Personal, Social and Humanities Education
Key Learning Area

Geography
(Secondary 4-6)

Briefing Notes on
the Updating of the Curriculum

Feb 2017

Introduction

This document contains the proposed updating of five modules of the Secondary 4-6 Geography curriculum. The updating is based on the consultation results of the NAS Medium-term Review held in 2014. The five revised modules include two compulsory modules, namely 'Global Warming' and 'River and Coast', and three elective modules, namely 'Weather and Climate', 'Transport' and 'Zhujiang Delta Region'.

Except for the necessary updating of wording, the other six modules under Section 2.2 and all the other chapters of the Geography Curriculum and Assessment Guide (Secondary 4-6) 2007 (updated as at November 2015) remain unchanged.

Rationale and Summary of Updating

The updating of the curriculum aims at incorporating the latest knowledge, concepts and information into the five modules proposed to be revised. In addition, it is also targeted to provide a smoother learning progression and to facilitate teachers and students to understand better the breadth and depth of the curriculum.

The table below summarises the major updating of the five modules.

The compulsory module on 'global warming'
• The concept 'climate change' is incorporated into the module, with 'global warming' as an illustration of climate change at global scale, while 'urban microclimate' is included as an illustration of climate change at local scale. • The title of this module is rewritten according to the incorporation of the concept 'climate change'. • The module retains its issue-enquiry approach to study climate change as a geographical issue, focusing on the causes, impacts and respective human responses.
The compulsory module on 'river and coast'
• The first guiding question "How does water shape our rivers and coasts?" is cancelled and replaced by a brief introduction of hydrological cycle. • Only the management strategies that can be found in Hong Kong are included. • The UK case study on coastal management is cancelled.
The elective module on 'weather and climate'
• The module retains its systematic approach to study weather and climate. • Part 1 is strengthened and enriched to include the three fundamentally important properties of the atmosphere, namely heat, moisture and motion. • The restriction on the choice of Chinese cities has been removed. Teachers are requested to choose appropriate examples to illustrate North-South and East-West climatic variations in China. • The study of sandstorm has been cancelled.
The elective module on 'transport'
• Part 1 "Logistics — supply chain activities of transportation, warehousing and finished goods inventory management" in and Part 4 "A regional case study — the transport system of the Zhujiang Delta and the role of Hong Kong" have been cancelled. • Basic concepts of transport, e.g. 'linkage', 'network' and 'node', and a new theme "transport development and urban morphology" have been added.
The elective module on 'Zhujiang Delta Region'
• Part 2 on agriculture and Part 3 on industry has been combined. • A new part on urban development and landuse pattern has been added.

2. Managing River and Coastal Environments: A continuing challenge

This module aims at introducing how the work of fresh and sea water creates a variety of fluvial and coastal environments. Through the study of the work of water and the resulting landform features, students should be equipped with the basic understanding of the interaction of various physical factors in shaping the surface of our Earth, and the management issues that arise from increasing human interference in fluvial and coastal environments. Teachers should also aim at ensuring that students have a thorough understanding of the geographical concepts related to erosion, transportation and deposition, such that they can transfer and apply these concepts to the study of landforms in other environments.

