	Core module 1	Core module 2	
Increasing abstraction →			
1	Using Urban Space Wisely	Living with Natural Hazards	local ↓
2	Food Problem—Can we Feed Ourselves?	The Trouble of Water—Too much and too little	
3	Scramble for Energy	Global Shift of Manufacturing Industry	global

3.3.2 Tailoring for school-based integrated curriculum

In recent years, schools in Hong Kong have adopted different modes of curriculum planning in their junior PSHE curriculum. For those schools that have adopted integrated approach in structuring their S1-3 PSHE curriculum, geography teachers should communicate with the PSHE cocoordinator and the respective subject panel chairperson (e.g. Integrated Humanities) to ensure the essential learning elements listed in this curriculum can be properly covered in their schools' junior secondary integrated subject curriculum. For schools that offer integrated subject in S1 and S2 and geography as an independent subject in S3, geography teachers will need to tailor-make an one-year geography curriculum to guarantee all students studying senior secondary curriculum will have acquired all the essential learning elements of junior secondary geography. Appendix 1 on pages 111-126 shows a detailed example on how a one-year S3 Geography curriculum is developed in a local secondary school that adopted Integrated Humanities (IH) in S1 and S2 and Geography in S3. In brief, teachers who are responsible for planning the S3 Geography curriculum could follow the steps below:

(a) Identify the basic geographical knowledge and concepts, and core geographical skills that have already been covered in the S1-2 IH curriculum;
(b) Highlight the basic geographical knowledge and concepts, and core geographical skills that are not included in the S1-2 IH curriculum;

(c) Select appropriate modules in this curriculum that provide the missing basic geographical knowledge and concepts, and core geographical skills. Teachers are reminded not to choose modules that overlap with the topics covered in S1-2 IH curriculum;

(d) Finalise the choice of modules based on the interest of students and time available. Teachers can adjust or amend the content of the modules to supplement what are missing in the S1-2 IH curriculum.

No matter which mode of curriculum planning the school has adopted, senior secondary geography teachers should be well-informed of the knowledge, skills and values that have been taught in junior secondary education to facilitate better planning of the senior secondary Geography curriculum.

3.4 Curriculum Management

3.4.1 Understanding the curriculum and learning context

In planning the Geography curriculum in schools, teachers are advised to study carefully the *Personal, Social & Humanities Education KLA Curriculum Guide (P1 - S3)* (CDC, 2002) in addition to this Guide. This is to ensure that the Geography curriculum, together with the other PSHE subjects, can cover the six strands in the PSHE curriculum. They should also understand the vision and mission of their school, its strengths and policies, and the characteristics of their students, especially their learning abilities, interests and needs. Teachers should also be aware of the culture and changing needs of the society, and adopt a flexible approach in planning and managing their Geography curriculum.

3.4.2 Building capacity

For better management of the school Geography curriculum, geography teachers, in particular panel chairpersons, should consider working out a mechanism for more effective professional development through better curriculum management. Since there may be some non-major teachers teaching the junior Geography curriculum, more support should be provided. One of the possible ways of doing so is to strengthen the collaboration among teachers in the panel. Collaboration can take the form of collaborative lesson preparation, team teaching and lesson observation among panel members. These practices often provide opportunities for mutual exchange of experiences and concerns. Collaboration in classrooms, through team teaching or lesson observation, usually helps to improve teachers' professional development if there is adequate trust and good communication and support. Introducing outsiders into the rather closed classroom environment can bring new insights. They can sometimes see things that are "blind spots" to class teachers. Through follow-up discussion and reflection, professional capacity can be enhanced.

3.4.3 Cross-curricular collaboration

Owing to the specific nature of the subject, it is relatively easy for geography teachers to cooperate with other subjects in developing cross-curricular learning. This helps to develop students' multiple perspectives which are needed in many senior secondary subjects. Geography teachers can cooperate with History and Life & Society teachers on designing cross-curricular learning programmes on topics like "City", "Food" and "Industry". Teachers can integrate these topics with the modules "Growth and Development of Hong Kong in the Twentieth Century" in History and "Global City", "An Overview of the Chinese Economy" and "International Interdependence" in Life & Society to enable students to study relating issues from multiple perspectives and make use of the knowledge and skills learnt in different subjects.

Another possible partner for cross-curricular collaboration will be the science subjects. Concepts learnt from the science topics of "Energy", "Living things and air" and "Looking at living things" provide background knowledge for students to understand the geography topics of "Climate Change", "Energy" and "Ocean" thoroughly. Teachers can encourage students to carry out cross-curricular projects so that they can have a more holistic view in investigating issues relating to these topics.

3.4.4 Arrangement for out-of-classroom learning

In order to make learning more meaningful and concrete, teachers should consider organizing out-of-classroom learning activities so that students can relate what they have learnt with real-world experience. Out-of-classroom learning activities are suggested under the column of "skills" for each module included in this curriculum guide. These activities vary from field trips, visits to small-scale interviewing exercises. The site need not be only those far away; it can simply be the school premises or the neighbourhood area. From the curriculum planning perspective, teachers should consider the followings before organizing these activities:

- Can the objectives of the curriculum be fulfilled by organizing this activity?
- How much lesson time would it take?
- Will it be organised during or outside normal lesson time?

Chapter 4 Learning and Teaching

Geographical knowledge is dynamically changing from time to time, and geographical education has shifted from a largely descriptive, regional approach to a positivist, scientific and systematic perspective in the twentieth century, and then now to an issue and enquiry-based orientation. Geography educators have also revised their views on knowledge acquisition — from "being able to remember and repeat information" to "being able to find and use it". It is recognised that knowledge is constructed by the learner through interaction with the world and with knowledgeable others.

The focus of learning in geography is no longer only limited to what students learn, but is also concerned with how they learn and with what brings learning about. Each learner has his/her unique level of readiness (e.g. knowledge, understanding and skills), interests (both current and potential) and learning profile (including areas of strength, weakness and learning preferences and styles), so a wide repertoire of learning and teaching strategies are needed to cater for differences in their ways of learning, while at the same time to maintain a balanced emphasis on knowledge acquisition and skills development in the study of geography. In view of these, this chapter provides guidelines for effective learning and teaching of this S1-3 Geography curriculum.

4.1 Guiding Principles

The following are guiding principles for developing effective learning and teaching strategies in geography at junior secondary level:

(a) A wide range of teaching styles, strategies and activities should be employed to cater for student diversity in learning abilities, needs and interests.

(b) Learning activities should be planned with students' prior knowledge and experience in mind. In order to get all such information about students' readiness, interests and learning profiles, teachers are highly recommended to conduct pre-assessment before the learning and teaching of each issue in the curriculum to avoid teaching in the "black box".

(c) Each learning activity should have clear learning objectives and students should be informed of them at the outset.

(d) Student talk is an important means by which they actualise learning. Teachers should promote quality classroom interaction by effective use of questioning and feedback, and by setting up a supportive classroom atmosphere.

(e) For effective geographical enquiry, student exploration should precede formal presentation by teachers.

(f) Learning activities should be designed to develop generic skills and reflective thinking in the context of the curriculum content.

(g) Students should be encouraged to reflect critically on the procedures and methods they use in learning, and should take responsibility for their own learning.

(h) The roles of teachers and students in different learning activities should be clearly delineated, with both parties being well informed of their roles.

(i) Feedback and assessment (especially the formative ones) are integral parts of learning and teaching, in particular in setting targets for future learning. (For details about assessment for learning, you may refer to Chapter 5 of this guide.)

(j) A range of resources, especially those involving the use of information technology (e.g. Geographic Information System / GIS), should be used flexibly to support student learning.

(k) Student motivation is crucial and strategies should be adopted to arouse the interest in learning. The use of contemporary issues / hot news to stimulate geographical enquiry and enquiry-based fieldwork are two effective ways of motivating students to learn geography.

(l) Each student has unique learning abilities, interests and needs. Learning activities and tasks should allow for variation in the pace and depth of learning, and provide different opportunities for student learning and for different outcomes. Likewise, a variety of strategies for the assessment of student learning is needed.

4.2 Approaches and Strategies

Junior secondary Geography curriculum is focused on both geographical knowledge and skills for students going into further study. Of equal importance is the cultivation of positive values and attitudes in students. Besides those disciplinary skills, the curriculum also helps students to develop various generic skills and the general intellectual capacity for lifelong learning.

Although there are various common and intertwining pedagogical approaches (e.g. teaching as direct instruction, enquiry and co-construction) that can be employed to facilitate the delivery of this curriculum, teachers are highly recommended to choose the enquiry approach with some of its advantages described below.

All modules in this curriculum are either issues or problems related to Hong Kong, our country (China), our region (Asia-Pacific) and the world. They are best delivered to students with the enquiry approach. Enquiry enables students to master geographical concepts and knowledge during the course of investigation. Contrary to the traditional, spoon-fed didactic approach, enquiry allows students acquire knowledge via solving problems, analyzing different viewpoints or information and making judgments based on a wide range of information from various sources (e.g. books, newspaper articles, video clips and information on the Internet). Moreover, this approach allows students to practice frequently a number of generic skills, as well as the development of positive values and inquisitive attitudes in them.

As current issues or problems often have strong relevance to the daily life of students, another advantage of this approach is that it enhances students' motivation by making learning more interesting and meaningful. This is especially the case for students who are academically less able. By providing various "specific examples" with different scales in each module of this curriculum, teachers may further differentiate their instructions based on their findings on the readiness, interests and learning profiles of students.

4.2.1 Learning through enquiry

Enquiry learning can provide students with the capacity and motivation to become active learners, team workers, critical and creative thinkers, problem-solvers and decision makers. Through enquiry, students can construct knowledge about the world in a challenging and authentic way. In the process, students are encouraged to ask geographical questions and to seek answers independently. The information and experience they gain enable them to look at issues or problems from different perspectives. Students are also taking increasing responsibility for their learning as they actively involve in investigating issues. Being more self-directed in their learning, differentiated instructional strategies can be adopted easily by teachers to solve problems related to learner diversity.

Geographical enquiry usually starts with identifying an issue, a problem or an interesting phenomenon / pattern with a strong spatial and/or ecological perspective. Through using the five "W"s of geography — "What", "Where", "How", "Why" and "What if" — to examine issues, students can establish a strong geographical perspective; and key geographical concepts and knowledge are then introduced to help them understand, interpret and analyse the issue. The following route of geographical enquiry is commonly found in many enquiry-based geography lessons:

Step	Examples of Key Questions	Details
(1) Observation and perception	"What?"	• Aware of an issue / a problem arising from people-environment interactions
(2) Definition and description	"What?" and "Where?"	• Outline and define the issue / problem • Find out the linkages with existing knowledge • Ask geographical questions (i.e. five "W"s) • Suggest appropriate sequence of enquiry / investigation • For fieldwork enquiry, decide on data and evidence to be collected • Collect data and information relevant to the enquiry • Describe / present the data, information or evidence
(3) Analysis and explanation	"How?" and "Why?"	• Distinguish between relevant and irrelevant data • Sort and analyse the data and evidence • Give explanations • Decide whether additional or different data / information / evidence is required
(4) Evaluation, prediction and decision making	"What might?", "What will?" and "What decision?"	• Evaluate the results of the enquiry • Make generalizations or predictions (if any) • Propose alternative action (if any) • Make decision based on the evidence and information collected • Draw and justify conclusions
(5) Personal evaluation and judgment	"What do I think?", "Why?" and "What shall I do?"	• Determine the values that are important to oneself • Make personal judgment on the issue (including values) • Decide whether to take action so as to change one's personal lifestyle

In the learning and teaching of junior secondary Geography through enquiry, teachers extend their role from knowledge transmitters to learning facilitators. As facilitators, geography teachers should:

- help students to formulate learning goals and identify the most appropriate means of achieving them;
- assist students to develop positive learning habits, master learning strategies and develop metacognitive skills to steer their learning;
- create a stimulating and motivating learning context so that students are intellectually curious;
- provide a framework for students, especially those struggling learners, to organise their study in a systematic way; and
- develop a supportive, tolerant and mutually accepting learning community to allow students to participate actively in learning without the fear of being criticised.

Instead of being passive receivers of knowledge in didactic approach, students should:

- set meaningful and realistic goals for their own learning;
- take the initiative to consult teachers, to collaborate closely with others and to share learning experiences with peers;
- develop a positive attitude towards learning geography by engaging actively and confidently in learning, despite the risks of making mistakes or encountering difficulties; and
- reflect on their learning experiences, and monitor and evaluate their own learning progress.

4.2.2 Learning through maps

Being an important tool of geographers, maps (in the forms of paper and digital ones) are the most effective medium for recording, displaying, analyzing and communicating information about people and places. By overlaying layers of map information with Geographic Information System (GIS), maps can even be used to solve many real world problems, such as finding out the spreading pattern of a type of infectious disease and analyzing its probable impacts on people and the environment. Besides being used in academic studies, maps can also be used in our daily lives, such as using “Google Map” and “Google Earth” on the Internet to find routes, location and planning for our holidays. In other words, map skills are crucial life skills that should be learnt by all students. As such, geography teachers should pay considerable effort to ensure that their students are able to master a reasonable level of map skills after finishing their junior secondary studies.

