

**SYLLABUSES
FOR
SECONDARY SCHOOLS**

GEOGRAPHY

(ADVANCED LEVEL)

**PREPARED BY
THE CURRICULUM DEVELOPMENT COUNCIL
RECOMMENDED FOR USE IN SCHOOLS BY
THE EDUCATION DEPARTMENT
HONG KONG
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PREAMBLE

This syllabus is one of a series prepared for use in secondary schools by the Curriculum Development Council, Hong Kong. The Curriculum Development Council, together with its co-ordinating committees and subject committees, is widely representative of the local educational community, membership including heads of schools and practising teachers from government and non-government schools, lecturers from tertiary institutions and colleges of education, officers of the Hong Kong Examinations Authority, as well as those of the Curriculum Development Institute, the Advisory Inspectorate and other divisions of the Education Department. The membership of the Council also includes parents and employers.

All syllabuses prepared by the Curriculum Development Council for the sixth form will lead to appropriate Advanced and/or Advanced Supplementary level examinations provided by the Hong Kong Examinations Authority.

This syllabus is recommended for use in Secondary 6 and 7 by the Education Department. Once the syllabus has been implemented, progress will be monitored by the Advisory Inspectorate and the Curriculum Development Institute of the Education Department. This will enable the Geography Subject Committee (Sixth Form) of the Curriculum Development Council to review the syllabus from time to time in the light of classroom experiences.

All comments and suggestions on the syllabus may be sent to:

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1. INTRODUCTION

Geography makes a valuable contribution to education. This partly arises from the nature of the questions which geographers raise, the variety of possible answers and the knowledge and skills which must be developed to answer questions. The value of geographical study is also derived from the wide variety of learning experiences and materials used.

Geography is itself undergoing changes, and this creates the need for a flexible curriculum and for open-mindedness on the part of both teachers and students. Sixth form students of geography are placed in situations where they have to make reasoned choices, based on a number of value judgements. Creative, critical thinking and problem-solving are therefore emphasized in this curriculum through the study of man-environment systems.

This curriculum is produced to provide guidelines for teachers in formulating a stimulating course for their students. As a continuation of, and link with, the curriculum in Secondary 1-5, the study of man-land relationship is also emphasized.

Landscapes of different nature form the core area of study. These landscapes should not, however, be studied by viewing the physical and cultural elements discretely. Students should be guided to see the relationship between man and the land, and the links that exist between different landscapes.

2. AIMS AND OBJECTIVES

A. General Aims

The aims of the course are to:

- (a) stimulate students' interest in, and enthusiasm for, the study of geography and the world around them,
- (b) equip students with an understanding of man-environment systems in different landscapes,
- (c) develop a range of concepts and skills which can foster the analysis of problems, critical thinking, and the making of sound judgements and decisions,
- (d) help students to develop personal and social values that contribute to the betterment and well-being of mankind.

B. Specific Objectives

Knowledge

Students should acquire knowledge of man-environment systems in natural, agricultural, urban and industrial landscapes, developed through an understanding:

- (a) of distinctive landscapes by using selected examples,
- (b) of the principal components of these man-environment systems,
- (c) of the interaction between man and his environment,
- (d) of the role of man's perception of his environment, and the choices and decisions he makes as a result of this perception, in creating distinctive landscapes,
- (e) that man is a part of a system comprising physical, biological and socio-cultural environments,
- (f) that man's place in the system enables him to alter the inter-relationships: the nature and magnitude of the changes are often a result of man's decisions and activities.

Techniques and Skills

Students should be able to:

- (a) read, understand and interpret a variety of maps, charts and diagrams at different scales,
- (b) identify and interpret the interrelationships of physical and cultural elements of landscapes from ground and aerial photographs and from topographic maps,
- (c) observe, measure and record systematically and accurately data which are relevant to the solution of geographical problems, both in the field and in the classroom,

- (d) draw appropriate illustrations (maps, diagrams, models, landscapes sketches, graphs) and use them to complement and add to written information,
- (e) abstract, interpret and use written materials such as reports, tables, census data, newspaper reports, extracts from relevant journals, magazine articles,
- (f) select and apply elementary statistical techniques (sampling methods; measures of central tendency, deviation and variability; correlation; statistical diagrams),
- (g) construct and test hypotheses in the classroom and the field in order to solve geographical problems,
- (h) present material and arguments in a structured and logical manner and by using appropriate geographical terminology.

Values

Students should:

- (a) be aware of geographical problems found in Hong Kong and in other parts of the world, and committed to the need to maintain and improve the quality of man-environment systems in Hong Kong and elsewhere,
- (b) be aware of the interdependence of communities throughout the world, and the need for international co-operation and good will,
- (c) be aware of the value and the special contribution which geographers make to the solution of man-environment problems.

3. GUIDING PRINCIPLES AND BASIC ORGANIZING CONCEPTS

A. Guiding Principles

The value of geography in general and in the sixth form in particular lies with its emphasis on specialization and its ability to bridge the gap between the humanities and sciences, its emphasis on spatial perspectives and the influence of decisions on the way the world is organized and its focus on data handling. At the sixth form level, the following areas of concern should be emphasized:

(a) *Geographical knowledge at both the global and the local scales*

Knowledge is needed of places, peoples and ways of life and of the concepts which seek to explain spatial differences within man-environment systems. Such knowledge helps students to make sense of current events and make informed judgements about social and environmental issues.

(b) *Environmental awareness*

An awareness of the environment is crucial. It involves the way people use and misuse the environment and the way it can be managed for its healthy and sustainable future.

(c) *Social awareness*

An understanding of cultural differences both within Hong Kong society and elsewhere in the world is essential to appreciate spatial differences and man's responses to problems.

(d) *The development of an enquiring mind*

Geography seeks to arouse and satisfy the young person's curiosity about the world and the desire to make sense of what is seen. It aims to enhance the ability to look at social and environmental issues in a geographical way by asking questions such as:

What can be observed?

Where are the features located?

Why are they there?

What generalizations can be made?

How will they develop?

How ought they change?

In arriving at answers to these questions particular emphasis is required in the enhancement of geographical skills to understand spatial information through maps and other forms of illustration.

To help students to gain a thorough understanding of this geographical curriculum, students' attention should be drawn to the following when interpreting the syllabus content:

- (a) Physical and cultural elements of a landscape may be organized or grouped into natural and cultural units and regions.
- (b) Units and regions may possess closely similar or highly dissimilar characteristics, and changes in character from one unit or region to another may be abrupt or gradual.
- (c) Modifications of spatial characteristics are continually occurring.
- (d) Contrasting interactions of processes may be revealed at given points in time.

B. Basic Organizing Concepts

Landscapes, systems and man-environment systems are the three organizing concepts on which this curriculum is based. The integration of these three concepts forms the foundation of the curriculum. Students need to develop the ability to use relevant facts to show comprehension, application, analysis and synthesis of these organizing concepts. In order to help students to grasp the meaning of these concepts in the context of this curriculum, these three concepts are explained as follows:

(a) *Landscapes*

This refers to an area comprising a distinct association of forms, both natural and cultural. Landscape elements include physical and biological features (landforms, vegetation, etc.) and cultural features (houses, roads, crops, etc.). They are woven into a system by processes resulting from the activities of people and nature, or from the interplay of the two.

The study of landscape in geography highlights the integrated characteristics of the discipline and is a useful means to look at man-land relationship with reference to specific areas/regions. Emphasis has to be put on studying the complex interactions and feedback that exist between man and socio-economic elements on one end, and resources and the natural environment on the other.

(b) *Systems*

A system is an interacting set of components where a change in one component will lead to changes throughout. The effect of change in time and space needs to be emphasized. A system can be divided into levels of sub-systems to meet particular purposes. This allows effective study of processes and forms, and relationships at different scales and depth. For example, ecosystem is a particular type of system. It can be viewed as a functioning interacting system of living organisms and their effective environment. The idea of ecosystem is of value both as a specific concept in biogeography and as organizing ideas in many man-environment situations.

(c) *Man-environment systems*

This expresses the way in which people interact with their cultural and physical surroundings. It expresses the way in which people are able to organize the environment for their own use with resultant landscape changes on the one hand, and be restricted by environmental constraints on the other.