Guiding Questions	Explanatory Notes	Concepts	Skills and Suggested Learning Activities
1. Where does water come from and does it go?	• A brief introduction of hydrological cycle: characteristics, stores and transfers	Hydrological cycle	• Draw a diagram of hydrological cycle to highlight the key components, including inputs, outputs, flows and stores.
2. How does water shape the landform in a drainage basin? 3. What are the major landform features created by the work of running water?	• Features of a drainage basin, including watershed, source, mouth, channel network • Major erosional, transportation and depositional processes • Factors influencing the above processes • Major landform features, including gorges, waterfalls and rapids, meanders and associated landform features, flood plains, levees, braids and deltas (using appropriate examples of the Mainland, e.g. Chang Jiang)	Drainage basin Fluvial process and landform	• Delimit the boundary of a river basin on a map. • Annotate photographs to describe the characteristics of the different parts of a river. • Draw cross-sections to illustrate the features of rivers.
4. How does water operate along coasts? 5. What are the major landform features created by the work of wave?	• Wave generation and characteristics (constructive and destructive waves) • Major erosion, transportation and deposition processes, including longshore drift • Factors influencing the above processes • Major landform features, including sea cliff, sea cave, sea arch and stack, wave-cut platform, beach, spit and bar, tombolo	Coastal process and landform	• Identify coastal features shown in maps. • Construct annotated diagrams to illustrate the formation of coastal features. • Use appropriate forms of presentation (e.g. tables, diagrams, statistical charts) to explain how coastal processes of erosion and deposition are influenced by various marine, atmospheric and geological factors.
6. How do human activities influence river and coastal environments and what are the resulting impacts? 7. How does the management of	• Human activities on river and coastal environments: including drainage, reclamation and recreation • Impact and consequences: e.g. flooding, erosion and mass wasting, pollution, and disturbance / damage to the ecosystem	People-environment interaction Conflict Management	• Use GIS, aerial photographs and/or satellite images to analyse the change of fluvial and coastal environments over time owing to human activities. • Conduct a field visit to a river or a coastal area in Hong Kong to observe and identify the various

Guiding Questions	Explanatory Notes	Concepts	Skills and Suggested Learning Activities
river and coastal systems pose a continuing challenge for people?	• "Hard" and "soft" management strategies, including channelization, building breakwaters, land use zoning, and beach nourishment • Management issues, including evaluation of methods and strategies used, and their possible impact		management strategies implemented. • Survey people's views on the management of river / coast in Hong Kong.

Values and attitudes	• Appreciate the beauty of nature • Be aware of the changing nature of our physical environment and its possible impact on human activities • Recognise the need for sustainable management of our physical environment

Time allocation: 24 hours

Case / Specific Examples: River and coastal environment in Hong Kong

7. Climate Change — Long-term fluctuation or irreversible trend?

This module introduces the issue of climate change as a typical example of the interaction between humans and the natural environment. The focus of the issue is on whether climate change, in particular global warming, is just a longer term climatic fluctuation. This module leads students to examine the evidence to investigate whether climate change is an irreversible phenomenon. In addition to studying the causes and impact of climate change at a global scale, this module also has a second focus on local climate change, mainly the modification of urban micro-climate. The investigation of the issue will also ensure that students acquire a basic understanding of the elements and associated patterns of the local and global climate. Moreover, they should be able to understand better how human activities affect our natural environment, and how resulting changes of the natural environment in turn affect us.

Guiding Questions	Explanatory Notes	Concepts	Skills and Suggested Learning Activities
1. What is weather? What is climate? 2. How is our climate like? 3. What evidence is there to prove that our climate is changing?	• Definition of 'weather' and 'climate' • A brief introduction of climate at local, national and global scale. • Evidence showing our climate is changing all over the world: e.g. sharp increase of mean global temperature in recent decades, heat waves and unusually warm weather, sea-level rise and coastal flooding, the melting of glaciers, more frequent extreme weather conditions	Weather and climate Pattern Change over time	• Read and interpret climatic graphs. • Identify climatic characteristics and distribution patterns from climatic maps and graphs. • Collect climatic data on Hong Kong by visiting the Hong Kong Observatory Resource Centre and interpret the trend of Hong Kong's climate change over a long period of time. • Construct thematic maps showing global climatic zones using GIS or other software programs. • Collect evidence from various sources, including the Internet, to illustrate that the global climate is changing.
4. What is global warming? 5. Is global warming a long-term fluctuation of temperature, or is our Earth really heating up? 6. What are the causes of global warming? Is global warming a natural or human-induced climate change at global scale?	• Greenhouse Effect: the mechanism and the role of human activities (e.g. deforestation, burning of fossil fuels, garbage burning, emission of chlorofluorocarbons, agriculture) in enhancing the process • Natural and human causes of global warming • Supporting and opposing arguments for global warming is an irreversible trend	Long-term trend Climate change Interaction between physical and human systems People-environment interrelationship	• Debate the issue "Global warming is a long-term fluctuation of temperature". • Use a concept map or other graphic organisers to display the causes of global warming.