The teaching of map skills should not be treated as a separate topic in geography, but should be integrated into the learning and teaching of geographical issues and problems in the curriculum. Teachers should develop a planned and structured program to familiarise their students with the following 4 essential properties of maps:

- Plan view (perspective and relief)
- Arrangement (location, direction and orientation)
- Proportion (scale, distance and selection)
- Map language (signs, symbols, words and numbers)

Map skills should be developed through a well-planned schedule, starting from elementary map skills (such as drawing simple sketch maps of students' familiar surroundings). It can be extended to calculation and transformation (such as drawing of cross-section), and then to more complex skills like generalization and identification of patterns and relationships on maps. Students should be encouraged to familiarise with different varieties of maps of different scales and contexts. After three-year study of junior secondary geography, students should be well-equipped with the map skills which are essential for the study of higher level geography as well as for practical use in their lives. For details about such essential map skills in junior secondary level, teachers should refer to "2.5 Essential Learning Elements" and the part "Skills" included in each module of this curriculum.

4.2.3 Learning in the field

Fieldwork is a distinctive attribute of geography and has a long tradition as an established component of geographical education. It can be considered as any activity which takes place outside the confinement of classroom. It provides students the opportunities to apply the knowledge/ concepts learned in the classrooms to the real world, and through this to acquire new knowledge/ concepts. In addition to knowledge acquisition and application, different subject-specific skills (such as field sketching and land use plotting) and generic skills (like problem-solving and critical thinking) can be developed through fieldwork. As such, fieldwork has important contributions to make geography real and enjoyable, and every geography student of S1-3 should be entitled to have a reasonable amount of fieldwork experience throughout their three-year junior secondary studies. Teachers may refer to "2.5 Essential Learning Elements" and the part "Skills" included in each module for details of various fieldwork skills that should be included in the learning and teaching of this curriculum.

Fieldwork activities in junior secondary level should involve students in applying a range of knowledge and skills to a "real world" problem or issue. Fieldwork should not be limited to be purely "field excursions" and "guided tours", in which the teacher dominates most of the talking and students concentrate solely on listening, observing, note-taking and photo-taking. Fieldwork should be enquiry-based as this aligns with the aims and objectives of this curriculum. Such enquiry-based fieldwork experience also helps students to build up a good foundation for their fieldwork investigations in senior secondary level. The starting point for such an approach is the identification of an issue or a problem related to the interaction of people and their environment in a specific locality, and then leading to appropriate data collection, data presentation and analysis, as well as identification of possible solutions or management strategies. Examples of enquiry-based fieldwork for junior secondary students and further suggestions on this type of fieldwork can be found in the CD-ROM "Enquiry-based Fieldwork in Geography (Part 1)" published by the Education Bureau.

Fieldwork should not be confined to large-scale, whole-day activities in distant locations. Small-scale fieldwork conducted near the school premises (such as conducting local fieldwork on urban problems or slope stability near a school) should also be considered. In addition to low cost, this kind of fieldwork is easier to manage and it can be completed within a short period of time. Teachers should note that value of fieldwork lies on whether it can help students learn how to identify, to observe, to collect, to apply and to analyze, not on how long it takes or how much work the students have to complete.

4.2.4 Using information technology in learning

With rapid development of information technology (IT) in the past decade, IT can be used to promote interactive learning both inside and outside classrooms. The use of IT does not only make lessons more lively and enjoyable, thus enhancing students' learning motivation, but it can also reduce the heavy workload of teachers by making it easier for resource production or allowing teachers to access rich reserves of teaching resources all over the world.

Geography teachers should use IT in their teaching whenever appropriate and should also provide adequate opportunities for their students to apply IT in the learning of this curriculum. With multimedia-enriched presentations, abstract concepts, such as those about plate tectonics, as well as weather and climate, can be explained more clearly and easily. IT also links students to the vast network of knowledge and information outside their classrooms (e.g. through the Internet). Information in various websites provides updated data for discussion and research, which facilitates enquiry learning and self-learning. Through school intranet systems, e-mail and Web 2.0 technology

(including social networking tools, such as “Facebook” and “Twitter”), students can also share ideas and learning resources, discuss various geographical issues and even communicate with their teachers. Learning thus is no longer confined by time and space. A list of websites suitable for the learning and teaching of this curriculum is included in the Appendix 2 for teachers’ reference.

Of the many IT tools available, Geographic Information System (GIS) and Global Positioning System (GPS) are two which are highly related to geography. GIS is a powerful IT tool which connects geographical information to location, so as to bring out various spatial patterns. Through layering, GIS gives understanding of how all such spatial information interrelates, which in turn facilitates decision-making and answering “What-if” questions in geographical enquiry. GIS also allows learners to handle spatial data faster and more efficient than before. Lesson time can be spent on higher-order analysis of spatial patterns. Every student taking junior secondary geography should be given opportunities to use GIS in their geographical enquiry (e.g. using GIS and GPS for collecting, recording, handling and analyzing fieldwork data). Besides using those commercial GIS software programmes which may be too complicated for beginners / junior form students, teachers may consider to use those GIS freeware on the Internet. The use of “Google Earth” in geographical learning and teaching is a good example of this. Further suggestions on how to integrate GIS in the learning and teaching of this curriculum can be found in the part “Skills” included in each module.

In order to integrate IT into their lessons successfully, geography teachers should consider the following points carefully before employing the IT tools they choose:

- The IT background (including skills and experiences) and interests of your students;
- Learning styles (e.g. directed or open) and organization of your classes (e.g. individual, group or whole-class);
- The IT tools chosen should further your students’ geographical understanding and skills (both geographical and IT skills);
- They should match with the objectives, as well as intended and unintended outcomes of the lessons;
- Venues of the geography lessons and the availability and applicability of the IT tools in such venues;
- Efficiency of using them in terms of time; and
- The availability of IT supporting staff in your school (e.g. technicians, IT helpers, IT teachers and librarians).

4.3 Catering for Learner Diversity

Since every learner has his/her own unique style of learning, there will always be variations in the ways students learn, the speed of learning, what they find difficult, and their level of attainment. In order to teach well, teachers should attend to all these aspects related to learner diversity. Instead of using "one-size-fits-all / single-size" instruction (i.e. without differentiation), geography teachers should consider to employ various differentiated instructional strategies in their mixed-ability classrooms to address academic diversity.

4.3.1 Differentiated Instruction

In a differentiated classroom, student differences are important elements in learning and teaching. Students in such classrooms usually have a variety of options for:

- taking in information or ideas (or differentiation in learning content / input);
- making sense of the information / ideas (or differentiation in learning process); and/or
- demonstrating what they have learnt (or differentiation in learning product / output).

In other words, differentiated instruction is flexible and responsive teaching. Under proactive and careful planning, differentiated instruction provides different pathways for students with different learning styles to acquire all essential learning elements in this curriculum. Although differentiated instruction provides several avenues to learning, it is not equivalent to "individualised instruction" which assumes a separate level for each student. All such "avenues" should focus on big ideas / concepts in the curriculum which are meaningful learning for all students, even though they provide variations in terms of difficulties and formats for those advanced learners and struggling learners. In a differentiated classroom, a geography teacher teaches the whole class (whole-class components) sometimes. For the other time, he/she works with small groups / individuals to address academic diversity (differentiated components). The key elements of differentiated instruction are explained in the following paragraphs.

(a) *Changing Teacher Mindset*

Effective differentiated instruction starts with teachers having a "growth" mindset. Teachers with a "growth" mindset believe that students can achieve if they work hard and put in sufficient effort. By setting high goals and providing relevant support to students, teachers can help most students succeed in their learning. With good teacher-student relationships, a caring teacher with a "growth" mindset can motivate passive, discouraged and disengaged students to connect to their learning again. Besides connecting with individual students, a teacher should try to build a learning community in his/her class. He/she should organise the

students to work as a team and develop in students the belief that they win or lose together as a team. Such a collaborative team spirit, with clear learning goals for progression into the next stage of learning, can encourage each student to be responsible for his/her own growth. Each student in a class is now in competition with his/her own, not against others. Such a learning environment is favourable for addressing academic diversity.

(b) *Quality Curriculum Content and Teaching Up*

In a differentiated classroom, teachers should ensure that the content of each lesson delivered to students is important and meaningful to them (i.e. focused on key ideas). Teachers should identify the key principles or concepts, as well as core knowledge, skills, values and attitudes to be developed before teaching. These should be the essential learning elements that have to be learnt by all students regardless of their learning abilities. With this in mind, teachers can then vary the content / process / product of learning based on pre-assessment results on the readiness, interest and learning profiles of students.

Instead of just giving more work to those advanced learners and lowering down the requirements for those struggling learners, teachers using differentiated instructions should create a quality and rich curriculum that can help to stretch the potential of their students to the maximum. The major task of the teachers is to help students with different readiness levels by providing various types of support so that every student is capable of maximizing what they can achieve. Differentiation should always be about "lifting up" the potentials of students.

(c) *On-going assessment with clearly set assessment criteria*

Quality differentiation is guided by on-going assessment. This type of assessment aims at collecting data on students' readiness, interests and learning profiles on a recurrent basis for lesson planning and giving feedback to students. It should be carried out before, during and after every cycle of learning and teaching. Before the start of a teaching unit, teachers should conduct pre-assessment to avoid teaching in the black box. Such pre-assessment may be simple formal assessment / survey (like Figure 4.1 and Figure 4.2) or informal observation by teachers during some well-planned classroom activities before the teaching of a module.

During the course of teaching, it is advisable to carry out assessment for learning periodically to monitor students' progress and see if re-teaching of some of the parts are necessary. An "exit card" (Figure 4.3) is one of such assessment methods. Teachers may further differentiate their questions / requirements in an on-going assessment, such as homework assignments. This differentiation of learning products (e.g. giving students graded data-response questions or different coursework formats to choose), with clearly set assessment criteria, can help students with different learning styles learn better.

Name: _____ Class: _____

Complete the following diagram to show what you know about sustainable development.
Write as much as you can.

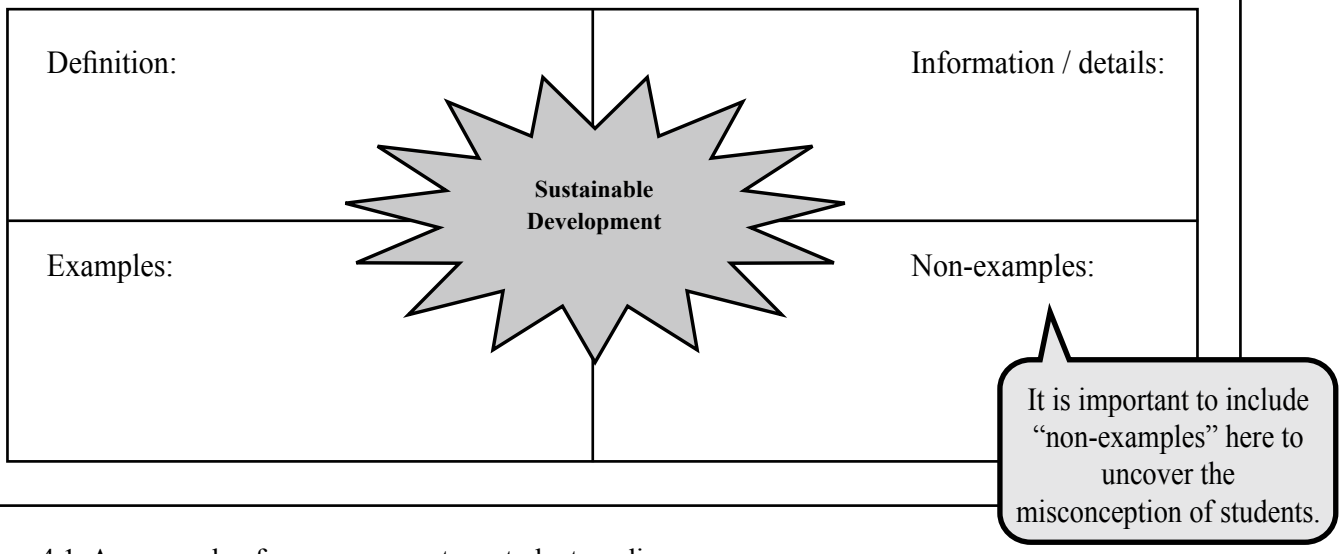

Figure 4.1 An example of pre-assessment on student readiness

Interest Survey

Name: _____ Class: _____

Describe your interests below with suggested connections of your interests with geography.
Such information may help me to understand more about your learning needs. Thanks.

Interest: Connection with geography:	Interest: Connection with geography:
Interest: Connection with geography:	Interest: Connection with geography:

Figure 4.2 An example of pre-assessment on student interests

Exit Card —Water Cycle

Name: _____ Class: _____

- What is a water cycle?
- How does it operate?
- ……

Figure 4.3 An example of an exit card

(d) *Flexible Grouping*

In differentiated classrooms, teachers group students flexibly in the learning process according to the readiness, interests and learning profiles of students. Teachers can group their students homogeneously (i.e. students with similar abilities / interests / needs are in the same group) in some cases but group them heterogeneously (group students with different abilities / interests / needs together) in other cases. Teachers can also allow some students to do work individually or in pairs. Flexible grouping arrangement enables students to learn collaboratively so that learners with different abilities can learn as a team, help each other and work for success together.

(e) *Various Differentiated Instructional Strategies*

Based on the readiness, interests and learning profiles of students, teachers can use different differentiated instructional strategies to cater for their learning needs. Examples of such strategies include learning contracts with menus, "RAFT", scaffolding, tiered assignments, learning centres or stations and web quests. Learning may be differentiated in:

- ***content,*** e.g. by using geography materials of different level of difficulty and readability for students with different readiness levels; or by using materials containing different contents or on different topics but focused on the same key ideas for students with varied interests. For the latter, teachers may ask students with different interests to study materials of different types of natural hazards, such as typhoons, landslides and earthquakes. Although choices are given, all of these materials and student learning are focused on the study of the key elements of natural hazards, that is, the causes and impacts of these hazards.
- ***process,*** e.g. by using scaffolding or learning contracts.
- ***product,*** e.g. by asking students to do assignments with multiple modes of expression.