A man-environment system is a complex system made up of two large sub-systems—the physical environmental sub-system and human activities sub-system. Changes in the cycling of materials, and exchanges of energy and information, etc., form the basis of study. The study of man-land relationship helps students to identify the causes of problems, understand the relationship between elements and the interaction between people and land, and explore possibilities of achieving the better use of resources and maintaining the sustainability of the system.

4. SYLLABUS CONTENT AND CURRICULUM GUIDE

A. Landscape Interpretation

Landscapes with varying degrees of human impact are used as the basis for system study:

- I. Natural Landscapes
- II. Agricultural Landscapes
- III. Urban and Industrial Landscapes

Each landscape should be studied with reference to the components, forms and processes which make it distinctive from, or similar to, other landscapes. Students are expected to demonstrate the ability to analyse landscape information. They should be able to:

- (a) extract information from varying sources of data,
- (b) identify the main components and linkages within the system, and
- (c) draw explanatory inferences, in the context of the geographical concepts they have learnt.

With respect to the content areas, students should be able to recognize:

- (a) the nature of the environmental processes and responses,
- (b) people's ability to perceive the environment and how it influences their decision-making in exploitation,
- (c) the effects of this exploitation on the spatial distribution of people's activities and the effects of the distribution of people's activities on the ecosystem as a whole,
- (d) the effects of economic, political, social and cultural systems.

Students should be able to identify solutions to geographical problems. They should also be able to assess the effectiveness of these solutions.

The key issues of concern include:

- (a) What factors, and in what order of significance, contribute to the distinctiveness of particular landscapes?
- (b) To what extent do these factors reveal similarities and differences between places?
- (c) Can broadly similar areas be identified and classified into landscape regions?

These issues can be resolved into the following questions:

- (a) What features are visible on the earth's surface?
- (b) Where on the earth's surface are these features located?
- (c) Why, or by what chain of events, are they there?
- (d) How are the features related spatially and functionally?

B. Case Studies

Case studies help extend learning beyond the theoretical context. They help students to relate concepts to reality within each of the landscapes, and test the applicability of theories and models.

Case studies are a useful means of bringing reality to students' understanding. It may sometimes be possible to use case studies which embrace a number of key ideas. This will enable synthesis of knowledge. In some situations, the use of more limited specific examples which serve to illustrate a number of concepts may also be appropriate. However, an ability merely to quote named examples is insufficient to meet the requirement of this curriculum. The case studies chosen should be consistent with the general themes and suggested interpretation of landscapes outlined in the content areas. They should also conform to the objectives stated in unit two of this curriculum.

Depending on the time available, one or more case studies or detailed examples should be used within each of the natural, agricultural, urban and industrial landscapes. However, there is no definite rule regarding the nature and number of case studies.

The selection of case studies will depend on their relevancy to the study of a particular topic. Some case studies are better developed at a micro scale whereas for others, a macro scale may be applicable. It is highly desirable to allow comparisons within Asia and outside Asia. However, this curriculum is not intended to provide a comprehensive regional/continental coverage.

C. Content Areas

I. Natural Landscapes

1. Climatic System

- (a) the energy budget, energy flow, spatial variation
- (b) atmospheric moisture, processes, flows within the system
- (c) atmospheric circulation, air masses, major wind systems
- (d) the interplay of (a), (b) and (c) which result in climatic variation

2. Landform System

- (a) plate tectonics and the distribution of major landform features
- (b) the drainage basin system and its variation in different environments (tropical humid, tropical arid, polar)
 - i. the hydrological cycle in the context of landform development
 - ii. the weathering sub-system
 - iii. the slope sub-system
 - iv. the channel sub-system

3. Biotic System
 - (a) ecosystem
 - (b) major factors and processes influencing the nature of soil (podzolization, laterization, calcification, salinization, gleying)
 - (c) factors influencing the development of vegetation
 - (d) plant-environment relationships at a global scale (biomes) and at a local scale
4. An understanding of man-environment relationships within the following environments:
 - tropical rain forest
 - tropical desert

II. Agricultural Landscapes

1. farming as (a) an ecological system, (b) an economic system:
 - i. physical, social and economic components, interactions, flows
 - ii. effects on crops and/or livestock selection and production
2. spatial patterns in agricultural landscapes: land-rent and distance decay concepts, concepts of agricultural location (von Thunen, Sinclair)
3. impact of urbanization and industrialization on farming
4. farming hazards (floods, droughts): nature, magnitude and frequency, effects and solutions

III. Urban and Industrial Landscapes

1. location, spacing, size and functions of urban settlements (Christaller, Zipf)
2. spatial patterns in urban landscapes
 - (a) land-rent and distance-decay concepts, concepts of urban structure (Burgess, Hoyt, Harris and Ullman)
 - (b) urban population densities
3. concepts of manufacturing location (Weber, Smith): role of raw materials, energy, labour, transport, market, technology, behavioural and institutional factors; agglomeration and decentralization
4. urban problems: housing, transport
5. the impact of urbanization and industrialization on the quality of the environment

D. Curriculum Guide

The curriculum guide intends to help teachers to interpret the syllabus and to plan the teaching syllabus. For easy reference, it adopts a table format in presentation. There are four columns: theme, content, explanatory notes and suggested time allocation. Topics related to various themes are identified in the content and the explanatory notes highlight the following where appropriate:

- identification of key concepts and man-environment elements related to a theme,
- suggestions about the depth and scale of treatment for a theme,
- relating theoretical models to real world situation,
- incorporation of fieldwork into teaching a theme,
- identification of relationships and links between themes,
- use of specific examples.

The ways of tackling the content outlined in the explanatory notes are by no means exhaustive. Like the suggested time allocation, they serve as a reference for teachers when planning their own teaching syllabus. Teachers should use case studies or detailed examples to link topics and themes across the curriculum. Statistical methods and fieldwork should be used where relevant.

NATURAL LANDSCAPES

Theme	Content	Explanatory Notes	Suggested Time Allocation
1. CLIMATIC SYSTEM			
(a) The energy budget, energy flow, spatial variation	<ul style="list-style-type: none"> a. Balance between incoming and outgoing radiation in the earth-atmospheric system b. Processes of vertical and horizontal energy flow in the earth-atmospheric system c. Spatial variation of energy budget 	Transfer of heat energy in the earth-atmospheric system is the basic cause of the functioning of all other atmospheric processes and phenomena. Students are expected to understand the concepts of heat transfer and energy budget, and the related processes; account for the global picture and the spatial variations of energy budget and relate them to phenomena listed in themes 1 (b) and 1 (c). Students should be aware of the effects of man's activities on global heat balance (e.g. increased carbon dioxide in the atmosphere and global warming).	12 periods
(b) Atmospheric moisture, processes, flows within the system	<ul style="list-style-type: none"> a. Types of condensation and precipitation b. Formation processes of condensation and precipitation c. Atmospheric stability and condensation d. Distribution pattern of precipitation in the world 	Atmospheric stability is one major factor affecting weather conditions and it is related to heat transfer and moisture processes in air. Students are expected to relate the concept of atmospheric stability to the explanation of condensation and precipitation processes, and account for the spatial variation in the amount, intensity, duration and frequency of precipitation by using specific examples. The ways how extreme conditions such as flood, drought affect people's activities should be noted to provide study beyond just looking at the physical processes.	14 periods
(c) Atmospheric circulation, air masses, major wind systems	<ul style="list-style-type: none"> a. Atmospheric circulation: horizontal and vertical flow, driving forces, and influences on surface wind system 	Atmospheric circulation is the mechanism through which the energy surpluses and deficits are balanced, and the balance involves air movement of different scales. Students are expected to understand the flows and driving forces of atmospheric circulation, relate atmospheric circulation to surface wind systems,	16 periods