Appendix 1: Updated Compulsory Modules 2 and 7

Guiding Questions	Explanatory Notes	Concepts	Skills and Suggested Learning Activities
7. Is our climate also changing at a local scale? 8. How is the climate of our urban areas different from our rural areas? Why is there such a difference? 9. What are the effects of urban growth and development on the climate of our city?	• Urban growth and development leading to local variations in climate, focusing on heat island effect • Effects of urban growth and development on microclimate, in terms of atmospheric composition, temperature, sunshine, precipitation, humidity and wind	Microclimate Urban climate Heat island effect Spatial variation	• Use data loggers / measuring meters / apps and software programs in the field to collect data of microclimate. • Use GIS or other computer software to plot the data collected from a urban climate fieldwork onto a digital map. • Construct a map to show the spatial variation of microclimate in an urban area. • Construct a scatter diagram to show the correlation between an element of urban climate (e.g. temperature) and the distance from the urban centre.
10. What will be the impact of climate change? How will it affect our lives? 11. What can be done about it? 12. Why is it so difficult to reach a global agreement to deal with climate change?	• Observed climate change in Hong Kong • Consequences of climate change, focusing on winners and losers around the world, e.g. impact on sea level, flood frequency, new farming opportunities, health risks, climatic unpredictability and extreme weather events • Mitigation and adaptation measures at local and global levels • A brief review of the complexities of reaching a global agreement, in particular the conflicting views and roles of key players	Interdependence between human and physical environment International cooperation Individual interest and common good Conservation Sustainable development	• Use GIS or other computer programs to simulate the impact of climate change, e.g. the flooding of coastal regions as a result of the sea-level rising. • Study the potential impact of climate change on one country, including predicting the consequences of global warming and evaluating its plan for prevention and control of the negative impact.

Values and attitudes	• Show concern for the impact of climate change on the global environment • Be aware of the consequences of the interactions between human activities and the natural environment • Recognise the existence of uncertainty in explaining long-term change

Time allocation: 24 hours

Case / Specific Examples: No specific cases are required, but teachers are advised to quote appropriate examples from around the world for studying climate change at a global scale, while for local scale, teachers should consider using Hong Kong and the neighbouring region as examples.

2. Weather and Climate

This elective is for those students with a strong interest in weather and climate. It aims at providing a more academic and systematic foundation for students' further study pursuit in this field.

This elective introduces three fundamentally important properties of the atmosphere, namely heat, moisture and motion. By using Hong Kong and other places in the Mainland as examples, students learn about the basic weather elements and how climate varies with location and time. They also study the interrelationship between climate and human activities, specifically about how climate influences human activities and how human responds to these influences.