In differentiation, students are usually given choices on what to do and how to do (individually, in pairs or groups). Differentiated instruction helps students take increasing responsibility of their own learning. Among the differentiated instructional strategies mentioned above, "RAFT" and "learning contracts with menus" are chosen as examples below to explain how differentiated instruction can be used in the learning and teaching of this curriculum to cater for learner diversity.

RAFT Assignments

"RAFT" is an acronym for "Role", "Audience", "Format" and "Topic". In a RAFT activity students are given different roles and they need to develop different products / assignments on given topics with particular formats for specified audiences (see Figure 4.4). RAFT assignments are usually with short duration but they give teachers great flexibility in dealing with learner diversity by providing learning choices for students.

RAFT Assignments on Climate Change

The following RAFT assignments are designed for S2 geography students on climate change. The focus of the assignments is on the key concepts of climate change but with different presentation formats for students to choose.

RAFT Objectives

Knowledge: …

Skills: …

Values and attitude: …

Now, choose and complete your most favourite one from the **RAFT** assignments below:

Role	Audience	Format	Topic
Sea with a rising level	People living at Tuvalu	Letter	Why we have to stop seeing each other?
Polar bear	Polar ice	Song	I need you
Trees	Hong Kong residents with high air-conditioning cost	Oral response	My life is worth saving
You may suggest your own RAFT on climate change. Ask your geography teacher for approval.			

Figure 4.4 A "RAFT" on climate change

Learning Contract with menu

A learning contract (usually with choices) is an agreement between a teacher and a student. A learning contract has different formats, but usually it includes clear learning objectives, guidelines and requirements of the assignment, deadline and assessment criteria. Learning contracts help students take increasing responsibility of their learning.

Learning menus, usually included in learning contracts, are designed to provide learning choices to students. A learning menu usually includes 3 main parts listed below:

- **"Main Course / Dish"**: This is the **compulsory part** (must do) of the menu. All students are required to finish all activities in this part, which are focused on key concepts / ideas of an issue / problem. This ensures that although students have academic diversity, they can acquire all essential learning elements of the learning unit. According to students' needs, teachers may further differentiate the "Main Dish" tasks, e.g. preparing 2-3 sets of "Main Dish" on the same topic but with different levels of difficulty. They are of similar length and appearance for students with different reading levels.
- **"Side Dish"**: This is the **elective part** (choose to do) of the menu which contain different options to meet the varied needs and interests of the students.
- **"Dessert"**: This is the **extended part** of the menu which usually includes enrichment tasks to further stretch the potentials of the students. Students can choose whether they will complete this part.

An example of a learning contract with menu activities is given in Figure 4.5.

A Geography Learning Contract - Student Copy

Menu of the week: Natural hazards

Major concepts / key questions of the issue:

- What are the **causes** and **impacts** of different types of **natural hazards?**
- What are their **preventive and remedial measures?**

Objectives: …

Guidelines and timeline:

All items in the main dishes and a specified number of side dishes should be completed by you during your Christmas holidays (Due date: 2 Jan. 20xx). You may choose any one item from the side dishes. For the desserts, you may choose to complete one / two / none of them. A list of assessment criteria is also attached with the menu for your reference. It will be used for your self-assessment and as an assessment tool of your geography teacher. After the completion of the menu activities, remember to complete your self-evaluation form.

Main Dishes—Map work and landslides: (You must complete all the tasks in this part.)

1. Based on the contour map of Area A,
   - find the height of Points C, D and E;
   - calculate the gradient of Slope X; and
   - construct a cross-section from Point C to Point D and calculate its vertical exaggeration.
2. Based on map evidence, explain why Area A will most likely be affected by landslides.
3. Suggest preventive measures that can be adopted to reduce the negative impact of landslides in Area A.

Side Dishes—Earthquakes: (You must complete any one of the tasks in this part.)

1. Drawing diagrams:
   - Draw 3 annotated diagrams on cards to show how earthquakes occur at constructive, destructive and conservative plate boundaries respectively.
   - Design a leaflet which includes a list of safety rules to follow during the occurrence of an earthquake (Hint: Surf the website of the Hong Kong Observatory - http://www.hko.gov.hk)
2. Letter-writing:
   - Suppose you were a resident in Sichuan. Write a letter to your friend in Hong Kong in about 200 words to describe your experience in an earthquake.
   - Include in your letter the recent earthquake events in Sichuan and their causes. Show the responses of your government to these events.
   - You may also include a few relevant photos in your letter (can be obtained from the Internet).
3. Oral presentation:
   - Prepare a PowerPoint presentation on the global distribution of earthquakes, as well as their causes and effects.
   - Include in your PowerPoint file a digital map showing the global distribution pattern of plate boundaries and the locations of earthquake hazards. The map may be created using Geographic Information System (GIS) software or a downloadable freeware - "***Seismic Eruption***". "Seismic Eruption" can be downloaded from the website http://bingweb.binghamton.edu/~ajones/. Details on how to use this freeware can be found on P.103-109 of "A Teacher's Guide to GIS Operations: Using Geographic Information System (GIS) for implementing enquiry learning in Geography" published by the Education Bureau in 2009.
   - You will be given 10-15 minutes to present your findings in your coming geography lessons.

Desserts—Climatic hazards: (The tasks here are optional. Finish any item(s) below if you wish.)

1. Visit the website of the Hong Kong Observatory (http://www.hko.gov.hk) and choose to view the information of a tropical cyclone on the list (click ***"Tropical Cyclones" on the left-hand side menu and then click "Tropical Cyclone Track and Position"). You may also choose to look at*** the part ***"Tropical Cyclone Track Information on GIS Platform"***.
   If you view the part "Tropical Cyclone Track Information on GIS Platform", remember to use GIS functions, like ***pan, zoom in, zoom out and identify.***
   - Describe the general path of a typhoon affecting the Asia-Pacific region (including Hong Kong) and your personal experience about typhoon in about 50 words.
2. Visit the following websites to see satellite images and photos about another climatic hazard — sandstorm.
   - Hong Kong Observatory (http://www.hko.gov.hk/press/SP/pre20100322e.htm)
   - 2009 Australian dust storm-Wikipedia (http://en.wikipedia.org/wiki/2009_Australian_dust_storm)
   - Dust storm in Australia-The Big Picture-Boston.com (http://www.boston.com/bigpicture/2009/09/dust_storm_in_australia.html)
     By clicking the photos with a label "click on this image to see it fade" in this website, you can compare photos of different parts of Sydney before and after the occurrence of a sandstorm.
   - Describe the possible impact of sandstorms in the world and your relevant experience (if any) in about 50 words.

Assessment Criteria:

The following criteria will be used for your self-assessment as well as assessment by your geography teacher.

1. Map work ☐ Follow directions ☐ The height of Points C, D & E are correct ☐ The gradient of Slope X is correct, with calculation shown. ☐ The cross-section is correct and labeled ☐ A caption is included in the cross-section ☐ Vertical exaggeration is correct, with calculation shown ☐ Neat and accurate Total: _____	**2. Short explanation with map evidence** ☐ Follow directions ☐ At least 3 reasons given for the occurrence of landslides ☐ Map evidence is given ☐ Neat and accurate Total: _____	**3. Short description** ☐ Follow directions ☐ At least 4 preventive measures should be given ☐ Neat and accurate Total: _____
4. Drawing diagrams ☐ Follow directions ☐ 3 cards with correct annotated diagrams are produced ☐ Relationship between plate movement and earthquakes is clearly explained ☐ A list of at least 5 safety rules are included in a leaflet ☐ Neat and accurate Total: _____	**5. Letter-writing** ☐ Follow directions ☐ List at least 2 recent earthquake events in Sichuan ☐ Explain clearly the causes of earthquakes ☐ Describe your government's responses to the hazard ☐ Present in the format of a letter ☐ Photos showing the effects of the hazard are included ☐ Neat and accurate Total: _____	**6. Oral presentation with PowerPoint and GIS** ☐ Follow directions ☐ A PowerPoint is produced ☐ Causes of the hazard is explained ☐ At least 3 effects of the hazard are included ☐ A digital map created by any GIS software / freeware is included ☐ Includes map key and caption ☐ Neat and accurate ☐ Oral presentation is conducted Total: _____

7. Short description with web images and GIS ☐ Follow directions ☐ Website visited ☐ GIS functions used ☐ Path of a typhoon Described ☐ Personal experience Total: _____	**8. Short description with satellite photos and web images** ☐ Follow directions ☐ Websites visited ☐ Impact of sandstorms described ☐ Personal experience Total: _____	
I understand and will complete this contract to the best of my ability and effort. Student Signature: _____ Student Name: _____ Date: _____		

Figure 4.5 A sample menu contract

The menu contract in Figure 4.5 is a student copy. In addition to student copy, menu contract also has teacher copy. Besides the full content of student copy, the teacher copy also includes the following parts which help teachers to plan for their lessons with differentiation:

- Description about the academic diversity of the students (including their needs and interests) related to this topic.
- Assessment plan (including pre-assessment and other assessment for learning tasks).

Although extra time is required for creating menu contracts and collecting more learning resources for differentiation, teachers may soon find that students' improvement in their studies and their increasing independence are the payoff. Students enjoy the choices given to them and are motivated to learn geography.

4.3.2 Collaborative Learning

Research evidence shows clearly that students learn best when they are actively involved in their learning processes. They tend to learn more, retain the information longer and be more satisfied with their studies when learning in a group. Through cooperation among members of a group, all group members with different strengths and weaknesses can help each others and succeed together.

Learning groups may include informal and formal ones. Informal learning groups are ad hoc in nature. Teachers may group students in a class within a single lesson temporarily for activities like short discussion. The formal ones are groups which are formed for completing a task over a period of time. These formal groups, under careful planning, help to cater for learner diversity. For example, geography teachers may consider forming long-term groups which can be labeled as "study teams". These study teams can last for a term or a year. Members of each study team are responsible for giving learning support, assistance and encouragement to their team members so that the whole team can meet the requirements of their teachers.

To enable collaborative learning to be effective to cater for learner diversity, teachers have to note the following points:

- Students' prior academic achievement, interests and needs should be considered when forming student groups.
- Group size should be kept small to avoid passive observers in groups. In general, groups of 3-4 students work best in learning.
- Clear suggestions on division of labour in a group should be given. Make sure each group member know clearly his/her responsibility.
- Set up clear guidelines for group members to collaborate and follow in their learning.
- Promote interdependence among group members. Students in a group should perceive that they "win" or "lose" together and one cannot succeed unless all in a group succeed.
- Help group members to acquire the basic skills of collaborative learning, such as listening skills (with tolerance to others), skills on helping each other in a group to master subject content, giving and receiving comments, as well as skills on managing disagreement among members.
- Design and structure group tasks in a way that each group member can have equal contribution.
- Help each group to plan for their learning, especially on how to proceed. Check their progress periodically and give feedback to them.
- Peer assessment should be included so that group members can evaluate their contribution in the group.
- Clear assessment plans, with assessment criteria, should be given to all group members in advance.

Chapter 5 Assessment

To make simple, assessment is getting to know what and how a student is doing in her/ his learning. It collects evidence about student learning, giving feedback to students, teachers, schools and parents on the effectiveness of teaching and on students' strengths and weaknesses in learning. On the other hand, assessment can be used to grade students for selection purposes, such as differentiating who is more suitable and eligible for further studies or for employment. Assessment also provides data for accountability, stating how well students, teachers and schools have performed. However, since at junior secondary level the competition for school places or for employment is never a concern, the prime function of assessment should obviously for learning.

In view of the above, this chapter views assessment as an integral part of the learning and teaching cycle and discusses the principles that should guide assessment of the subject. It also provides guidance on how to develop internal assessment of the subject in schools, and introduces a number of assessment strategies that can be used to assess student learning in geography. For general principles of assessment, teachers can refer to 5.4 "Developing School Assessment Policy — Balancing Assessment for Learning and Assessment of Learning", Booklet 5, Basic Education Curriculum Guide — Building on Strengths (2002) and Chapter 5 "Assessment", Personal, Social and Humanities Education Key Learning Area Curriculum Guide (Primary 1 - Secondary 3) (2002).

5.1 Guiding Principles

Teachers should note the following guiding principles when assessing students' learning effectiveness in this Geography curriculum:

(a) Regardless of which assessment approaches and strategies are used, the main purpose of assessment in junior secondary geography should always be for the *improvement of student learning;*

(b) Assessment practices in schools should be *aligned with the learning objectives* of the subject. For S1-3 geography, the prime objectives include the understanding and application of core geographical concepts and knowledge, the mastery of basic geographical skills for enquiring issues, and the development of values and attitudes contributing to the sustainable development and betterment of human societies and the natural environment (for details, please refer to Section 2.5);

(c) Assessment in geography should be planned with *appropriate weighting on knowledge and concepts, skills, values and attitudes.* For S1-3 geography, particular emphasis should be laid on students' capabilities of applying their knowledge and skills to real life situations, such as the enquiry of geographical issues. Teachers are also reminded not to avoid the assessment of values and attitudes although they cannot be easily measured by conventional assessment strategies;

(d) There are core geographical competencies that cannot be assessed satisfactorily through traditional paper-and-pencil examinations. Examples include the ability to ask geographical questions in the field, to identify spatial patterns through field observation, to locate and collect first-hand spatial data, and to conduct geographical enquiry that involves hypothesis testing, decision-making and/or value judgement. As such, it is necessary for schools to include assessment strategies that can help evaluate students' development of these competencies;

(e) Since the thorough mastery of core geographical concepts and skills by students requires a considerable period of time, teachers are encouraged to set up appropriate mechanisms to *track students' learning progress over time.* Teachers should assist student to set their own incremental targets and manage their own pace of learning. This is particular true for the development of geographical skills like map interpretation. In addition to worksheets, exercises and essays, teachers can consider field enquiry studies, project work and portfolios that are more capable of demonstrating students' learning progress and performance over a period of time; and

(f) Assessment practices incorporating different levels of difficulty and in diverse modes should be adopted to *cater for students with varying learning abilities and aptitudes.* This helps to ensure that the more able students are challenged to develop their full potential and the less able ones encouraged to sustain their interest and sense of success in learning.