Theme	Content	Explanatory Notes	Suggested Time Allocation
(d) The interplay of (a), (b) & (c) which results in climatic variation	b. Air masses: nature and types, influences on weather and climate c. Major wind systems: patterns and characteristics of the trades, westerlies, polar winds and monsoon	<p>understand the nature and characteristics of air masses and note how people respond to atmospheric disturbances.</p> <p>The interplay of themes 1 (a)–(c) results in climatic variation of places/regions in the world. Such interplay is best studied by using an integrated approach on a global scale. Students are expected to illustrate the variation by using examples selected from tropical humid, tropical arid and polar regions, and explain how climatic conditions of some places favour but some pose constraints on human activities. Detailed study of climatic classification systems is not necessary.</p>	10 periods
2. LANDFORM SYSTEM (a) Plate tectonics and the distribution of major landform features	a. Plate tectonics: concept and supporting evidence b. Relationship between plate movement and the following phenomena: i. earthquake, ii. vulcanicity, and iii. mountain building c. Spatial distribution of the plates and major landform features (volcanoes, ocean trenches, fold mountains, mid-oceanic ridges and rift valleys)	<p>Many major landform features are the result of plate tectonics. Students are expected to use evidence of major landform features and catastrophic phenomena (earthquake, volcanic eruption) to illustrate the concept, and examine the relationship between plate tectonics and human activities. Detailed study on the types of fold, fault and volcano is not necessary. The study of people's responses to earthquake and volcanic eruption provides a good understanding of the man-land relationship related to plate tectonics.</p>	14 periods

Theme	Content	Explanatory Notes	Suggested Time Allocation
(b) The drainage basin system and its variation in different environments (tropical humid, tropical arid, polar)	a. Drainage basin system: components and their interactions, and sub-systems b. Drainage network: drainage patterns, stream orders, stream density, bifurcation ratio	Drainage basin is a discrete landform unit and it has many practical advantages over other major landform units in understanding the processes at work on land. Students are expected to identify the significance of drainage basin as a system, depict the components of and processes at work in a drainage basin by using systems models/diagrams and illustrate the variation in characteristics of drainage basins in different environments. Students should also be aware of the conflict of interest that may exist within a drainage basin (e.g. upstream lumbering may change the characteristics of stream discharge, increase flood magnitude and thus affects downstream farming). The ways people modify the basin system provide a useful starting point for study.	8 periods
i. the hydrological cycle in the context of landform development	Operation of the hydrological cycle with emphasis on processes related to landform development	Students are expected to point out the relative importance of various components of the hydrological cycle on landform development in different environments.	4 periods
ii. the weathering sub-system	a. Weathering as a sub-system within the drainage basin system b. Controlling factors of weathering c. Types and processes of weathering	Weathering prepares the way for further denudation. Students are expected to assess the relative importance of various weathering processes on drainage basin/landform development in different environments.	8 periods
iii. the slope sub-system	a. Slope as a sub-system within the drainage system b. Slope gradient and form (convex, concave, rectilinear and complex)	Weathering, mass movement and erosion are the major processes in shaping slopes. Students are expected to examine the relationship between slope processes and slope form/gradient, and people's choice of activities in response to slope factors. Detailed study on factual account of	10 periods

Theme	Content	Explanatory Notes	Suggested Time Allocation
iv. the channel sub-system	<p>c. Slope processes: weathering, mass movement and erosion</p> <p>a. Channel as a sub-system within the drainage basin system</p> <p>b. Channel form: plan, long profile and cross profile</p> <p>c. Channel processes: erosion, transportation and deposition</p> <p>d. Channel flow, hydrograph and its relation to drainage basin characteristics</p> <p>Interpretation of themes 2(b)i.–2(b)iv. should be referred to the following environments: tropical humid, tropical arid and polar. Due emphasis should be laid on the interactions among different sub-systems to illustrate the similarities and variations in different environments. Students are expected to note that the input, output and feedback mechanism of weathering, slope and channel processes are interrelated. Students are also expected to examine how a change of physical/human input, whether in the form of energy or material, may affect the form, process and thus the equilibrium in a drainage basin. The relationship between weathering, slope and channel processes and people's activities in drainage basins of different size should also be emphasized and local fieldwork should be used whenever appropriate.</p>	<p>individual mass movement and erosion forms is not necessary.</p> <p>Students are expected to identify the role of channel as a sub-system of the basin system, examine the relationship between channel form and channel processes, and account for how hydrograph of rivers of different environments is related to climatic influences and properties of drainage basin. Besides, how people have modified channel flow and form so as to facilitate their activities within the drainage basin should be noted.</p>	14 periods
3. BIOTIC SYSTEM (a) Ecosystem	<p>a. Components of an ecosystem</p> <p>b. Interactions among components: energy flow and nutrient cycling</p>	<p>Ecosystem is a particular type of system. It can be viewed as a functioning interacting system of living organisms and their effective environment. Students are expected to grasp a general understanding of the components and their interactions as this forms the basis in analysing</p>	8 periods

Theme	Content	Explanatory Notes	Suggested Time Allocation
(b) Major factors and processes influencing the nature of soils (podzolization, laterization, calcification, salinization, gleying)	<p>c. Factors affecting the stability of an ecosystem</p> <p>a. Physical and chemical properties of soil</p> <p>b. Soil profile and its development processes</p> <p>c. Factors of soil formation: climate, parent materials, topography, organisms, time</p> <p>d. Soil formation processes in different environments (podzolization, laterization, calcification, salinization, gleying) and their associated soil types</p>	<p>the stability and functioning of ecosystem at various scales. People as an integral part of and how they affect the stability of an ecosystem should be noted. Local fieldwork would be a valuable means to experience the interrelationship among the components.</p> <p>Soil is a dynamic body and a vital component of ecosystems. Students are expected to analyse the interrelationship of soil formation factors and processes, and the resultant characteristics of soil profile in different environments. Students should be aware that people's activities may have significant impact on soil profile and soil forming processes.</p>	14 periods
(c) Factors influencing the development of vegetation	<p>a. Influence of climate, soil, topography and organisms on the development of vegetation</p> <p>b. Succession</p>	<p>Vegetation is another vital dynamic component of ecosystems as changes are always occurring. Students are expected to account for the distribution and growth of vegetation. Vegetation changes, the succession process and the role of people should also be emphasized.</p>	8 periods
(d) Plant-environment relationships at a global scale (biomes) and at a local scale	<p>a. Types, distribution and characteristics of major biomes: forest, woodland, grassland and desert</p>	<p>Major biomes (type, distribution and characteristics) are best studied in an ecosystem context through which the interaction of biotic and abiotic elements can be emphasized and the adaptation (plant-environment responses)</p>	10 periods

Theme	Content	Explanatory Notes	Suggested Time Allocation
	<ul style="list-style-type: none"> b. Controlling factors of the distribution of major biomes c. Environmental gradient: the change from tropical rain forest to desert d. Plant-environment relationships at a local scale <p>Knowledge and concepts acquired in themes 3(a)–(c) should be integrated and applied to the understanding of the plant-soil-environment relationships and characteristics of selected biomes at a global scale.</p>	<p>examined. Factors of distribution and variables affecting gradient changes should be exemplified by using specific examples. Fieldwork in local scale enhances the understanding of plant-environment relationships.</p>	
<p>4. MAN-LAND RELATIONSHIP IN SELECTED NATURAL LANDSCAPES</p> <p>An understanding of man-land relationship within the following environments: tropical rain forest, tropical desert</p>	<ul style="list-style-type: none"> a. Environmental characteristics and major human activities b. Possibilities and constraints presented by the environment on human activities c. Impact of human activities on the environment 	<p>People's choice of activities in the environments is influenced by the opportunities provided by climate and resources available on land. Students should understand the environmental characteristics, relate them to explain people's activities, and assess their role in modifying the landscape. The extent of people's ways in affecting the functioning of ecosystem and economy of the area concerned should be noted. The understanding of man-land relationship should be enhanced by referring to specific examples found either in tropical rain forest or tropical desert. Impacts of man (e.g. desertification, land reclamation, etc.), however, may cross regions/landscapes, improve or degrade the quality of the environments, and vary with places and change with time. Various</p>	<p>26 periods</p>

Theme	Content	Explanatory Notes	Suggested Time Allocation
		measures have been taken to cope with environmental constraints and problems induced because of people's activities. Students are also expected to assess people's effort and success in maintaining a harmonious man-land relationship. Detailed study of factual account of human activities is not necessary.	