Topics	Guiding Questions	Explanatory Notes	Concepts	Skills and Suggested Learning Activities
1. Control factors of the climatic system	• What are the major control factors of the climatic system? • How does the operation of these factors result in global climatic pattern?	• Energy in the atmosphere - Energy budget - Factors affecting insolation - Global temperature distribution pattern • Atmospheric motion - The tri-cellular model - Global pressure pattern - Planetary wind systems • Moisture in the atmosphere - A brief introduction of humidity and condensation - Types of precipitation - Global precipitation distribution pattern • Major global climatic zones	Climatic system Energy budget Atmospheric circulation Humidity and condensation Climatic zone	• Construct annotated diagrams to show how the global circulation system works. • Construct a map using appropriate IT tools (e.g. GIS) to outline the major climatic zones.
2. Climate of China	• How and why does the climate of different places vary? • How and why does the climate of a place varies over time?	• Factors affecting the climate of a location • An introduction of the climate and the major climatic zones of China • North-South and East-West variation of climate in China: causes and characteristics • Seasonal occurrence of weather systems in Hong Kong and the Zhujiang Delta Region: formation and impact - Cold fronts - Typhoons	Climatic factors Location and distribution Pattern Monsoon Spatial variation Weather system	• Collect various type of climatic data of different places from the Internet. • Construct a climatic graph. • Interpret climatic graphs and other climatic data to describe and explain the climatic conditions of a place. • Interpret weather charts to describe and explain the weather of a place. • Identify seasons and weather systems from weather charts. • Construct annotated diagrams to show the

Topics	Guiding Questions	Explanatory Notes	Concepts	Skills and Suggested Learning Activities
				formation and characteristics of weather systems.
3. Relationship between weather hazards and human activities	• What kinds of weather hazards occur in China? • What is the impact of weather hazards on human activities in China? • How do people respond to these hazards in China?	• A brief introduction of the major types of weather hazards (e.g. floods, droughts, sandstorms, typhoons, cold surges and heat waves) and their distribution in China • Causes and impact of drought in North China • Strategies adopted to combat droughts in North China, e.g. water transfer projects, improved farming methods, water conservation projects, proper water management • Evaluation of the effectiveness of these strategies	Weather hazards People-environment interrelationship Environmental management strategy	• Collect information about the major types of weather hazards found in China and summarise their impact on human activities. • Use GIS or other IT tools to construct map overlay to show the relationship between physical factors (e.g. relief, rainfall distribution, temperature distribution) and the occurrence of weather hazards. • Identify the distribution patterns of weather hazards from thematic maps. • Discuss the strategies that can be adopted to combat weather hazards and evaluate their effectiveness.

Values and attitudes	• Appreciate the beauty of nature • Show concern for those affected by weather hazards • Develop a better understanding of China through the enquiry study of weather hazards

Time allocation: 24 hours
Case / Specific Examples: Hong Kong and the Mainland

3. Transport Development, Planning and Management

This elective is for those students with an interest in knowing more about transport geography, and for those who want to broaden their scope of study. It has an academic focus and provides a foundation of knowledge for further studies in related fields. By providing students with a basic understanding of transport planning and management, this elective is also career-related and offers a more direct pathway for those who wish to plan ahead in terms of career development.

This elective aims at providing an introduction to the development of an urban transport system. It covers fundamentals in the geographical analysis of transport, but the main focus is on studying the relationships of transport development, problems, planning and management, as well as their interrelationships with urban spatial forms and development. Local and national examples are used to explain the mechanism and dynamics of transport systems.

Topics	Guiding Questions	Explanatory Notes	Concepts	Skills and Suggested Learning Activities
1. The development of transport and logistics in Hong Kong	• What are the core elements of a transport system and major transport patterns? • What are the major transport modes in Hong Kong? • How have Hong Kong's transport system and logistics developed?	• Transport systems: demand, nodes, linkages, networks, locations, flows, and terminals • Transport patterns (including personal travel and freight transport) • Distance, transport cost, modal choice and modal competition • Unimodal transport and multimodal transport • Major transport modes in Hong Kong (including water transport, rail transport, road transport, air transport, pipelines) • The development of Hong Kong as a transport and logistics hub in the Zhujiang Delta Region	Transport system Node, linkage, network and flow Transport pattern Transport cost Modal choice and competition Location and distribution Change over time and space	• Describe the transport patterns and major transport modes in Hong Kong based on the information and data collected from the websites of the Transport and Housing Bureau and Transport Department. • Plot the routes and networks of two airline companies with Hong Kong International Airport as their hub / origin on world maps for comparison. • Choose an area near your school/home to conduct a traffic flow investigation, which includes counting the number of different types of vehicles passing through designed checkpoints with mobile devices and present and analyse the data collected with suitable cartographic (e.g. flow lines, bar charts and pie charts) and statistical methods (e.g. frequency table, mean, median and mode). • Conduct a survey on modal choice with survey apps. • Visit a logistics company in Hong Kong and / or browse the website of the Hong Kong Logistics Development Council to understand more about the development of logistics in Hong Kong.