5.2 Assessment for Learning

Assessment for learning is concerned with obtaining feedback on learning, and utilizing this to make learning more effective and to introduce any necessary changes to teaching strategies. It is underpinned by the confidence that *all students can learn and improve.* Through assessment for learning, teachers share the learning goals and requirements with their students. Along with continuous revision and reflection on students' performance and progress, teachers should provide feedback to their students so that they know what should be done next to improve. As such, assessment is used for widening the opportunities for learning in addition to the measurement of learning outcomes.

To implement assessment effectively in schools, it is essential to include both formative and summative assessment appropriately in the school assessment framework. Formative assessment refers to the collection of evidence of student learning on a short-term, day-to-day basis to monitor, to provide feedback and in the end to promote better learning. Summative assessment, on the other hand, is usually practiced at the end of a teaching unit, a school term or a school year to summarise students' performance. It is clear that assessment for learning is more formative in nature while summative assessment, which is concerned with making a determining progress in learning, is often referred to as "assessment of learning".

To sum up, assessment for learning usually takes place in daily teaching and should be adopted as a core component of everyday classroom practice. Teachers are reminded to take note of the following essence of the strategy:

(a) Assessment for learning should be embedded in the process of learning and teaching;
(b) Teachers should share learning goals with students and help them identify and/or set up targets for pursuing;
(c) Feedback should be provided to enable students to identify the next steps to build on success and strengths as well as to correct weaknesses;
(d) Both teachers and students should be involved in reviewing and reflecting on students' performance and progress; and
(e) Teachers should play the role of facilitators and try to engage students in peer assessment and self-assessment as far as possible.

5.3 Assessment Strategies and Practices

The assessment of students' performance can be classified according to the timing of implementation, namely short-term, medium-term and long-term assessment.

Short-term assessment strategy refers to assessment that is taken place on a daily or weekly basis to measure students' development of knowledge, understanding and skills in individual lessons. Common short-term assessment practices include group discussion, oral presentation, class observation, oral questioning in class and feedback by marking.

Medium-term assessment strategy concerns the assessment of students' performance in learning a unit, a topic or within a school term. It involves less frequent, more in-depth and formal assessment practices which includes quizzes, unit tests, self-assessment and peer assessment.

Long-term assessment strategy includes both summative and formative assessments that are only implemented once or twice per school year, such as term tests, half-year and final examinations, project reports and portfolios.

The following sub-sections intended to highlight a few more common assessment practices adopted by many geography teachers. They aim at providing essential reminders concerning how those assessment practices should be designed and implemented, as well as pointing out a few common errors that may be committed by teachers.

5.3.1 Effective Questioning

Questioning is an essential part of the teaching practice and the most common assessment practice adopted by teachers in classroom. Besides checking how much the students can remember of the previous teaching, carefully planned questioning can facilitate teachers to discover the learning obstacles that hinder their students from understanding the lesson, to further challenge their students to think deeper, as well as to enable their students to offer more alternative explanations or to improve the answers given. To accomplish these desirable outcomes, teachers are reminded to pay attention to the following advices:

(a) Clarify the purposes in asking questions, and ensure that they are relevant to the assessment objectives;

(b) Carefully phrase the question to ensure that it is clear to all students;

(c) Allow sufficient wait time (at least a few seconds) for students to think and formulate answers. Short wait time prevents students from taking part in the classroom discourse and confines teachers to ask simple, closed questions, resulting in very superficial classroom dialogue filled only with recall of terms and facts;

(d) Avoid simple "yes-or-no" or "choose A or B" questions. It is more appropriate to ask questions that require students to give longer, extended and thoughtful answers.

☒ *"Is raw material still an important factor in influencing industrial location in the 21st C.?"*

☑ *"Why do we say that raw material is still an important factor in influencing industrial location in the 21st C.?"*

☒ *"Some people said that global warming is just a long term fluctuation of world temperature. Do you agree or disagree?"*

☑ *"Some people said that global warming is just a long term fluctuation of world temperature. What do you think?"*

Consider using the following questions that help developing student reflection and promoting discussion.

- *"What do you think of Edmond's answer?"*
- *"What could we add to Mary's answer?"*
- *"David said … and Susan thought … but can we bring all these ideas together?"*

(e) Try to anticipate students' possible responses when planning questions.

- *What type of responses do I expect from the students — a solution or an example?*
- *What type of answer will I accept — student's own expression or just wordings from the textbook?*
- *If students do not respond, what will I do? How should I rephrase my question? (In this case, teacher may need to modify the wordings of the question.)*
- *How should I follow up when the student give a correct answer?*
- *If student gives an incorrect answer, how should I respond?*

5.3.2 Feedback by Marking

Feedbacks given by teachers in marking students' written assignments are very helpful in improving students' learning. When giving written feedbacks, teachers should pay attention to the followings:

(a) The feedback / comments to students about their work should be given promptly and regularly;

(b) Teachers should always give constructive feedback to help students understand what the tasks require and how to improve their future work. They should avoid giving critical comments that damage students' self-esteem as this will be very de-motivating; and

(c) Feedback will be more effective if it is focus on the task and encourages students to think about the task. It is advisable for teachers, through their written comments, to point out the gap between the standard and students' actual performance and to provide suggestions about the ways students can improve their work.

Figure 5.1 below is an example of a quality feedback given by a teacher to a short essay submitted by her student.

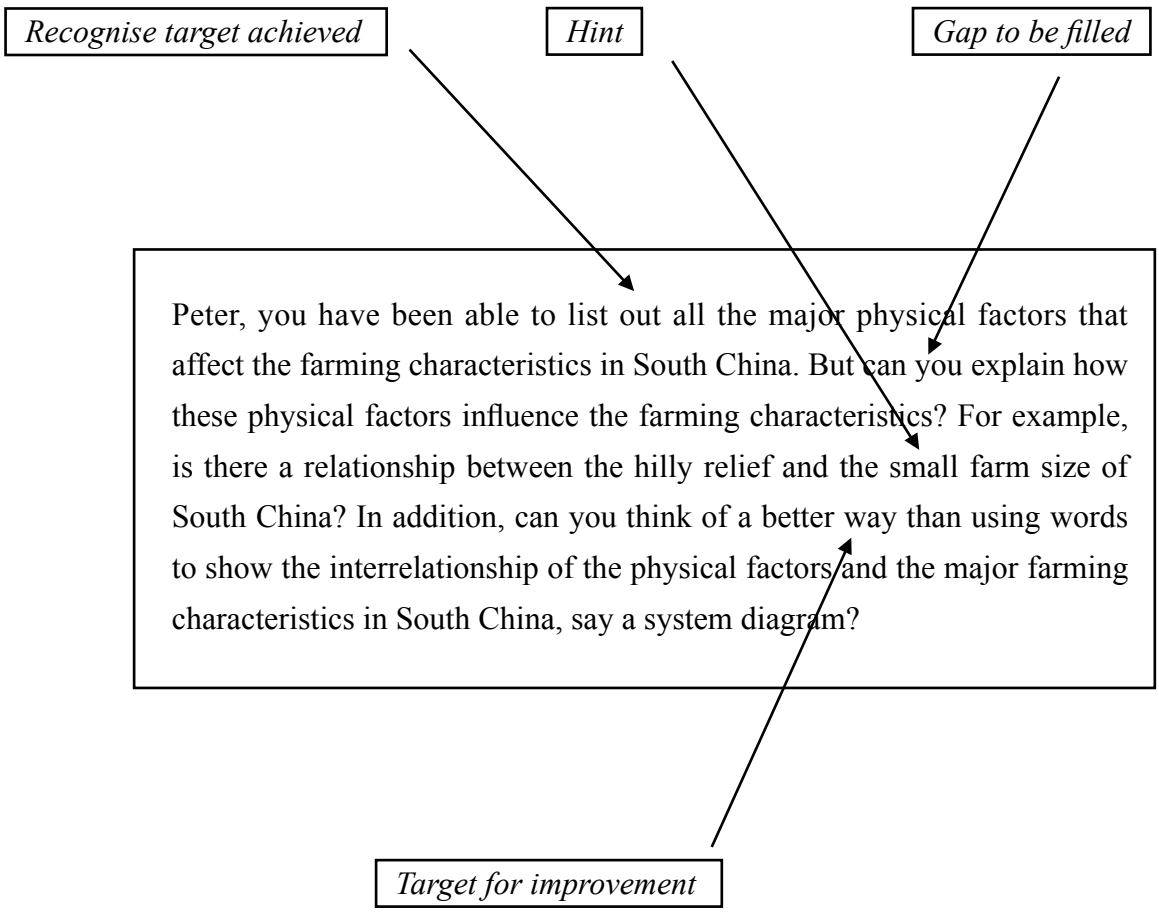

Figure 5.1 An example of quality feedback

5.3.3 Self-assessment

Assessment for learning involves the use of classroom assessment to improve learning. Student's self-assessment is one part of such formative classroom assessment. It involves students analyzing their own work and reflecting on their learning process, in particular the difficulties encountered and the outcomes achieved. It is also advisable to request student to lay down targets for further progress or improvement.

Some steps and suggestions are shown below:

(a) Teachers should give training sessions on self-assessment to their students at the beginning of a school year. During these class sessions, teachers should:
  (i) clarify what is meant by self-assessment;
  (ii) explain the objectives of learning clearly;
  (iii) inform students that self-assessment will become part of their classroom life;
  (iv) introduce self-assessment strategies to students and emphasise how these strategies can aid their learning;

(b) Teachers should invite their students to participate in the development of standards / criteria for self-assessment.

(c) Teachers should help their students to understand the criteria so that they are capable of evaluating their own work.

(d) Before doing each task, teachers should explain the learning objectives behind the task.

(e) Teachers should use the results of self-evaluation as a part of the final marks to a piece of work. Teachers should also discuss the work and its assessment with the students. These help students to understand the criteria better and in turn facilitate a smoother implementation of self-assessment in the coming lessons. Besides, new targets can be added if deemed necessary upon mutual agreement between teachers and their students after assessment.

(f) Teachers should encourage their students to have self-assessment frequently and consistently. Therefore, teachers should mark out time slots for these assessment activities.

To facilitate the implementation of self-assessment, teachers can design a learning journal for students to fill in after the completion of a teaching unit. The journal can help students to conduct self-evaluation of their own learning in a systematic way. Moreover, a collection of the journals over a period of time is a very valuable evidence of the learning progress of each individual student, which provides feedback to improve teaching strategies and to understand better the learning difficulties encountered by students. Figures 5.2 and 5.3 are two examples of learning journal used in local secondary schools for teacher reference.