AGRICULTURAL LANDSCAPES

Theme	Content	Explanatory Notes	Suggested Time Allocation
1. Farming as (a) an ecological system, (b) an economic system i. physical, social, economic components, interactions, flows ii. effects on crops and/or livestock selection and production	a. Farming as ecological and economic system b. Components (physical, social, economic), interactions and flows (energy, nutrients, money, information) of farming system c. Effects of components, interaction and flows of farming system on crops and/or livestock selection and production	The operation of farming system is a result of the interaction of ecological and socio-economic factors. Students are expected to analyse such interaction at different locations and at different scales. Studies on the relative merits and demerits of various farming systems are expected as they are conducive to an understanding of the notable man-land responses that take place in different parts of the world. Students should understand how and why farmland has been wisely used or misused and note the problems and solutions that have arisen.	28 periods
2. Spatial patterns in agricultural landscapes: land rent and distance decay concepts, concepts of agricultural location (von Thunen, Sinclair)	a. Land rent and distance decay: concepts, and their effects on agricultural land use patterns b. Agricultural locational models: von Thunen, Sinclair i. the concepts, ii. application in real world situation, iii. criticisms	The locational pattern of agricultural activities is closely related to the concept of land rent. Students are expected to assess the importance of the land rent and distance decay concepts on the spatial pattern of farming activities through using specific examples. The spatial pattern of agricultural activities should better be first identified and then compared with the situations as generalized in the locational models.	16 periods

Theme	Content	Explanatory Notes	Suggested Time Allocation
3. Impact of urbanization and industrialization on farming	Impact on: i. farm production, ii. rural land use, iii. rural population	Farming system is not an isolated system. Students are expected to explore the spatial association and interaction of agricultural and urban-industrial landscapes. Changes in farming characteristics (production, land use and population) are continually occurring and they are best revealed through empirical studies in the real world prior to making any generalizations. Students should be aware of conflicts of interest that may occur over the changing use of the land. Fieldwork enhances the understanding of the conflicts.	12 periods
4. Farming hazards (floods, droughts): nature, magnitude and frequency, effects and solutions	Farming hazards: floods, droughts i. nature, magnitude, frequency and causes, ii. effects on farming, iii. measures and their effectiveness in combating the hazards	Hazard studies bring students' awareness of the opportunities and constraints in farms. Students are expected to develop concepts of conservation and to note the importance of balance over the use of resources by using relevant evidence. They have to make reasoned account on the extent of the problems and to evaluate the various ways and measures in combating hazards.	14 periods

URBAN AND INDUSTRIAL LANDSCAPES

Theme	Content	Explanatory Notes	Suggested Time Allocation
1. Location, spacing, size and functions of urban settlements (Christaller, Zipf)	<p>Concepts of location, spacing, size and functions of urban settlements by Christaller and Zipf</p> <ol style="list-style-type: none"> the ideas, application in real world situation, criticisms 	Settlements are not randomly located. They vary in size and space. Functional role (types of goods/services provided) and population size of urban centres show relevance to the understanding of settlement patterns. Specific examples should be observed and their patterns be further related to the pictures as generalized by Christaller and Zipf.	22 periods
2. Spatial patterns in urban landscapes (a) land rent and distance decay concepts, concepts of urban structure (Burgess, Hoyt, Harris & Ullman)	<ol style="list-style-type: none"> Land rent and distance decay: concepts and their effects on spatial pattern of urban land use Models of urban structure: Burgess, Hoyt, Harris & Ullman <ol style="list-style-type: none"> the concepts, application in real world situation, criticisms 	As cities have grown in size, activities become more orderly developed over space. Accessibility and land values are generally accepted to have some gradient effects on shaping land use pattern. Students have to weigh up the available evidence of real world situations in concluding the effects of land rent and distance decay on urban land use. Besides, students are expected to identify and give reasoned account on the spatial patterns of urban activities. Again studies of real world situations are expected and preferably made prior to the understanding of the concepts as generalized by the models of urban structure. Local fieldwork enhances the understanding of the related concepts.	21 periods

Theme	Content	Explanatory Notes	Suggested Time Allocation
(b) Urban population densities	Population density distribution in cities: patterns, factors, and changes through time	Population density and its spatial change over time are to be exemplified through real world illustrations. The interplay of socio-economic and environmental factors should be emphasized. Man-land relationships in areas of different population densities need to be identified, and the impacts of changing population density should also be noted.	8 periods
3. Concepts of manufacturing location (Weber, Smith): role of raw materials, energy, labour, transport, market, technology, behavioural and institutional factors; agglomeration and decentralization	a. Role of raw materials, energy, labour, transport, market, technology, behavioural and institutional factors and the influence of agglomeration and decentralization on the locational pattern of industries b. Manufacturing locational models: Weber, Smith <ol style="list-style-type: none"> the concepts, application in real world situations, criticisms 	The locational pattern of industrial activities is closely related to the concept of profit maximization. Students are expected to assess the relative importance of various locational factors on particular industrial activities by referring to specific examples. Students are expected to use the idea put forward by Weber and Smith to explain the real world situation of manufacturing and to analyse the limitations of these models.	33 periods
4. Urban problems: housing, transport	Housing and transport problems: <ol style="list-style-type: none"> causes, impacts, solutions 	Students are expected not just to grasp the factual description on problems, but to build up critical judgements on the impacts of problems and to assess the effectiveness of alternative measures in easing the problems of housing and transport.	14 periods

Theme	Content	Explanatory Notes	Suggested Time Allocation
5. The impact of urbanization and industrialization on the quality of the environment	Location, types and intensity of the impact on the physical and built environment	Environmental qualities are highly fragile. Students are expected to illustrate how the physical (air, land and water) as well as the built environments (including the socio-economic aspects) are being affected by the processes of urbanization and industrialization. Specific examples are required to show what the positive and negative impacts refer to, how people see the impacts and what possible solutions have been and should be done to reduce the negative impacts. Students should also be able to analyse the social and environmental costs of a particular environmental issue, e.g. the impact of industrial concentration, the siting of a new airport. Local fieldwork enhances the understanding of the impact of urbanization and industrialization.	16 periods

5. GUIDELINES ON TEACHING

A. Suggested Time Allocation

The curriculum has been compiled on the assumption that schools can provide a minimum of 8 periods per week, preferably with double periods, for the teaching of geography in Secondary 6 & 7. A total of 360 teaching periods will be required over the two years to complete the curriculum. An estimate of the number of periods for each landscape is shown below:

<i>Landscape</i>	<i>Number of Periods</i>
A. Natural Landscapes	176
B. Agricultural Landscapes	70
C. Urban and Industrial Landscapes	114
Total:	360

A suggested time allocation for individual topics is given in the curriculum guide.

B. Teaching Strategies and Learning Activities

i. *Teaching Geography in the Sixth Form*

It is not just the content, the kind of teaching strategies or learning activities that distinguish studying geography in the sixth form from Secondary 4 & 5. It is the ways that the strategies are used to organize learning activities and the learning outcomes that count. In the sixth form, students should be allowed more opportunities to think, to work, and to value things independently. They should learn to give reasoned accounts, to show understanding of concepts, to explain relationships and to make logical evaluation and assessment in tackling problems and issues. Issue enquiry should be emphasized.

Learning should be student-centred and characterized by active participation, and by lively communication both among students, and between students and the teacher. Students should be encouraged to work both independently and in group in gathering information, and apply skills in problem solving.

The study of geography in the sixth form is distinguished from that of other levels in the following ways:

(a) *Rigour*

Sixth form studies are distinctive by the level of systematic analysis students become involved in. This in turn requires students to value precision, realize the need for a critical interpretation of data, and to

evaluate association and cause-effect links. Students also need to be self critical in their approach to study. In achieving these aims a degree of sophistication in communication is necessary.

(b) Application

Sixth form studies demand the ability to use geographical understanding to evaluate the consequences of spatial decisions. Emphasis on "why/how" and "how will/how ought" will dominate and become means to answer higher level questions.