Appendix 2: Updated Elective Modules 2, 3 and 4

Topics	Guiding Questions	Explanatory Notes	Concepts	Skills and Suggested Learning Activities
2. Transport problems in Hong Kong	• What are the transport problems in Hong Kong? • Why are there such problems?	• The relationship between transport, energy and environment • Traffic congestion, traffic accidents, car parking and environmental problems (e.g. noise pollution, air pollution, visual impact, effects on ecosystems) • The causes of transport problems in Hong Kong (e.g. lack of planning in the past, high concentration of population and economic activities)	Environment People-environment interrelationship Transport problem	• Collect news articles on Hong Kong's transport problems from various sources and summarise the causes, effects and possible solutions in tabular form / using a concept map.
3. Transport planning and traffic management in Hong Kong	• How does the Hong Kong government cope with the transport problems? To what extent are these measures effective? • What are the transport innovations adopted by the Mainland? To what extent can these innovations be used in Hong Kong to solve its transport problems?	• Improvement of transport infrastructure in Hong Kong (e.g. provision of additional road capacity) • Expansion and improvement of public transport in Hong Kong • Various measures involved in managing road use in Hong Kong • Development of a sustainable transport system in Hong Kong • Effectiveness of the transport planning and traffic management measures in Hong Kong • Transport innovations adopted by the Mainland (e.g. bus-rapid transit (BRT), Maglev train and high speed railway) and the feasibility of implementing them in Hong Kong to solve transport problems	Transport planning Traffic management Sustainable development Transport innovation	• Conduct a fieldwork to investigate the transport planning and traffic management measures of a chosen area in Hong Kong, which includes: - Identify and take photographs of the measures (with GPS locations); - Collect and present other relevant data using mapping apps or software programs; and - Evaluate the effectiveness of the measures identified.

Appendix 2: Updated Elective Modules 2, 3 and 4

Topics	Guiding Questions	Explanatory Notes	Concepts	Skills and Suggested Learning Activities
4. Transport development and urban morphology	• What are the interrelationships between transport development and urban forms? • To what extent the concepts of "transit-oriented development" help to develop a better urban and transport environment in Hong Kong?	• Evolution of transportation (including transport modes, routes and networks) and urban forms, including the space/time relationship of one-hour commuting with different transport modes • Impact of transport on urban land use (e.g. nodes and linkages, land rent theory, distance decay) • "Transit-oriented development" and its impact on the transport and urban development of Hong Kong	Urban morphology Commuting Accessibility Distance decay Urban and transport planning Transit-oriented development (TOC)	• Construct a simple connectivity matrix (or geographic accessibility and potential accessibility) to show the accessibility of different nodes or locations in a region. • Choose a MTR station in Hong Kong to conduct a fieldwork to investigate the impact of "transit-oriented development" on the transport development and internal structure of the area near the chosen station.

Values and attitudes	• Be aware of the importance of transport and logistics development in Hong Kong • Show concern about the problems caused by transport development, and appreciate the effectiveness of various transport planning and traffic management measures / transport innovations in alleviating the problems

Time allocation: 24 hours

Case / Specific examples: Hong Kong and the Mainland

4. Regional Study of Zhujiang (Pearl River) Delta

This elective, which focuses on studying the socio-economic and environmental aspects of the Zhujiang (Pearl River) Delta Region, provides an opportunity for students to apply geographical concepts (e.g. region, change, people-environment interaction) and knowledge (e.g. factors affecting agriculture and industrial location, landuse pattern, urban expansion) developed in the Compulsory Part of this curriculum in an integrative manner. The aims of this study are to study the significant changes and development that occurred in the region in the past decades, and to examine how the natural environment of the region is being affected and how the issue can be managed and resolved.