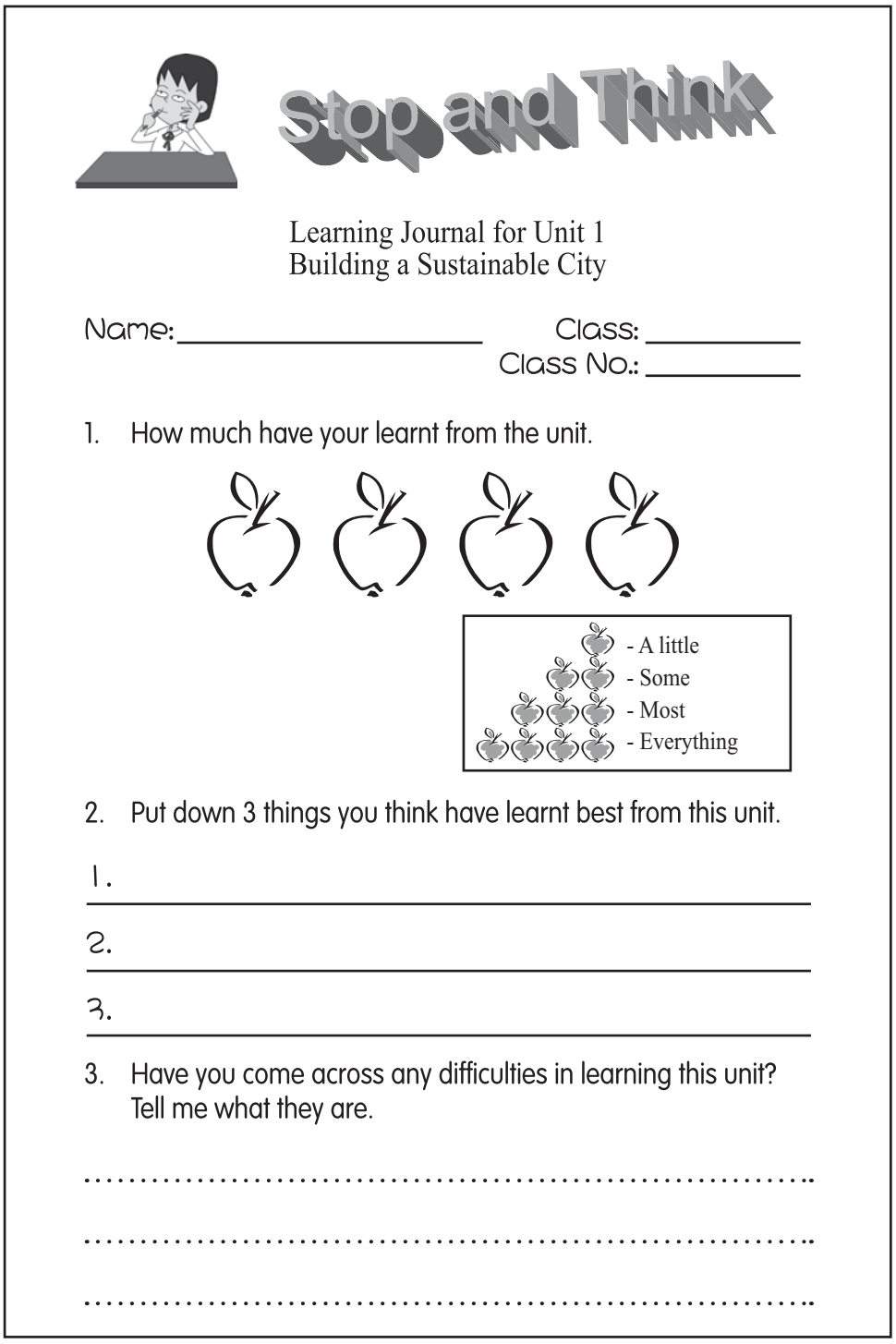

Figure 5.2 Example one of a learning journal

S2 Geography

Learning Journal for Unit 4 Lesson 1

Name: _____

Class & Class No.: _____

Date of Lesson: _____

---

1. I have learnt the following. (You can pick more than one)

☐ Definition of Overpopulation ☐ Problems caused by overpopulation in China

☐ Solutions adopted by China in handling overpopulation problem

☐ Read population pyramid ☐ Calculate dependency ratio

2. I still do not understand the following. (You can pick more than one)

☐ Definition of Overpopulation ☐ Problems caused by overpopulation in China

☐ Solutions adopted by China in handling overpopulation problem

☐ Read population pyramid ☐ Calculate dependency ratio

3. The following is the part that I found most difficult to understand.

_____

_____

4. To what extend I have understood the content of this lesson.

Very little			Full understood
1	2	3	4

5. Try to draw a diagram to show all you have learnt in this lesson.

Figure 5.3 Example two of a learning journal

Below are two more reminders for teachers intending to practice self-assessment in class. Firstly, the criteria for evaluating student performance must be made clear to every student such that the students know the aim of their work and how they can complete it successfully. These criteria may be a bit abstract, thus it is essential for teachers to provide concrete examples or sample scripts of previous student work to ensure thorough understanding.

Secondly, it is crucial to provide a safe and comfortable classroom atmosphere for students. Students should be reminded that the purpose of self-assessment is NOT fault-finding, but to help them to know how far they have gone in learning and how they can proceed or improve. Under no circumstances should a student be remembered, scolded or even punished by the teacher because she/he reveals something he/she do not understand after completing the lesson, even if the reason is because she/he did not pay attention in class.

5.3.4 Written Tests and Examinations

Tests and examinations are one of the common forms of assessment practiced in secondary schools. Various types of questions have been developed to solicit evidence about student learning, with the more common types include multiple-choice question, cloze (fill-in-the-blank) question, true-false question, matching question, short question and essay question. To decide which types of questions are to be included in the test/exam paper, the prime consideration will definitely be the objective of the assessment, that is, the learning outcomes the test/exam is intended to measure. An easy way to determine the question format will be focusing on the verb in the outcome statement being addressed. For example, an outcome that requires the student to 'recall' or to 'identify' can be assessed by using cloze or multiple-choice question. When it comes to requiring the student to 'compare' or to 'explain', then essay-type question will be an appropriate format.

Possible question format	Outcomes that require student to
Multiple-choice True-false Matching	recall, define, identify, distinguish, determine, calculate, select ……
Short essay Structured question Cloze	name, state, define, identify, calculate, determine, classify, describe ……
Essay Report	describe, explain, discuss, analyse, interpret, compare, contrast, evaluate, comment ……

Figure 5.4 Question format and the required learning outcomes

In preparing text/exam paper, it is important for teacher to ensure that the design is fair and can effectively reveal what the students know and are able to do. The followings are a few considerations for teachers in preparing test/exam items:

(a) Each item should focus on assessing the knowledge and skill of the students in one particular area. Students' performance should not be unduly influenced by their knowledge and skill in another area. For instance, a data-response question which requires students to read a number of news articles before they could figure out the type of natural hazard may be wrongly testing students' reading ability instead of their knowledge on natural hazard. Students with relatively lower reading ability will obviously be unfairly disadvantaged in this case.

(b) The language used in the question stem should be as simple and clear as possible. Teachers should note that students may fail to answer a question correctly because they fail to understand the language of the question. Consider the following question:

Describe the adverse impacts brought by climate change on people living in low-lying coastal areas.

Changing the term 'adverse impacts' to 'negative effects' or simply 'problems' can reduce the difficulty of the question and avoid the possibility of students failing to answer the question simply because they did not understand the difficult language term.

(c) In designing assessment items, teachers should avoid the inclusion of unfair tricks to trap students. A common example will be the use of negatively worded multiple-choice item like "Which of the following is not a correct cause of occurrence of sandstorm in China?" Students often miss the 'not' unless it is highlighted or underlined, and they will also be confused or trapped by the word 'correct' which is totally not necessary.

(d) In preparing test and examination papers for formal, summative assessment, a balance in the types of questions is necessary. Apart from elements of factual knowledge and skills, teachers should also pay attention to components involving understanding of principles and relationships, generalization and analysis. Teachers could develop a simple tabular form to help check the frequencies of different topics and types of questions appear in the test paper.

Topic	Cognitive Level										Total
	Recall		Comprehend		Apply		Analysis		Evaluate		
	Q. No.	Mark	Q. No.	Mark	Q. No.	Mark	Q. No.	Mark	Q. No.	Mark	Mark
Total											100
Unit 1 Sustainable City											
Subtopic 1											
Subtopic 2											
Subtopic 3											
Unit 2 Natural Hazards											
Subtopic 1											
Subtopic 2											
Subtopic 3											
Unit 3 Climate Change											
Subtopic 1											
Subtopic 2											
Subtopic 3											
Total											100

Figure 5.5 A checklist for setting test / examination paper

(e) Teachers are also reminded that data-response questions are particularly suitable for assessing abilities related to the interpretation and analysis of spatial information and decision-making in the study of geographical issues. It is advisable to incorporate a wide range of graphical and pictorial materials in the questions. Finally, questions which are directly copied from workbooks or textbook activities should not be used, to avoid situations in which students can score very high marks simply by rote memorisation of the answers given.

(f) Tests and examinations should not be used simply to rank students' performance. Summative tests/examinations can be used in a formative way. For example, students can be encouraged to reflect on their performance, note where they have done well and what they need to improve, and then develop their own revision plans for future improvement. Another possible approach is to ask students to work collaboratively in class to re-work test/examination answers based on the criteria developed for peer assessment and self-assessment as this can help them to understand better the aims of their learning and how they can perform more effectively in the future.

Chapter 6 Learning and Teaching Resources

Geography is a resource-rich secondary school subjects. The nature and the content of the subject, as well as its learning and teaching in secondary school classrooms, demand the use of a rich variety of resources. In addition to textbooks, worksheets, audio-visual materials, maps and charts, models, the Internet and computer software such as the GIS, teachers should also consider the use of the media, resources in the natural environment, and even people. Failing to make good use of this range is to abandon one of the key attractions that the subject has to offer.

The use of an extensive range of learning and teaching resources helps to broaden students' learning experiences and meet their varied learning needs. Their effective use enables students to:

- consolidate what they have learned;
- extend and construct knowledge for themselves; and
- develop appropriate learning strategies, generic skills, values and attitudes.

This chapter aims at outlining the range and sources of geographical resources that are commonly used in local secondary schools, and more importantly, discussing issues related to how these resources should be evaluated and used. Before going into the discussion of each individual type of geographical resources, there is a golden rule for every teacher to take note of. Very few, if not none, resources could be directly duplicated and used in classroom without proper modification.

6.1 Guiding Principles

When identifying and selecting resources, or designing and preparing new resource materials, it is very important for teachers to have a clear idea of the purpose for which they intend to use them. The development and use of resources should be determined by the nature of the learning and teaching strategies planned to achieve particular learning outcomes. Teachers are advised to refer to the principles for curriculum planning and for developing learning and teaching strategies included in Chapters 3 and 4 of this Guide.

Teachers should consider the following principles when preparing and selecting learning and teaching resources:

(a) The resource materials should be in line with the curriculum objectives and approach, and contain essential learning elements of the curriculum;
(b) They should arouse students' motivation and engage them in active learning;
(c) They should provide a variety of pathways for students to progress in their learning and support students' access to knowledge through scaffolding;
(d) They should cater for learner diversity by providing a variety of learning activities at different levels of difficulty;
(e) They should provide ample opportunities for students to enquire and learn through interaction with other people; and
(f) They should promote independent learning by complementing and extending what students have learned in class.

Teachers should ensure that there is a clear purpose for using resource materials and that these materials are carefully planned and well presented. They also need to be careful not to over-use or rely too heavily on them - "resource fatigue" can have an adverse effect on students' motivation to learn.

6.2 Textbooks

Even with the rapid development of e-resources, textbooks still remain as the most commonly used resource used in local secondary school classrooms. Undoubtedly, textbook, if well written, is a very handy resource that can provide a comprehensive source of learning and teaching materials, as well as a framework upon which teachers can easily developed their teaching schedules. However, teachers should not assume that finish teaching the whole set of textbooks is equivalent to covering the curriculum in full. Nor should they arrange their teaching sequence by simply following the chapter arrangement of the textbook. Curriculum delivery involves far more than just the coverage of specific subject content. Teachers have to give more thoughts to the ways in which learning activities, such as those found in textbooks, engage students in enquiry-based approaches to learning. Teachers should also strive to enhance the quality of students' thinking, and other outcomes from learning the subject, rather than just occupying them with activities and tasks from textbooks.

In selecting textbooks, it is advisable for geography teachers to consider the following questions:

(a) School and panel conditions

- *How many of your junior secondary geography teachers are non-geography specialists?*
- *Does the textbook provide plenty of examples and exercises for students that can also help non-specialist teacher to prepare their lessons?*
- *Do the textbook authors or editors provide help/advice to non-specialist teachers in the supplementary teacher manual/handbook?*
- *How many geography lessons per week does your school have?*
- *Is the textbook designed to facilitate students to read and study on their own in case you can only meet them once a week (e.g. comprises of self-contained learning units or provide sufficient reading materials)?*

(b) Content and organisation

- *How clearly are the key concepts and ideas presented?*
- *Is the level of difficulty suitable for your students' abilities?*
- *Is the content organised in a logical sequence?*
- *Does the content relate well to your students' prior knowledge?*
- *Does the textbook promote independent and enquiry learning?*

(c) Learning activities

- *Does the overall design of learning activities aims at catering for students' learning diversity?*
- *Does the textbook include a wide range of learning activities to facilitate the adoption of different learning and teaching strategies?*
- *Are the activities challenging enough or are they limited largely to mechanical copying or reading comprehension?*
- *Do the nature of the activities and the amount of structured guidance given suit the ability and needs of your students?*

(d) Language, layout and illustration

- *Is the level of difficulty of the language commensurate with the language ability of your students? Can most of your students read the textbook easily by themselves?*
- *Do you know that textbooks using simple words and basic phrasing to convey complex ideas need not be a disadvantage to the more able students?*
- *Have the language of the extracts from newspapers or other authentic secondary sources contained in the textbook been modified to suit the reading ability of your students?*
- *Does the textbook have an open layout, an attractive design, short line lengths and plenty of sub-sections to make it accessible to your students?*

- *Is the textbook rich in photographs and other visual resources?*
- *Do the illustrations adopted in the textbook contain far more information than is required? Can this information be easily identified, absorbed or interpreted by your students?*

(e) Others

- *Have the textbook authors and editors paid attention to bias and stereotyping in selecting photographs, cartoons and text? (e.g. All the board members of a multinational corporation are white men.)*
- *How much does the textbook cost? How durable is it? Will the publisher supply supplementary and updated information?*

The following are some useful documents which can be found in the website of the Education Bureau concerning the choice of textbooks for teachers' reference:

- Recommended Textbook List
- Guiding Principles for Quality Textbooks
- Notes on Selection of Textbooks and Learning Materials for Use in Schools

(http://www.edb.gov.hk/index.aspx?nodeID=2417&langno=1)

6.3 Information Technology Resources

The rapid advances in technology that can be used in education have changed the learning and teaching of geography in an unprecedented way. The introduction of the Internet in particular enables students to study anywhere and at any time. As students and teachers have to search for and handle an enormous amount of information and data, geography teaching without the use of technology is no longer desirable.

6.3.1 Using IT resources in Geography

The table below summarises some ways in which IT can contribute to and support the learning and teaching of geography.