(c) Depth

Sixth form studies are distinctive by their conceptual level of study. However, such study should involve more than just theory. Students need to use abstractions to make sense of the world. This is in contrast with fifth form studies where observable relationships constitute the main target.

(d) Breadth

Sixth form studies typically are multi-dimensional at a variety of scales. They involve linkages between subjects and the ability to see a problem from a number of directions (political, social, economic, environmental, etc.).

(e) Independence

Sixth form studies demand the ability on the part of students for them to play a greater part in the management of and responsibility for their own work.

ii. Selected Teaching Strategies and Learning Activities

Teachers, and the expertise they offer, are fundamental to the success of class teaching. Teachers must keep in mind the aims and objectives of the syllabus, the intellectual and emotional development of the students and the appropriate balance between the acquisition of knowledge, development of skills and formation of attitudes for any teaching strategy or learning activity.

To help teachers to plan their lessons, this section highlights certain strategies and activities which are more appropriate at the sixth form level. These strategies and activities serve to promote thinking and interflow of ideas among students themselves as well as between students and the teacher. To be in line with the requirement of this curriculum, enquiry and research as well as reflective thinking should also be emphasized.

It is important to employ different teaching strategies and organize a variety of learning activities. The appropriateness of a particular teaching strategy depends on a number of factors, such as the nature of the topic, availability of resources, abilities and the needs of students.

There is no stereotyped set of methods for a topic. For example, a short talk can sometimes be quite effective if carefully planned. But when it becomes the predominant or sole teaching method, there is the danger of fostering passive rote-learning. Whatever learning activity is arranged, group work should be emphasized to give students opportunities to communicate and co-operate.

The provision of information is necessary as concepts cannot be developed in a vacuum. However, providing excessive information for the sake of comprehensive coverage is undesirable. It is important that just sufficient information is provided to answer questions which are set at the level required. Able students can make reference to other sources of information if they wish to go further. Care also needs to be taken in the sort of materials provided and its suitability in meeting the objectives.

The following points should also be noted:

- simplify wording of written materials if necessary and remove sections of text irrelevant to the topic in order to save reading time,
- give clear instructions and explanations on how to use the information,
- give complex information from different sources only when students have become used to handle information.

Suggestions on strategies which can be used in the sixth form are discussed below. The value of each strategy in achieving particular objectives or skills is specified. It is also worth noting that a composite approach embracing one or more strategies/activities should frequently be contemplated when structuring a course for sixth form students. For greater benefit to teachers, topics suited to a particular strategy are identified where applicable. For others, the way the strategy can be used is illustrated with specific topical examples. The strategies are not, however, intended to be exhaustive, nor are they arranged in any order of priority. Whichever strategy is used, it has to meet one or more of the following requirements. It should:

- be student-centred,
- diagnose students' abilities,
- train various basic modes of communication: mapping, reading, speaking, writing, applying statistics and graphics
- stress critical thinking and enquiring mind,
- emphasize problem solving,
- highlight the importance of values in resolving geographical problems,
- provide data-based activities.

(1) Group Discussion

Group discussion allows interaction between groups and students/teacher. Students are encouraged to express personal opinion and can gain confidence in handling ideas. Various skills including competence in oral delivery as well as ability in comprehending opinions, formulating hypotheses and organizing information in a logical and coherent form are enhanced.

Group discussion may be led by the teacher or preferably run as a student activity. It can be initiated by a speaker, a film, slides or a tape. The use of relevant source material helps stimulate imagination, enliven and direct the discussion.

Group discussion is especially suitable when dealing with controversial issues, for which there are no clear cut answers. It can also be used as follow-up activity to other learning activities. Through this activity, students are given the opportunities to stimulate each others' thinking and to generate a wide array of alternative responses to questions that cannot be answered exactly.

The teacher should play the role of a facilitator to help students to clarify ideas, formulate tentative conclusions, consolidate ideas, sort out doubts and misconceptions at the end of a session. The important part of the teacher is to create with students a set of guiding questions to direct the discussion.

IMPORTANT POINTS TO NOTE:

- (a) Usual classroom seating arrangement may not be ideal for this activity. Sitting around in a circle in the geography room, for instance, is a good alternative.
- (b) The leader in each group should ensure each classmate participates and the discussion not to be dominated by a few members.
- (c) In the initial session, teachers may encourage participation by helping students to set up key questions.

Example

Topic: **FARMING AS AN ECONOMIC SYSTEM**—The components that affect and the effects which relate to crop/livestock production (note: different sources of information can be used to achieve different objectives).

Situation 1

Students are provided with figures of farmers' low income and high price of imported food and if possible incidence of farmers' riots and simplified picture of personal tax of a named country in the developed world. A controversial issue *"the government should stop subsidizing*

home production of food" is raised to students for discussion. The discussion may emphasize on finding out whether there is such a need in the market of free competition and students are alert to find out the role of various factors and see if there is influence of new factors. Students are then asked to draw conclusion and make recommendations for the government to resolve the problem.

Situation 2

Students are provided with the information of the variables (such as climate, relief, market demand, etc.) affecting the crops grown and/or livestock kept in a number of farms. The information should also show the patterns of contrasting cost and revenue of varying farm size (such as data for comparison of farms in the early 70s and the late 80s of South China, or data for a comparative study of a large sheep farm in Australia and a small market garden in the Netherlands). The problem "*small farms are often more efficient to run than large one*" is then raised for discussion. Students are asked to find out the relative importance of factors which affect the choice of crop/livestock, and then to suggest and justify the future trend of farm size for the countries/areas under study in a reporting back session.

(2) Role Play/Simulation Game

These are highly-motivating methods for building thinking and decision-making processes. They are often used to illustrate principles, to involve students actively and to motivate interest through participation.

Simulation games can take the form of ordinary game boards or action games of usually a non-verbal character. Role plays involving problem-solving and decision-making enable students to explore feelings of others in a similar setting. In a post-activity discussion, students' experience in the game or role play can be compared with their perceptions of reality.

Computerized simulations and simulation games currently available on the market can also be employed to promote geography simulation in the classroom.

Teachers should take a non-directive role and should behave like a consultant or a referee. However during the post-activity discussion, the teacher might become a more central figure.

IMPORTANT POINTS TO NOTE:

- (a) Assign each student with a role to ensure that no one is going to "opt out" of work.

- (b) Computer-assisted simulation may be employed for the tedious simulation activity which requires sophisticated mathematical knowledge and skills.
- (c) Students can easily be motivated, but the benefits they get from the learning activity may be limited because of their ability. A framework on what to note during the activity may help.

Example

Topic: DISTANCE DECAY AND LAND USE

Situation 1

With reference to a centrally located market and data on crop prices and transport rates, students calculate the economic rent of different crops/land uses and find out the extent of each land use zone. Students should then explain (i) the location of each land use and (ii) the change in land use with distance from the centre so as to build up concepts of distance decay and land rent.

Situation 2

Situation 1 may be further extended by asking students to observe and sort out the most feasible change of land use with the simulation of different conditions. For example, the first group of students might be given the figures concerning the import of food and changes in farming area to simulate the considerations of farmers. A second group of students might be asked to simulate the viewpoints of environmentalists and the third group to simulate the project consultant for a golf course in the area. Each group should argue for their view about the land use and find the way to resolve conflicts of interest over the use of land.

(3) Debate

This activity facilitates examination of controversial issues and its success relies much on adequate research work of the students before the activity is conducted. A successful logic for debate provokes critical thinking, helps students to organize and present ideas in a clear and logical form in order to make convincing judgements supported with sound arguments, and practise the skills of speaking in public and working in a group.

Debate is probably more appropriate in aspects of human geography as points of view are often more controversial as they often involve value judgement of various interest groups. Thus, topics on agricultural landscapes, and urban and industrial landscapes are more suitable for the organization of the activity. During preparation, students can acquire supplementary and tangible information or points of view

through the mass media, e.g. TV and radio broadcasting, newspaper and magazines, etc., for updated data/information for participating in the activity.

Besides acquiring better understanding of the issues/topics concerned, the activity also helps students to appreciate the need to balance the interest of different groups or classes in society. This is especially meaningful in a more and more diverging society where groups are more aware of their own rights and interest.