In developing lesson plans for this elective, teachers should ensure that their designs enable students to achieve the curriculum objective of 'acquiring knowledge and understanding' of the region. Teachers are also reminded that in-depth regional study provides a good opportunity for students to develop and apply both subject and generic skills, as well as to cultivate values and attitudes.

Topics	Guiding Questions	Explanatory Notes	Concepts	Skills and Suggested Learning Activities
1. Zhujiang (Pearl River) Delta as a region	• Where is Zhujiang (Pearl River) Delta? • Why is Zhujiang (Pearl River) Delta regarded as a region?	• Location of Zhujiang (Pearl River) Delta: site and situation • The environmental and socio-economic characteristics of Zhujiang (Pearl River) Delta as a region	Location Region	• Prepare a 10-minute computer presentation to briefly introduce the major environmental and socio-economic characteristics of the Zhujiang (Pearl River) Delta Region.
2. Changing agricultural and industrial development	• What changes can be observed in agriculture and manufacturing industries since the 1980s? • What are the reasons for such changes?	• Changes and development in agriculture and manufacturing industries of Zhujiang (Pearl River) Delta - Agriculture: from subsistence to export-oriented and internal consumption - Manufacturing: from labour-intensive to capital and technology intensive • Reasons for such changes and development	Change over time Development Factors affecting agricultural and industrial development	• Construct maps (GIS as a tool for map making) to show the distribution of various types of agricultural and industrial activities to be found in the region. • Use map overlay to identify the changing agricultural and industrial pattern in the region over a period of time. • Draw a composite bar chart showing the changing pattern of different types of industries developed in the region.

Appendix 2: Updated Elective Modules 2, 3 and 4

Topics	Guiding Questions	Explanatory Notes	Concepts	Skills and Suggested Learning Activities
3. Changing land use pattern	• What changes can be observed in the land use pattern since the 1980s? • What are the reasons for such changes?	• Changing land use pattern since the 1980s: from rural-agricultural dominant to urban-industrial dominant • Urban expansion as a result of economic development and urban growth • A brief introduction of the resulting features of urban expansion: city clusters and villages-in-the-city	Settlement pattern Urban expansion and urban growth Spatial interaction	• Identify the changing land use pattern of Zhujiang (Pearl River) Delta Region from a series of satellite images taken over a period of time. • Conduct a group project to study villages-in-the-city found in Shenzhen or Guangzhou.
4. Change, development and the natural environment	• What are the consequences of the above changes and development on the natural environment? • What have been and should be done to alleviate the problem?	• Environmental pollution in Zhujiang (Pearl River) Delta: causes, types, spatial distribution and variation over time • Impact: e.g. social costs (health, quality of life), economic loss (costs for "clean-up" programmes, moving away of firms and companies), the impact on Hong Kong (air and water pollution) • Management strategies: e,g, legislation, prevention, control, treatment, education (alternative life styles), cross-border cooperation	Environmental degradation Pollution Conservation Environmental management	• Conduct a field trip to one of Hong Kong's inner city industrial districts of Hong Kong (e.g. San Po Kong, Kwun Tong) to study environmental degradation caused by industrial activities.

Values and attitudes	• Be aware of Hong Kong a part of the Zhujiang (Pearl River) Delta Region • Appreciate the inter-connectedness between Hong Kong and its neighbouring areas in the Zhujiang (Pearl River) Delta Region • Show concern for the problems that affect both Hong Kong and other parts of the Zhujiang (Pearl River) Delta Region

Time allocation: 24 hours

Case / Specific examples: Zhujiang (Pearl River) Delta