Geographical learning activities	Information technology to be used	Examples of application
Enquiry and research • Statistical data • Information • Viewpoints	• The Internet and CD-ROMs * Geography-related websites * Links to experts * Electronic atlases, encyclopedias and newspapers	• Collect information about different cities in the world. • Find different viewpoints and arguments on climate change.
Mapping	• Map-drawing programmes • Geographic Information System (GIS)	• Map urban land use in the field and construct a land use map using GIS software.
Data recording and handling • Field study data • Data from research in secondary sources	• Data-logging equipment • Spreadsheet and database • Digital camera, video recorder and scanner	• Use data-logging equipment to record local weather data over a period of time. • Use a spreadsheet to calculate the changing employment figures in the manufacturing sector before and after industrial relocation.
Data and information presentation	• Word processing • Desktop publishing • Multimedia authoring • Presentation software	• Use a word processor to extract and edit useful information from an article downloaded from the Internet. • Develop a website on the school Intranet to display information and photographs on natural hazards in different parts of the world.

Geographical learning activities	Information technology to be used	Examples of application
Simulation and modelling	• Simulation and modelling software	• Use a simulation package to study how landslides occur.
Communication and exchange of information	• Electronic communication: * Email * The school Intranet * Chat rooms and bulletin boards on the Web	• Develop an e-learning platform in the school Intranet for teachers to communicate with students on a geography project. • Exchange ideas, information and data with students of other schools via email.

6.3.2 Geographic Information System (GIS)

Of the many IT tools available for the learning and teaching of geography, GIS is definitely the most subject-related and every geography student, regardless of his/her level, is entitled to know and use this IT tool. One possible way is to introduce GIS through a combination of teacher demonstrations and small group activities, followed by short revision and consolidation exercises. All the issues in this curriculum can incorporate some GIS activities to promote geographical enquiry, spatial analysis and the study of the inter-relationships between people and the environment. Teachers are advised to consult the "Skills" section of the tables on curriculum content in Chapter 2 when deciding how and where to introduce the GIS in their lessons.

There are also a number of GIS freeware available. These freeware, though rather limited in its function, offer a good entry point for teachers and students who are novices to GIS as the programme is far less complex, and thus much easier to use than the commercial GIS software. Google Map is a good example of this type of freeware. Teachers who are not too familiar with the use of commercial GIS can consider using these freeware to give their student a taste of what GIS is. For further information and guidelines on the use of GIS for the learning and teaching of geography, teachers can refer to the resource package "Using Geographic Information System (GIS) for Implementing Enquiry Learning in Geography" developed by the Education Bureau.

6.4 Developing School-based Learning and Teaching Resources

Geography teachers are used to developing their own learning and teaching resource materials - particularly worksheets - to cater for learner diversity and supplement materials already available in the market. They should take the following guidelines into account when preparing school-based materials to ensure that the materials are effective in supporting learning.

School-based materials should:

- provide additional information and/or comprise alternative learning activities to supplement textbooks or resources already in use; and
- put more emphasis on catering for variations in student ability, as ready-made materials are often aimed at students of average or even higher ability.

Finally, it needs to be emphasised again that the materials selected, of whatever type, should have a clear purpose and adoption should be based primarily on whether they can enhance learning of students.

6.5 Resource Management

6.5.1 Sharing of learning and teaching resources

A culture of sharing is the key to the success of knowledge management. Schools should make arrangements for:

- teachers and students to share learning and teaching resources through the Intranet or other means within the school; and
- teachers to form professional development groups for the exchange of experience.

The multi-disciplinary nature of geography makes it unique in bridging the social sciences with the natural sciences. As such, there will obviously be plenty of opportunities for geography teachers to work with teachers of other subjects, including the sharing of workload and resources. Currently, some geography teachers in local secondary schools have been collaborating with their science colleagues in numerous projects on climate change and weather data recording. Geography teachers will be responsible for training participating students (and even colleagues) on the knowledge on weather and climate, while science teachers will provide training on statistics analysis and data-logging equipment for recording. In some other cases, geography and science teachers of the same school work on a joint project on environmental pollution and various learning and teaching resources, like pH paper, environmental testing kits, and even laboratory are shared among panels.

6.5.2 Managing the use of the geography room

Quality learning and teaching of geography in secondary schools requires considerable resources and equipment which are unique to the subject, e.g. globes, meteorological instruments, field study instruments, and various kinds of maps and aerial photographs. The geography room should provide a spacious environment for their storage and effective use.

The room also supports fieldwork enquiry - an essential part of the Geography curriculum which should be carried out regularly - serving as a base for planning, preparation, briefing, data processing, discussion and debriefing, and for proper storage of various kinds of fieldwork equipment.

In view of the increasing use of information technology in geography lessons, the room should be equipped with desktop computers, GIS software, printers, CD-ROMs and digital maps. It is advisable for teachers to plan in detail how the geography room can be used as a GIS learning and teaching centre not only for geography but also for other subjects in which the GIS and other electronic resources can help to enhance learning. A special timetable should be prepared for the use of the geography room, so that its resources, equipment and furniture can be used as effectively as possible.

Students should also be encouraged to use these resources for self-study during lunch time or after school or for geography-related extra-curricular activities. The room can also be an appropriate place for cross-curricular activities, such as a joint workshop with science students on the use of GIS software for analysis of the microclimate of Hong Kong.

Appendix 1

A School Example of Tailoring the S1-3 Geography Curriculum for Adoption into an Integrated PSHE Curriculum

The purpose of this exemplar is to illustrate how schools adopting the mixed mode in structuring their junior secondary PSHE curriculum tailor-make their S3 Geography curriculum.

The junior secondary PSHE curriculum of the case school includes Chinese History, Integrated Humanities, History and Geography. Chinese History is offered as independent subject from S1 to S3. For S1 and S2, the school also offers Integrated Humanities (IH), and in S3, the subject is replaced by History and Geography.

Planning of an One-Year S3 Geography Curriculum

Step 1: Curriculum Auditing

(a) Identify the basic geographical knowledge and concepts that have been covered by the S1-2 IH curriculum

- The teachers of the case school examined their S1-2 IH curriculum and identify those topics that contain the basic geographical knowledge and concepts required by the S1-3 Geography curriculum.
- Teachers then assessed whether these knowledge and concepts are fully or partly covered.
- Table 1 shows the curriculum auditing of basic geographical knowledge and concepts completed by the case school.

(b) Identify the core geographical skills that have been covered by the S1-2 IH curriculum

- Teachers repeat step 1(a) above but this time the focus is on the core geographical skills
- Table 2 shows the curriculum auditing of the core geographical skills completed by the case school.

Knowledge and Concepts	S1 Why can our local district & HK develop?	S1 Evaluate the future development of our local district	S2 Is HK a metropolitan city?	S2 The Provinces of China	S2 Physical Environment of China	S2 Weather and Climate	S2 Issue Enquiry: Sustainable Development	S2 Case Study: Three Gorges, Chiang Jiang	S2 The influence of Globalization on HK
Space 1. The location of places and landscapes, including why they are there, the patterns and distributions they created, how and why these are changing and their implications for people	❊ Location of places in Hong Kong	❊ Location of Kai Tak		❊ Provinces of China	❊ Location of the different mountains in China			❊ Location of Chang Jiang	
2. The distribution of major physical and human patterns at different scales (local to global)	❊ Landuse pattern in Hong Kong				❊ Distribution of relief in China	❊ Climatic characteristics in China HK → China		✓ Characteristics of Chang Jiang	❊ Distribution of Trans-national companies
3. The geographical processes that created the distribution of major physical and human patterns and their interactions across space						✓ Factors affecting climatic characteristics			❊ Reasons for their distribution
Place and Region 1. The physical and human characteristics of places	❊ Human characteristics only (Landuse)	❊ Human characteristics only (urban development)	❊ Human characteristics only (economic characteristics)		❊ Physical characteristics of China	❊ Climatic characteristics in China			
2. The physical and human processes that shape places						❊ Physical processes that shape the climatic characteristics			
3. The concept of region as an area of Earth's surface with unifying geographic characteristics									
4. The similarities and differences among regions									
People-Environment Interaction 1. The ways in which regions change and the factors contributing to these changes		✓ urban redevelopment						✓ Water problem in Chang Jiang	❊ Changing locational

Table 1 Curriculum auditing - basic geographical knowledge and concepts (continue to the next page)

Knowledge and Concepts	S1 Why can our local district & HK develop?	S1 Evaluate the future development of our local district	S2 Is HK a metropolitan city?	S2 The Provinces of China	S2 Physical Environment of China	S2 Weather and Climate	S2 Issue Enquiry: Sustainable Development	S2 Case Study: Three Gorges, Chiang Jiang	S2 The influence of Globalization on HK
									pattern of industry / Trans-national companies
2. The effects of the characteristics of physical environments and processes on human activities						✓ Effects of climate on human activities		✓ Effects of flooding in Chang Jiang	
3. Human responses to variations and changes in physical environments									
4. Human modification of the physical environment, and its consequences on places and environments								✓ Three Gorges Project in Chang Jiang	
Sustainable Development 1. The meaning of sustainable development and how it is implemented in different places and different occasions		✓ Kai Tak redevelopment					❊ Meaning of sustainable development	✓ Three Gorges Project in Chang Jiang	
2. Major local, national and global environmental issues, including their causes, the tension involved, and how they can be managed in a sustainable way		❊ Local case only						✓ National issue	
Global Interdependence 1. The economic, environmental, political and social interactions among places and regions									
2. The changes caused by human action in one place leading to changes in other places									
Areal coverage 1. Hong Kong	✓	✓	✓						
2. China				✓	✓	✓	✓	✓	
3. Asia									
4. World									✓

❊ partially covered ✓ fully covered ☐ Missing basic geographical knowledge and concepts

Table 1 Curriculum auditing - basic geographical knowledge and concepts

Core geographical skills	S1 How do we know where we are?	S1 When do people move into HK?	S1 How is the life of the local residents?	S1 Why can our local district & HK develop?	S1 Evaluate the future development of our local district	S2 The Provinces of China	S2 Physical Environment of China	S2 Weather and Climate	S2 Case Study: Three Gorges, Chiang Jiang	S2 The influence of Globalization on HK
Geographical Enquiry Skills 1. Identify geographical issues and ask / pose geographical questions					✓ Make use of the 6Ws to ask questions				✓ Make use of the 6Ws to ask questions	❋
2. Select and extract geographical data from a range of sources					✓				✓	✓
3. Organise and present geographical data in appropriate formats using appropriate techniques for summarising					✓				✓	✓
4. Observe and interpret patterns, trends and relationships from processed geographical data										
5. Make inferences / generalisations and draw conclusion from analysed geographical information and data					✓				✓	✓
Map skills 1. Read maps of different kinds and at different scales	✓ 3 types of scale	✓ Read maps of different scales	✓ Read floor plan	✓ Read large scale maps	✓ Read outline zoning map	✓ Read outline maps	✓ Read relief map	✓ Climatic map	✓	
2. Find specific information in an atlas by using the index and contents pages	✓			✓		✓	✓		✓	
3. Locate specific features and places on a map using coordinates and references	✓ Longitudes & latitudes, grid references				✓					

Table 2 Curriculum auditing - core geographical skills (continue to the next page)

Core geographical skills	S1 How do we know where we are?	S1 When do people move into HK?	S1 How is the life of the local residents?	S1 Why can our local district & HK develop?	S1 Evaluate the future development of our local district	S2 The Provinces of China	S2 Physical Environment of China	S2 Weather and Climate	S2 Case Study: Three Gorges, Chiang Jiang	S2 The influence of Globalization on HK
4. Measure distances and areas on maps using linear scale and RF	✓									
5. Identify and describe spatial patterns on a map							✓ Relief pattern			
6. Construct an annotated cross-section from a contour map							❋ Interpret cross-section			
7. Calculate the gradient of a slope										
8. Interpret a contour map to describe the relief of an area and identify landform features shown on the map							✓			
9. Use GIS software to organise geographical data and to construct a simple map										
Fieldwork skills 1. Follow a route on a given map in the field, and be able to identify conspicuous features from the information shown										
2. Use a variety of skills to measure, map and record geographical phenomena and data in the field										
3. Use a variety of tools to measure, collect and record geographical data in the field										
4. Draw annotated field sketch to record and interpret geographical information										
5. Undertake sampling in the field										

Table 2 Curriculum auditing - core geographical skills (continue to the next page)

Core geographical skills	S1 How do we know where we are?	S1 When do people move into HK?	S1 How is the life of the local residents?	S1 Why can our local district & HK develop?	S1 Evaluate the future development of our local district	S2 The Provinces of China	S2 Physical Environment of China	S2 Weather and Climate	S2 Case Study: Three Gorges, Chiang Jiang	S2 The influence of Globalization on HK
Skills of using graphs, statistics and photographs 1. Identify and calculate totals, averages, frequencies, ranges, densities, ratios and percentages										
2. Construct and interpret pie charts, bar, column, line, climatic and proportional graphs				✓ Pie chart						
3. Construct flow diagrams to illustrate inputs, outputs, elements, feedbacks and other aspects of geographical systems										
4. Read and interpret oblique, aerial, ground-level and satellite imagery		✓ Ground-level & oblique photos	✓ Aerial photo	✓ Ground-level & oblique photos						
5. Recognise features and patterns shown in an aerial photograph and identify them on a map of the same area										
6. Read simplified weather charts								✓		

❋ partially covered ✓ fully covered ☐ Missing core geographical skills

Table 2 Curriculum auditing - core geographical skills

(c) Identify the missing essential learning elements

- Based on the results from Table 1 and Table 2, teachers identified the essential learning elements that were not included (Table 3) in the S1 and S2 IH curriculum.