IMPORTANT POINTS TO NOTE:

- (a) Adequate time must be given to allow students to prepare for the debate.
- (b) The teacher must check with students who will act as speakers to make sure they understand the procedure of conducting the activity and how to play the role assigned. Taped forum and debate may be used to help explain how the activity is conducted.
- (c) It is important to let students understand that the activity is not to find a winner but to explore different viewpoints and conflict of interests. Students have to pay due respect to whatever opinion and argument raised.

Example

Topic: URBAN PROBLEMS—TRANSPORT

Situation 1

Motion for debate: The redistribution of population in city has intensified the problem of traffic congestion due to long distance commuting.

The debate can be conducted in two teams, one team for the motion and the other against. Three to four students may form a group to serve as affirmative speaker, partners and principal speaker. The teacher may serve as the chairman. Other students are required to jot down arguments for further discussion.

Situation 2

Motion for debate: Restriction on the use and increase in the number of automobiles is the best means to solve traffic congestion in the city centre.

The debate can be conducted in the form of a forum, students are assigned different roles, e.g. officer in the Transport Department, a District Board member, a citizen, a town planner. The teacher may act as the chairman. Other students act as audience and are allowed to raise questions. After the debate, students may be required to write an essay or a commentary on the topic.

(4) Using Source Information

A large variety of learning activities is possible based on a range of source information. The following are examples of sources for obtaining information and the appropriate learning activities for the sixth form level that can be organized:

(a) *Using geographical tools such as maps, photographs and statistics*

These sources are essential and should be frequently used to help students to learn and apply various geographical concepts and skills. Different kinds of data-response activities can be organized, e.g. answering data-response questions, holding group discussion. Maps are a particularly important source of information and their use in teaching this curriculum is dealt with separately at the end of this section.

(b) *Using audio-visual resources*

These are especially useful in dealing with topics/examples which are abstract or remote to students' experience. For example, motion animation from films, videotapes, computer simulation, etc., helps students to better visualize/understand physical processes at work.

(c) *Collecting first hand information*

Students can collect first hand information from visits, interviews and fieldwork. The activities allow opportunities for students to apply various geographical concepts and skills. A report may then be written using the information collected.

(d) *Using the school library*

Students search for information from books, documents and magazines to complete a project or an essay.

(e) *Using the mass media*

Students obtain up-dated information from television, newspapers and radio broadcasting to prepare for a discussion or a debate.

The use of different sources of information increases students' interest in geography as well as enhancing various methods of gathering/handling information. Students can learn to select, classify and analyse materials.

Whatever source of information is used or activities organized with reference to a certain source of information, it is important that students should be able to achieve the following:

- (a) extract relevant information from varying sources of data,
- (b) identify the main components and linkages of an issue or within the system,

- (c) organize information coherently,
- (d) simplify information for representation, and
- (e) draw explanatory inferences in the context of the geographical concepts learnt.

IMPORTANT POINTS TO NOTE:

- (a) Students should be clearly instructed of what task to perform with the given information.
- (b) Some information has to be simplified, trimmed or reorganized before it can be effectively used.
- (c) Avoid giving too much information to handle in a lesson.

Mapwork in the sixth form geography curriculum

The use of maps is indispensable in learning geography because of its value as a source of spatial information. The following paragraphs outline the treatment of mapwork at the sixth form and identify topics which can be studied with reference to maps.

The basic purpose of mapwork is to develop students' ability to interpret a map. This provides information about the location, pattern and spatial distribution of natural and cultural phenomena and in doing so mapwork can be used to build up or illustrate concepts. Learning through mapwork should be encouraged throughout the whole curriculum. In general, two major types of maps are used—thematic and topographic maps. Thematic maps are maps of specific themes like soil type, temperature, land use, etc. Topographic maps normally show contour patterns, natural features as well as man-made features. Students need exposure to both.

Maps provide a useful basis for assessment. Structured questions may be set on topographic maps of different scales to assess students' map reading and interpretation skills as well as their knowledge of organizing concepts in geography. Topographic maps of Hong Kong on scales of 1:1000, 1:20000 and 1:50000 are readily available and appropriate for mapwork. Extracts of overseas topographic maps are equally helpful and should be related to the landscape selected for study.

Approaches to mapwork range from map reading and interpretation to construction of simplified maps based on available information. Apart from basic map reading skills and analysis, students are expected to extract and infer information from maps, generalize the information and present the information by sketch maps. Mapwork can also be combined with photograph interpretation. This often requires students to relate features shown on air photographs to those found on maps. Mapwork should not be confined to the classroom, but should be extended to the study in the field.

The following are examples of topographic map exercises on relevant themes in the syllabus:

Natural landscapes

- delimit drainage basin boundary, stream order, vegetation zones, etc.
- measure basin area, stream length, stream gradient, etc.
- identify patterns of relief, drainage, slope form and steepness
- designate stream orders, calculate bifurcation ratio and drainage density
- identify the characteristic physical and man-made features distinctive of a particular landscape

Agricultural landscapes

- identify the pattern and analyse the distribution of rural settlement
- relate farming land use to the physical setting of a certain area
- identify the spatial characteristics of the major farming systems
- relate the rural land use pattern to a theoretical model

Urban and industrial landscapes

- identify the location, spacing, size and function of urban settlements
- differentiate the locational characteristics of settlements of different functions
- identify the locational characteristics of different types of industry

(5) Project Work

Project work involves an in-depth study of any topic or problem from a number of different angles. It allows students to do their own research following their particular interests, work at their own pace, develop the ability to discriminate and employ various skills in completing the project. Students learn how to co-operate and take up specific responsibilities where it is organized on a group basis.

There are various approaches in project work. The teacher should assign work according to the age and ability of individuals or the whole group. Responsibilities should be delegated to the students who need the freedom to decide how to obtain information and present their work.

IMPORTANT POINTS TO NOTE:

- (a) Enormous quantities of material concerning a topic may be required. A good time schedule is needed for the preparation.
- (b) Composition of groups needs care, e.g. it is advisable to consider the abilities of students within a group.

- (c) The activities to be conducted should be well-structured and clear instructions on working procedure have to be given to avoid misinterpretation of the topic and to facilitate preparation for the activity.

Example

Topic: APPLICATION OF AGRICULTURAL MODEL(S) IN REAL WORLD SITUATION

Situation 1

Students study the land use pattern of a number of agricultural areas at a given time or that of one agricultural area at different time. Students may be required to test hypotheses set by the teacher or by themselves. A report illustrated with maps, graphs and statistical tests is then written up.

Situation 2

Students first carried out a piece of fieldwork, e.g. to map land use pattern of an agricultural area and interview farmers. The first hand information is then used to test the applicability of different models. Based on the results of the test, conclusions can be drawn on how and why the theoretical models are/are not applicable in the area under study. Findings may then be presented as board displays in the geography room.

(6) Fieldwork

Fieldwork includes most geographic work conducted outside the classroom. It can be incorporated into the geography course at different stages of teaching and learning, e.g. for introductory purposes, as a part of the development processes and for consolidation purposes at the end of a course. To meet the requirement of the curriculum, students should have no less than five full days of fieldwork experience in the two years of sixth form study.

Fieldwork provides good opportunity to study the relationship of man and his environment at first hand. In addition, fieldwork can help develop students' attitudes towards co-operative working and living as well as the proper attitudes towards environmental conservation. Through fieldwork, students are trained to accept responsibility and to work both individually and collectively within a group.

Students participating in fieldwork need to develop a range of skills, including setting objectives, formulating hypotheses, collecting data, presenting findings, making comparisons, testing ideas and predictions, solving problems and making decisions. They are also expected to

perform more sophisticated tasks such as testing models and theories with field evidence and to develop enquiry mind and environmental awareness. This includes a critical appreciation of the ways of maintaining and improving the natural and cultural environments, and readiness to contribute to the planned, rational and balanced use of the environment.

At the sixth form level, fieldwork should be student-centred. The role of the teacher is to help students to organize their work by providing clear pre-trip briefing and students are as far as possible encouraged to work on their own in the field.