Basic geographical knowledge and concepts that are completely missing	**Core geographical skills that are completely missing**
1. Place and Region - The concept of region as an area of Earth's surface with unifying geographic characteristics 2. Place and Region - The similarities and differences among regions 3. People-Environment Interaction - Human responses to variations and changes in physical environments 4. Global Interdependence - The economic, environmental, political and social interactions among places and regions 5. Global Interdependence - The changes caused by human action in one place leading to changes in other places	1. Geographical enquiry skills - Observe and interpret patterns, trends and relationships from processed geographical data 2. Map skills - Calculate the gradient of a slope 3. Map skills - Use GIS software to organise geographical data and to construct a simple map 4. All the fieldwork skills 5. Skills of using graphs, statistics and photographs - Identify and calculate totals, averages, frequencies, ranges, densities, ratios and percentages 6. Skills of using graphs, statistics and photographs - Construct flow diagrams to illustrate inputs, outputs, elements, feedbacks and other aspects of geographical systems 7. Skills of using graphs, statistics and photographs - Recognise features and patterns shown in an aerial photograph and identify them on a map of the same area

Table 3 Basic geographical knowledge and concepts and core geographical skills that are completely missing

- Teachers of the case school found out that some essential learning elements were only weakly developed by the IH topics. To compensate for the loss, these elements would be emphasised in the S3 Geography curriculum. Teachers also put down their perceptions and observations on the overall competency of the IH curriculum in offering geography essential elements to the students, as shown in Table 4.

Essential learning elements weakly developed	Overall observation
1. The factors explaining the location of places and landscapes 2. Geographical processes that created the distribution pattern 3. Human processes that shape places 4. Global environmental issues	1. The curriculum content covers mainly factual knowledge and some elementary geographical concepts. 2. There is little coverage on the reasons or processes in creating these patterns. 3. There is a lack of global perspective. Global issues are missing. 4. Students have no fieldwork experiences and no chance of learning fieldwork skills. 5. There is no chance for the training of statistical skills.

Table 4 Essential learning elements that are weakly developed and overall observation

Step 2: Curriculum Planning for S3 Geography

(a) Identify possible modules to cover the missing essential learning elements

- Based on Table 3, teachers of the case schools identified modules included in the revised S1-3 Geography curriculum that included the essential learning elements which had not been covered by their S1-2 IH curriculum (refer to Table 5 and Table 6).

(b) Select appropriate modules to be included in the S3 curriculum

- By referring to Tables 5 and 6, teachers of the case school identified appropriate modules from the revised S1-3 curriculum that covered the missing basic geographical knowledge and concepts and core geographical skills (Table 7).

- By avoiding the three topics “climate”, “water” and “industry” that have already been covered in S1-2 IH curriculum, seven modules were chosen for structuring the one-year S3 Geography curriculum (Table 8).
- Teachers can choose the appropriate topics from Table 8 according to the interest of the students, the time available and the preference of the teachers.
- In the end, three modules, namely “Natural Hazards”, “Food” and “Energy” were chosen to make up the S3 curriculum. Either one of the remaining modules is used as topic for project learning.
- The reason for choosing the three modules:
  * The module “Natural Hazard” is from Section A of the revised S1-3 Geography curriculum, while the one on “Food” is from Section B and the one on “Energy” is from Section C. This represents a full coverage of issues with emphasis on local, national and global scale respectively, which provides a broad and balance areal coverage for the study of junior secondary geography.
  * All three are core modules in the S1-3 curriculum, covering most of the essential learning elements.
  * The module “Desertification”, which is of higher priority than the modules “Natural Hazards”, is dropped because the latter topic can better illustrates the major concepts involved in a physical environment that are weakly developed in the S1-2 IH curriculum. In addition, those missing core geographical skills can be covered by the other two selected modules.
  * Either one of the four modules, “Desertification”, “Ocean”, “Population” and “Disease” is used for project learning because they are interesting and new to most students. These modules help illustrate the strong relevancy of geography to the daily life and direct experience of the students.

	City	Natural Hazards	Climate	Tourism	Food	Water	Industry	Energy	Population	Desertification	Disease	Ocean
Space												
1. The location of places and landscapes, including why they are there, the patterns and distributions they created, how and why these are changing and their implications for people	✓	✓		✓	✓	✓	✓	✓	✓	✓		
2. The distribution of major physical and human patterns at different scales (local to global)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. The geographical processes that created the distribution of major physical and human patterns and their interactions across space	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Place and Region												
1. The physical and human characteristics of places	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
2. The physical and human processes that shape places	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
3. The concept of region as an area of Earth's surface with unifying geographic characteristics		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
4. The similarities and differences among regions		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
People-Environment Interaction												
1. The ways in which regions change and the factors contributing to these changes			✓		✓		✓		✓	✓	✓	✓
2. The effects of the characteristics of physical environments and processes on human activities	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Human responses to variations and changes in physical environments	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4. Human modification of the physical environment, and its consequences on places and environments	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sustainable Development												
1. The meaning of sustainable development and how it is implemented in different places and different occasions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓

Table 5 Basic geographical knowledge and concepts that have been covered by different modules in S1-3 Geography curriculum (continue to the next page)

	City	Natural Hazards	Climate	Tourism	Food	Water	Industry	Energy	Population	Desertification	Disease	Ocean
2. Major local, national and global environmental issues, including their causes, the tension involved, and how they can be managed in a sustainable way	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Global Interdependence												
1. The economic, environmental, political and social connections among places and regions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. The changes caused by human action in one place leading to changes in other places	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Basic geographical knowledge and concepts that are completely missing

Modules that covered all those missing basic geographical knowledge and concepts

Table 5 Basic geographical knowledge and concepts that have been covered by different modules in S1-3 Geography curriculum

	City	Natural Hazards	Climate	Tourism	Food	Water	Industry	Energy	Population	Desertification	Disease	Ocean
Geographical Enquiry Skills												
1. Identify geographical issues and ask / pose geographical questions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Select and extract geographical data from a range of sources	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Organise and present geographical data in appropriate formats using appropriate techniques for summarising	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4. Observe and interpret patterns, trends and relationships from processed geographical data	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5. Make inferences / generalisations and draw conclusion from analysed geographical information and data	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Map Skills												
1. Read maps of different kinds and at different scales	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Find specific information in an atlas by using the index and contents pages	✓		✓			✓	✓		✓	✓	✓	✓
3. Locate specific features and places on a map using coordinates and references	✓			✓		✓	✓			✓		✓
4. Measure distances and areas on maps using linear scale and RF				✓	✓					✓	✓	
5. Identify and describe spatial patterns on a map	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6. Construct an annotated cross-section from a contour map		✓				✓						
7. Calculate the gradient of a slope		✓				✓						
8. Interpret a contour map to describe the relief of an area and identify landform features shown on the map		✓			✓	✓						
9. Use GIS software to organise geographical data and to construct a simple map	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Table 6 Core geographical skills that have been covered by different modules in S1-3 Geography (continue to the next page)

	City	Natural Hazards	Climate	Tourism	Food	Water	Industry	Energy	Population	Desertification	Disease	Ocean
Fieldwork Skills												
1. Follow a route on a given map in the field, and be able to identify conspicuous features from the information shown	✓				✓	✓				✓		✓
2. Use a variety of skills to measure, map and record geographical phenomena and data in the field	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓
3. Use a variety of tools to measure, collect and record geographical data in the field			✓		✓	✓	✓			✓		✓
4. Draw annotated field sketch to record and interpret geographical information	✓				✓	✓				✓		
5. Undertake sampling in the field	✓	✓		✓	✓		✓	✓		✓		
Skills of using graphs, statistics and photographs												
1. Identify and calculate totals, averages, frequencies, ranges, densities, ratios and percentages	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
2. Construct and interpret pie charts, bar, column, line, climatic and proportional graphs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Construct flow diagrams to illustrate inputs, outputs, elements, feedbacks and other aspects of geographical systems					✓	✓	✓	✓		✓		✓
4. Read and interpret oblique, aerial, ground-level and satellite imagery	✓	✓	✓		✓	✓		✓		✓		✓
5. Recognise features and patterns shown in an aerial photograph and identify them on a map of the same area				✓				✓		✓		
6. Read simplified weather charts		✓	✓							✓	✓	

Core geographical skills that are completely missing

Table 6 Core geographical skills that have been covered by different modules in S1-3 Geography

Modules that cover all the missing basic geographical knowledge and concepts:	Modules that cover most of the missing core geographical skills:	Topics that have been covered in S1-2 IH curriculum:
• Natural Hazards • Climate • Food • Water • Industry • Energy • Population • Desertification • Disease • Ocean	• Food (covers 9 missing core geographical skills) • Water (covers 9 missing core geographical skills) • Desertification (covers 9 missing core geographical skills) • Industry (covers 7 missing core geographical skills) • Energy (covers 7 missing core geographical skills) • Natural Hazards (covers 6 missing core geographical skills) • Ocean (covers 6 missing core geographical skills) • Climate (covers 5 missing core geographical skills) • Population (covers 3 missing core geographical skills) • Disease (covers 3 missing core geographical skills)	• Climate • Water • Industry

Table 7 Selection of Appropriate Modules

Suggested modules (in order of priority)	Points to note
Food #	• More emphasis should be put on how the problems in LDC differ from the condition in Mainland China and how these problems can be solved. This can bring out the similarities and differences between places and regions and how human responds to variations and changes in physical environment. • GIS and graphical skills can be taught. • Fieldwork can be carried out. • Construct a flow diagram to show the operation of a farming system.
Desertification	• More emphasis should be put on the relationship between human activities and desertification. • Teacher should also point out that the problem is not a localised one but can affect other places in distant region. This can bring out the concept of global interdependence. • Examples from Australia can be taught to balance the coverage of case studies. • Teacher can help students to interpret satellite images and construct map with GIS. • Fieldwork can be carried out.
Energy #	• More emphasis should be put on the global distribution of energy resources and the global pattern of energy production and consumption. • How the concept of sustainable development can be implemented in a global issue. • GIS and graphical skills can be taught.
Natural Hazards #	• More emphasis should be put on the global distribution of major natural hazards so as to enhance students' global perspectives. • The part on "typhoon" can be omitted because it has been taught in S2 IH. • More emphasis should be put on how human responds to these hazards.

Table 8 Modules that can be included in the S3 Geography curriculum (continue to the next page)

Suggested modules (in order of priority)	Points to note
	• Examples from other places can be quoted to extend their exposure to the world. • Teacher should teach students how to calculate the gradient of the slope. • GIS and statistical skills can be taught.
Ocean	• More emphasis should be put on the global distribution of oceans and seas so as to give students a global distribution pattern. • The concept of ecosystem can be brought out. Flow diagram can be constructed to illustrate the concept of inputs, outputs, processes and feedback. • How the concept of sustainable development can be implemented in a global issue. • Graphical and statistical skills can be taught. • Fieldwork can be carried out.
Population	• By looking at the distribution of population in China and the population problems in MDC and LDC, students can understand the similarities and differences among regions. • GIS and statistical skills can be taught.
Disease	• By looking at the patterns of spread and distribution of infectious diseases, students are able to get a better understanding of the concept "global perspective". • By looking at the response and risk-taking behaviours of people at different infected areas, students can understand how people respond to variations and changes in physical environments. • GIS and statistical skills can be taught.

Core modules in the revised S1-3 Geography curriculum

Table 8 Modules that can be included in the S3 Geography curriculum

Appendix 2

Reference and Resource List for Teachers

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K. World-Wide Web Site Addresses

1. Websites about Geographical education

Address	Name of Homepage	Details
http://www.qca.org.uk	Qualifications and Curriculum Authority - Innovating with geography	Official website containing comprehensive information on geography curriculum and assessment in England and Wales.
http://www2.glos.ac.uk/gdn/seda/	Paper 89 published by Staff and Education Development Association, U.K.	A collection of articles on the title "Developing Skill-based Curricula through the Disciplines: Case Studies of Good Practice in Geography".
http://www.rgs.org/	Royal Geographical Society	The site contains update information about geographical education in U.K. and also some good articles on learning and teaching geography.
http://www.geography.org.uk	Geographical Association	The official website of the association which contains information on the latest development of the subject and lots of useful resources.
http://www.aag.org/	Association of American Geographers	Viewers should not miss the 'Annals' Section included in the 'Publications' Section of the website.

2. General websites about the learning and teaching of Geography

Address	Name of Homepage	Details
http://geographyworldonline.com/	Geography World	This site covers many different parts of geography. It provides linkages to a large amount of learning and teaching resources in geography, e.g. geography games, quizzes and news etc.
http://geography.about.com/od/studygeography/a/geog101.htm	Geography 101	This homepage includes a lot of information and links of nearly all topics in geography. Besides, many maps, photos and clip arts related to geography are also provided.
http://www2.lib.udel.edu/subj/geog/internet.htm	Internet Resources for Geography & Geology	A great site which provides a lot of links to a wide range of geography-related topics. Lesson plans, educational software and online field trips around the world are also included.
http://www.nationalgeographic.com	Geography Education, National Geographic Society	Geography-related lesson plans and classroom activities are provided in this homepage.
http://library.thinkquest.org/10157/geoglobe.html	Geo-Globe	The Geo-Globe site contains many games related to geography.

Address	Name of Homepage	Details
http://www.geographyinthenews.rgs.org	Geography in the News	This website contains geography-related news which is a good and updated resource for enquiry learning in Geography lessons.

3. Specific websites about maps

Address	Name of Homepage	Details
http://www.maps.com	Maps.com - The Place for Maps Online	Online world maps, online map games and information about map skills can be found in this website.
http://www.centamap.com	Centamap	A very useful website which contains maps of different parts of Hong Kong.
http://www.ypmap.com/eng	YP Map	This website contains a lot of useful maps of Hong Kong. Besides street maps, weather maps and census maps can also be found.
http://maps.google.com	Google Maps	A great website which includes maps and satellite photos of different parts of the world.
http://www.google.com/earth/index.html	Google Earth	A very useful website which provides 3D/ satellite images of the world. Viewers can see historical maps, weather patterns and ocean floor with Google Earth. Location and details of field trips can also be recorded in it for further analysis.
http://www.nationalgeographic.com/maps	National Geographic - Maps and Geography	'MapMachine Online Atlas' is included in this website. It contains different types of digital maps, such as street-level maps, topographic maps and maps related to environment, natural hazards and weather.
http://www.eduplace.com/ss/maps	Education Place - Outline Maps	This website provides various outline maps (pdf files) for printing and use in classrooms.

4. Specific websites for the Compulsory Modules:

Using Urban Space Wisely—Can we maintain a sustainable urban environment?

Address	Name of Homepage	Details
http://www.ura.org.hk/	Urban Renewal Authority	Information about urban renewal in Hong Kong can be found in this website. Case studies are also included.
http://www.susdev.gov.hk/	Sustainable Development	This official site of the government of the Hong Kong SAR includes basic concepts and related policies of sustainable development in Hong Kong and other parts of the world. A "Sustainable Development Online Resource Centre" can be found on the site which includes a lot of information and educational materials for the learning and teaching of the concepts of sustainable development.
http://www.curb.com.cn	中國城市化	A good website providing lots of information about urban development in China.
http://www.pland.gov.hk/	Planning Department	This is the official website of the Planning Department of the Hong Kong SAR. The "planning studies" in this site contains useful case studies for the learning and teaching about urban planning in Hong Kong.
http://www.defra.gov.uk/sustainable/government/index.htm	UK Governmennt Sustainable Development	This site introduces how UK government develop her city sustainably and how the policy helps sustainable development.
http://sustainablecities.dk/en/cases?view=cases-comments	Sustainable Cities	This is a database providing knowledge on the sustainable planning of cities and cases studies.

Living with Natural Hazards—Are we better equipped than the others?

Address	Name of Homepage	Details
http://www.usgs.gov/hazards/	Nature Hazards	A resourceful website about natural hazards. Current natural hazards are reported with maps. Besides, it provides many useful resources, e.g. graphics, photos, animations, lesson plans and learning activities, for the learning and teaching of earth structure, earthquakes and plate tectonics.
http://www.crustal.ucsb.edu/ics/understanding/	Understanding Earthquakes	This website contains earthquake information, quiz and animations.
http://earth.fg.tp.edu.tw/learn/eq/main.htm	認識地震	This site provides information about earthquakes, especially the case of Taiwan.

Address	Name of Homepage	Details
http://earthobservatory.nasa.gov/	NASA Earth Observatory	The site contains the images, stories, and discoveries about climate and the environment that emerge from NASA research, including its satellite missions, in-the-field research and climate models.
http://hkss.cedd.gov.hk/hkss/index.htm	Hong Kong Slope Safety	It includes information, educational materials and interactive games concerning slope safety and maintenance.
http://earthobservatory.nasa.gov/NaturalHazards/	Earth Observatory	This site provides the latest information of various types of natural hazards occurred around the world.
http://www.geography.learnontheinternet.co.uk/topics/tropstorm.html	Internet Geography - tropical storms	A useful website with comprehensive information about tropical storms.

Food Problems—Can We Feed Ourselves?

Address	Name of Homepage	Details
http://www.ucc.ie/famine/	International Famine Centre Homepage	It contains the latest famine news of the world. Links to other websites about "famine" are also included.
http://www.oxfam.org.hk	Oxfam	Information about development and poor can be found in this website.
http://www.fao.org/index_en.htm	Food and Agriculture Organization of the United Nations	It contains useful information about food and agriculture in the world, such as the situation of food crisis and sustainable development.
http://worldfoodchina.com/	World Food China	A site contains information and news about food and agriculture in China.
http://www.greenpeace.org/china/en/campaigns/food-and-agriculture	Green Peace China, Agriculture	A site introduces the situation of agriculture in China.
http://news.bbc.co.uk/2/hi/in_depth/africa/2006/africa_food_crisis/default.stm	BBC News - Africa's food crisis	A news archive on the food problems in Africa.
http://www.angelfire.com/mac/egmatthews/worldinfo/problems/famine.html	Famine Page	A collection of short articles on famine in Africa. Useful for 'reading to learning'.

The Trouble of Water—Too Much and Too Little

Address	Name of Homepage	Details
http://www.ctgpc.com	China Three Gorges Corporation	This site provides nearly all necessary information for the learning of the Three Gorges Project, such as its benefits and measures of environmental protection.
http://factsanddetails.com/china.php?itemid=390&catid=10&subcatid=66	Fact and Details - Water Shortages in China	This site contains information about water problem in China. It also provides links and resources about China's environment.
http://www.yellowriver.gov.cn/eng	Yellow River Conservancy Commission	A useful website provides the latest news about hydrological project in China. It also contains photo gallery and visual resources.
http://www.geography.learnontheinternet.co.uk/topics/flooding.html	Internet Geography - flooding	A rich resource website on river which provides a number of case studies on flooding.
http://www.oxfam.org.uk/education/resources/water_for_all/	Oxfam Education - water for all	This site contains a comprehensive pool of learning resources on the issue 'water'.
http://www.unescap.org/drpad/publication/integra/modalities/bangladesh/4bl000ct.htm	The United Nations Economic and Social Commission for Asia and the Pacific- Flooding in Bangladesh	A rich site containing plenty of information about flooding in Bangladesh.
http://www.geographypages.co.uk/flood.htm	Geography Pages - UK flood resources	A useful site containing a lot of learning resources for studying flooding in UK.
http://www.pub.gov.sg/Pages/default.aspx	PUB, Singapore's national water agency	An official website about water management in Singapore. Don't miss the parts about NEWater and Marina Barrage.

Global Shift of Manufacturing Industry—Opportunities and threats

Address	Name of Homepage	Details
http://www.geography.org.uk/download/GA_RECareersDearneBusinessActivity.pdf	Geographical Association - Resources	A well designed learning activity for studying industrial decline in South Yorkshire, U.K.
http://www.geographyteachingtoday.org.uk/ks3-resources/resource/china-today/made-in-china/	Geography Teaching Today: Made in China	A set of lesson plans on China industry.

Address	Name of Homepage	Details
http://info.hktdc.com/mktprof/china/prd.htm	Hong Kong Trade Development Council - Pearl River Delta Economic File	Well summarised information about the economic conditions, including manufacturing industry, of the Pearl River Delta Region.

Scramble for Energy

Address	Name of Homepage	Details
http://energymarine.com/	Energy Marine	It is a resourceful website which contains news about energy of different countries.
http://re.emsd.gov.hk/	EMSD HK RE NET	This site is about renewable energy in Hong Kong. Besides, it provides educational resources.
http://www.energyland.emsd.gov.hk/eng/index.htm	EMSD Energy Land	It is a fancy websites providing useful resources about energy.
http://tonto.eia.doe.gov/kids/energy.cfm?page=6	EIA Energy Kids - For Teachers	This site is about energy and designed for teachers. It contains lesson plans, teacher guide and photo gallery.
http://www.energy.gov/about/index.htm	Department of Energy Homepage	This is the official website of Department of Energy in U.S. Information about energy saving strategies are included.

5. Specific websites for the Elective Modules:

Tourists—Friends or foes?

Address	Name of Homepage	Details
http://www.discoverhongkong.com/	Discovery Hong Kong - Official Travel Guide from Hong Kong Tourism Board	This is the official travel guide created by Hong Kong Tourism Board. It contains information about tourists spot in Hong Kong.
http://geopark.gov.hk/	Hong Kong Geopark	The official website of Hong Kong Geopark. This site introduces the park and the geological environment in Hong Kong.
http://www.gdrc.org/uem/eco-tour/st-whatis.html	The Sustainable Tourism Gateway	This site provides information about sustainable tourism. It also collects journals and cases about tourism.
http://www.sustainabletourism.net/index.html	Sustainable Tourism.net	This is a resourceful website about sustainable tourism. The resources and cases studies are very useful.

Address	Name of Homepage	Details
http://www.tourism.gov.hk/english/welcome/welcome.html	Tourism Commission	Papers, reports and visitor information about Hong Kong tourism are provided in this site.

Changing Climate, Changing Environments

Address	Name of Homepage	Details
http://www.epa.gov/climatechange/	EPA Climate Change	The 'EPA Climate Change' contains a lot of information about climate change issues. It also provides a frequent questions database where users can search for information on climate change.
http://www.panda.org/climate/	WWF - Climate Change Campaign	This website includes information about causes, impact and solutions of global climate change.
http://www.hko.gov.hk/contente.htm	Hong Kong Observatory	Besides weather reports and forecast, there are lots of educational resources in this homepage of Hong Kong Observatory. A detailed explanation about greenhouse effect and climate change can also be found here.
http://assets.panda.org/custom/flash/our_climate_is_changing/	WWF - Our Climate is Changing	Case studies about the impact of global warming in different parts of the world are included.
http://www.weatherbase.com	Weatherbase	This website contains weather data of the world, such as temperature and precipitation, for learning and teaching.
http://www.cma.gov.cn/index.html	China Meteorological Administration	Information about weather and climate of China and other parts of the world can be found.
http://climatechangeissue.com/	Climate Change Issue	Many updated issues about climate change from different journals are collected in this site.
http://www.unep.org/climatechange/	UNEP Climate Change Home	This site is created by United Nations Environmental Programs. It contains publications and news about climate change.

Population Problems—Just about numbers?

Address	Name of Homepage	Details
http://www.cpirc.org.cn/	中國人口資訊網	This is the official website providing information about population in provinces of China. Census and statistics are also provided.

Address	Name of Homepage	Details
http://www.nationalgeographic.com/eye/overpopulation/overpopulationintro.html	National Geographic - Eye in the Sky - Overpopulation	A case studied by National Geographic about overpopulation. Phenomenon and effects are discussed.
http://www.nature.com/climate/2008/ 0806/full/climate.2008.44.html	The population problem: article: Nature Report Climate Change	An article about the relationship between population and the environment.
http://www.overpopulation.com/	Overpopulation.com	The latest news about over-population is contained in this site.

Taming the Sand—A long-lasting combat against desertification and sandstorms

Address	Name of Homepage	Details
http://www.fao.org/desertification/default.asp?lang=en	Food and Agriculture Organization, United Nations - Desertification	The documents in this site may be a bit too technical, but the map and photo galleries are great teaching resources to teachers.
http://oceanworld.tamu.edu/resources/ oceanography-book/desertificationinsahel.html	Desertification in Sahel	This web page provides a good summary of desertification in Sahel. The site also provides other useful geography resources on a number of topics, e.g. climate, plate tectonics, oceans.
http://www.duststorm.com.cn/	中國沙塵暴網 - 中國氣象局	Sandstorm reports and forecast are provided in this official website.
http://www.atmos.pccu.edu.tw/duststorm/index1.htm	沙塵暴資料庫	A database about sandstorm in Taiwan. Knowledge, articles and useful link are provided.
http://www.hkedcity.net/iworld/feature/ view.phtml?iworld_id=101&category= &feature_id=1694	黃沙漫天沙塵暴 - 專題：地理教與學園地	It contains case study about sandstorm and how it affects the air quality in Hong Kong.
http://www.hkedcity.net/article/resources_kit_others/020620-021/page02.phtml	控制擴展中的荒漠	This site is an issue study about desertification. It contains the definition, cases studies and exercises about desertification.

The Geography of Disease—Facing a spreading risk

Address	Name of Homepage	Details
http://www.geography.org.uk/projects/geographyofdisease/	Geographical Association - Geography of Disease	A resourceful website contains useful information and lesson plans on the Geography of Disease.
http://gamapserver.who.int/GlobalAtlas/InteractiveMap/	Global Atlas of Infectious Disease	It contains interactive maps, tables and charts of different infectious diseases.
http://www.sasi.group.shef.ac.uk/ worldmapper/textindex/text_disease.html	WorldMapper - the world you have never seen before	This site collects world maps that are re-sized according to the subject of interest, including prevalence of disease.
http://news.bbc.co.uk/2/hi/in_depth/ world/2009/swine_flu/default.stm	BBC Swine Flu	It is the BBC website with the latest news, articles, and FAQs about swine flu, including an interactive map of the disease.
http://www.flu.org.cn/tcn/	全國流感資訊網	This site provides plenty of information on the spread of influenza in China and the world.
http://www.makingthemodernworld.org.uk/learning_modules/geography/ 05.TU.01/	Making the Modern World - Geography of health & patterns of disease	This site includes some brief case studies of diseases which are good learning and teaching materials.
http://www.spatioepi.com/	Mapping Public Health [公共衛生地圖網]	This site provides maps showing the distribution patterns of various infectious diseases in Hong Kong.

Oceans in Trouble

Address	Name of Homepage	Details
http://www.greenpeace.org/international/campaigns/oceans/overfishing/	Overfishing - Greenpeace International	This site collects the latest news about overfishing.
http://overfishing.org/	Overfishing - A global environmental problem, threat and disaster	This site introduces overfishing and the impact of it. It also contains articles, news and discussion.
http://marinebio.org/Oceans/Conservation/	Marine Conservation	Issues about marine conservation such as marine biodiversity, ocean pollution and sustainable fisheries are contained in this site.
http://see-the-sea.org/topics/environment/Env-container.htm	Ocean Environment	Information about ocean pollution and overfishing are described in this site.

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