IMPORTANT POINT TO NOTE:

Careful preparation before conducting the fieldwork and suitable follow-up activities in the classroom are essential for a successful fieldwork.

Example

Teaching Strategy: Fieldwork (observation, interview)

Landscape: Urban Landscape

Theme: (i) Urban spacing and urban function—a test of application of the Christaller model
(ii) Urban problems and possible solutions

Location: Sha Tin

Duration: 3 hours

Objectives:

The activity will help students to acquire knowledge of the

- (a) development and planning of Sha Tin New Town,
 - (b) problems of the new towns and possible solutions,
 - (c) range of services of the shopping centres,
 - (d) pattern of journey to work and shop,
 - (e) pattern of recreation, and
- skills of
- (f) constructing questionnaire and hypothesis,
 - (g) surveying and selection of samples,
 - (h) interviewing,
 - (i) testing hypothesis,
 - (j) writing reports.

Procedure:

1. Pre-trip Preparation

- (a) The class works in groups of 5 to 6 students.
- (b) Each group constructs a hypothesis and a questionnaire related to the knowledge objectives listed above. For example:
"People of higher income spend more time on journey to work."
"Larger shopping centres have longer range of service."
"Younger residents have recreational activities outside Sha Tin more often".
- (c) Briefing sessions are conducted to clarify the following:
 - the work to be undertaken by each group,
 - the vicinity where fieldwork is to be conducted,
 - interviewing techniques,
 - determine population, sampling size and sampling method.
- (d) Students conduct library research and watch relevant TV programmes to gather background information on Sha Tin New Town.

2. Fieldwork

- (a) Select samples in the field.
- (b) Conduct questionnaire interviews.

3. Follow-up Work

- (a) Analyse questionnaire data.
- (b) Interpret the data and use the results to test hypothesis set.
- (c) Complete fieldwork report.

Some topics of the sixth form geography curriculum suitable for fieldwork

Natural landscapes

- identifying and explaining factors which cause micro-climate variation in different habitats
- downstream change of stream flow and channel characteristics
- collecting data of the discharge, flow speed and load on a selected river
- soil studies in different habitats—e.g. woodland and bare slope
- measuring slope profile and identification of slope characteristics

Agricultural landscapes

- using systems approach to examine the operation of a local farm
- farm pattern and validity of classical agricultural models in the Hong Kong situation

- the effect of urbanization and industrialization in changing lifestyle in the rural area

Urban and industrial landscapes

- environmental quality assessment to show deterioration of an urban environment
- relationship between the size of settlements and the number of services found in the settlements
- investigating conflicts that arise over the use of land in particular places
- examine the factors that have influenced the location and growth of settlements and the benefits and problems that accompany such growth
- locational advantages of a planned industrial district
- waste products and environmental impacts of factory activities in a local area

C. Assessment

i. *Purposes of Assessment*

This section outlines some suggestions concerning the assessment of students' performance. The main reasons for assessment may include the following:

- (a) to motivate both students and teachers,
- (b) to measure and monitor students' standards,
- (c) to evaluate teaching objectives against learning outcomes,
- (d) to diagnose learning difficulties and learning needs,
- (e) to find out what students know, understand and can do,
- (f) to better equip students to prepare for the internal and external examinations.

Assessment has both a formative and summative effect. The purpose of formative assessment is to enhance students' learning. It is important to note that teachers should not rely solely on summative assessment which usually takes the form of end-of-course tests/examinations. It is important to integrate assessment within the teaching and learning process. Formative assessment is vital during the two-year teaching and learning period. Diversified assessment methods are needed to enhance learning as students may learn in a variety of ways and at different rates.

ii. *Types and Methods of Assessment*

Types of assessment within a school situation can be subdivided into informal and formal. In general, informal assessment is more subjective. It includes assessments conducted on a day-to-day basis such as observation, oral assessment. Flexibility, responsiveness to students' needs and the provision of immediate feedback are the merits of this type of assessment.

Formal assessment mainly includes tests and examinations. These are more objective and usually administered at set intervals. Providing detailed feedback to individual students after such assessment is time-taking but rewarding.

A particular assessment method may be used either formally or informally depending on the treatment concerned. Nevertheless the assessment method must relate to, and be appropriate for, the learning objectives of the geography course. The following methods are suggested for reference. These methods are neither exhaustive nor prescriptive. To enhance teachers' understanding of these assessment methods and their application to the teaching of the syllabus, a discussion on the unique nature and the principal ways of these methods are included.

(1) Observation

Principal Ways

- (a) Concise and precise comments about students' daily performance. Teachers are encouraged to use a log book or a file to record their comments, e.g. one page per student. If possible, the date and occasion should also be recorded. These kinds of records can provide some evidence for teachers to draw up informal comments.
- (b) Interviews with students. To reduce workload, interviews may be conducted in groups.

Comments

This is subjective but a reliable way to understand the performance, learning needs and learning difficulties of individual students. Through day-to-day personal contact, it is easier for teachers to identify the learning characteristics of students. This information may be useful for teachers to tailor teaching activities to enhance students' learning.

(2) *Objective Test*

Principal Ways

- (a) True/false tests
- (b) Fill in the blanks tests
- (c) Matching tests
- (d) Multiple-choice tests
- (e) Short question tests

Comments

They are easy to administer and to mark, but the main challenge is to devise suitable questions which go beyond the recall of facts. They can be effectively used as a means of revision exercise or short test immediately after a topic is taught to help students grasp the key ideas.

(3) *Essay*

Principal Ways

- (a) Timed-essays (to be completed within a specified duration e.g. 45 minutes)
- (b) Extended-essays (to be completed at home)

Comments

They are more difficult to mark when compared with objective tests. It is important to set criteria by which marks are assigned to different levels of argument. By this means the worst fault of marking factual points can be avoided. This conventional assessment tool, if carefully designed, can assess a range of skills, attitudes and knowledge. The cognitive development ranging from factual recall to synthesis and evaluation of a sixth form student can also be fully reflected through essay writing. Students can learn best when they have to present what they have learnt which is a product of thinking process and this involves the proper organization of ideas and arguments. Detailed constructive feedback from teachers are an eventual means to guide students and improve their capability for study.

(4) *Structured Questions*

Principal Ways

- (a) These cover a large variety of questions and responses. They often involve students in description, transformation and analysis of data.
- (b) Students can also be asked to evaluate the method of data presentation, or the situation described by the data.

Comments

This is a very flexible means of assessment. A wide range of graphical, written and pictorial materials can be incorporated into this kind of questions. These questions assess a wide range of skills and knowledge. They provide a comprehensive coverage of the syllabus content.

(5) Oral Assessment

Principal Ways

(a) Discussion

(b) Presentation: students prepare and present a verbal report

Comments

This method can be very motivating once shy students have overcome their initial hesitance. However, this method is very time consuming. A commonly agreed set of procedures and criteria is the key element for a fair and balanced assessment.

(6) Self Assessment

Principal Ways

(a) Checklists

(b) Evaluation sheets

(c) Tutorial meetings, individually or in small groups

Comments

This method is not easy to standardize and validate as there are no absolutely right or wrong answers. But it is a very rewarding exercise as it leads to a deeper understanding of an individual's own strengths and weaknesses. It also serves to reflect one's personal development. This assessment method is particularly useful for evaluating changes in values and attitudes.

D. Course Evaluation

Course evaluation is an important component of successful and effective teaching. The purpose of this section is to encourage teachers to undertake evaluation to assess how successful their teaching is and to outline some simple but practical points to note in carrying out such evaluation. In-depth treatment of evaluation rationale and models is not provided. Teachers interested in these aspects may refer to publications specially written for this purpose.

To ensure successful teaching and learning of the sixth form geography course, regular and constant review of the preparation work, teaching strategies and learning outcomes is necessary. An accurate and fair

reflection of what have been done would be essential in providing the necessary information for judging the effectiveness of the teaching strategies and learning activities.

To achieve effective course evaluation, teachers as self-evaluators need to:

- (a) be sure of the purpose of a specific evaluation task,
- (b) choose an appropriate means of data collection and analysis (for example, questionnaire, checklist, student achievement test, discussion, interview and results of external examination),
- (c) use criteria appropriate to the context of the geography course, such as the stated objectives of the sixth form geography course to determine the performance of students in the achievement tests or daily assignments.

Evaluation should be on-going and it should form an important and challenging part of the geography teachers' daily activities. Because of time constraints, a systematic and well designed evaluation exercise cannot be frequently taken; however, geography teachers can get a general picture of the effectiveness of the teaching and learning process through the following means:

- (a) The teaching progress is a valuable means to provide objective information whether the teaching schedule can be followed or has been well planned. If it cannot be followed, what discrepancies can be identified and what remedial actions need to be taken.
- (b) The response of students is another area of vital information which will help teachers to select appropriate teaching strategies. Students' responses can be gained and assessed through daily observation and conversation, discussion and questionnaire.
- (c) Students' preparation for lessons and their enthusiasm in participating in learning activities are useful criteria for judging the suitability of the course for them.
- (d) Students' performance in their assignments, tests and examinations reflect the learning outcomes. This is an important index of the effectiveness of the teaching and learning process. Thus the types and methods of assessment used to assess students' performance and progress mentioned in the earlier section on assessment in this unit also provide valuable information for evaluation.

APPENDIX I: SUGGESTIONS ON THE APPLICATION OF ORGANIZING CONCEPTS TO TEACHING

Part I: Landscapes

Landscape refers to distinctive scenery containing composite features that form a place. With the emphasis on visual manifestation, landscape studies are eased by fieldwork, photo study, slide/film show, mapwork, etc. The essence of study lies in the examination of spatial association and interdependence of man and the environment which gives areal distinctiveness. Below is a table showing elements and issues which may serve as a reference for class teaching when examining the natural and/or cultural aspects of a landscape.

Landscapes	Landscape components/forms/features*	Suggested Issues/Questions**
NATURAL LANDSCAPES		
Atmospheric phenomena	Atmospheric components: cloud, rain, snow, dew, hail, fog, mist, amount of shade/sunshine, etc.—their occurrence and variation in tropical humid, tropical arid and polar environments	Is the absence of cloud a distinctive atmospheric phenomenon in deserts? "Rain of tropical rain forest is an effective agent in producing a landscape different from that of desert." How far do you agree?
Landforms related to plate tectonics	Major relief divisions: mountain belts, plains, etc. Catastrophes resulting from tectonic instability: earthquakes, volcanic eruptions, etc. Evidence of crustal movement: fold mountains, mid-oceanic ridges, fault belts, etc.	What is the spatial distribution of major landform features and how do they relate to tectonic movements of the earth? "Features produced by the movement of tectonic plates are found only on or near to their margin." Is the generalization true?
Drainage basins and channels	Drainage basin and channel characteristics — basin shape, basin size — streams: main stream, tributaries — drainage density and patterns — matters along channel: water, sediment, etc. — channel form: plan, long profile, cross profile	Find evidence in the field to show how channel gradient affects velocity. Describe the basin characteristics and relate them to explain the erosional and depositional work of a channel. Describe the explain the process-response phenomena of sediment load and discharge along a river course. Why are some sections of rivers more likely to flood than others? "Channel protection may give economic gain but ecological loss." How far do you agree?

* Components/forms/features which can be easily observed in real life situation.

** Issues/Questions which can be used to reinforce skill and value of landscape study.

Landscapes	Landscape components/forms/features	Suggested Issues/Questions
Weathering and slope	<p>Landscape features that resulted from weathering, mass wasting and erosion, their variations in tropical humid, tropical arid and polar environments</p> <p>Slope: gradient and forms (cross-section, longitudinal profile)—its variation in tropical humid, tropical arid and polar environments</p>	<p>What characteristics of environment contribute to the formation of unique weathering and mass wasting processes in polar regions?</p> <p>How can the denudation processes explain the topography and vegetation cover of a landscape you have studied?</p> <p>Use two photos you have shot in the field to illustrate why and in what ways slopes differ in form.</p>
Soil and vegetation	<p>Soil</p> <ul style="list-style-type: none"> — properties: texture, colour, composition, humus, etc. — soil profiles of major soil groups — world distribution <p>Vegetation</p> <ul style="list-style-type: none"> — major biomes: forest, woodland, grassland, desert — world distribution — physical properties of major biomes: layer structure, height, canopy form, density, variety, vertical and horizontal distribution, etc. <p>Changing characteristics of soil and vegetation: plant succession zones, soil catena, etc.</p>	<p>How can variation in plant distribution be explained by the changes in physical properties of soils?</p> <p>Write a hypothesis to show the spatial variation of plants along a transect and then test the hypothesis by citing appropriate examples in the field.</p> <p>Relate the drainage, plant and soil of an area to exemplify the functional interaction of the biotic and abiotic environment.</p> <p>Compare and contrast the environmental factors which affect the soil and vegetation of tropical humid and polar environments.</p> <p>Referring to a tropical rain forest, explain why climax vegetation fails to persist and suggest programmes to help the government to deal with the problem.</p>
Man-land relationship	<p>Influence of environment on human use of the land: e.g. shifting cultivation, terracing</p> <p>Man's modifications on the land: e.g. land reclamation</p>	<p>List the possible measures that could be taken to help exploiting the forest resources but not upsetting the ecological equilibrium of a landscape.</p>

Landscapes	Landscape components/forms/features	Suggested Issues/Questions
AGRICULTURAL LANDSCAPES	<p>People on the land: farmers, their families, etc.</p> <p>Farm structures: field, farmstead, silo, etc.</p> <p>Land use: e.g. cultivated land, fallow field</p> <p>Agricultural activities: e.g. grain farming, transplanting, crop rotation, animal shearing, spraying of weedicide</p> <p>Rural transport: form of network, mode, etc.</p> <p>Rural settlement: site, distribution</p> <p>Rural infrastructure: drains, windmills, dams, etc.</p> <p>Damages made by farm hazards on the land: e.g. flooded field, damaged building</p> <p>Structures particularly designed for conservation of agricultural resources: e.g. river embankment</p>	<p>Examine the change of crop covers and explain the environmental factors associated with a farming landscape you have studied.</p> <p>Describe the variations in productivity per unit area and choice of crops of two selected areas you have studied and explain such variations in relation to the environmental factors that prevail in the areas.</p> <p>Evaluate the influence of factors on the farming activities you have observed in the field and suggest measures which could further raise the production efficiency of the land.</p> <p>Refer to a farming landscape you have studied, assess the merits of alternate strategies that have been made to reduce problems and potential hazards of the area.</p>
URBAN LANDSCAPES	<p>Urban settlements</p> <ul style="list-style-type: none"> — type/form: market town, dormitory town, etc. — site, size, location & spacing — functions of settlement: order of goods/services — centres of different order: neighbourhood centre, central business district — transport links — infrastructure — amenities 	<p>With reference to specific areas you have investigated, discuss the view that modern settlements have tended to be more orderly spaced.</p> <p>Quoting examples, examine how the pattern of goods/services available in a town can be explained by the size and consumption behaviour of population of the area.</p> <p>Conduct a survey (which probably involves map and library work) to show the size and distribution of towns and cities of a country and explain how they can fit into the pattern suggested by the rank-size rule.</p> <p>Visit a town. Identify the central place functions present in the town. Discuss the problems that have arisen in defining the central place function of the town.</p>

Landscapes	Landscape components/forms/features	Suggested Issues/Questions
	<p>Urban land use</p> <ul style="list-style-type: none"> — types: commercial (retailing/wholesaling), industrial, transport activities, institutional, etc. — location and spatial pattern — vertical and horizontal zones of urban land use in a city <p>Housing</p> <ul style="list-style-type: none"> — types: squatter, private, public, etc. — forms: tower block, terraced, detached, etc. — location and spatial pattern <p>Transport</p> <ul style="list-style-type: none"> — modes: road, rail, etc. — spatial pattern: nodes—port, airport, car park, transshipment point — link/route 	<p>Referring to a land use map of a city, examine the areal specialization of functions within the city. Discuss how the pattern can be generalized by Burgess's theory.</p> <p>"Certain activities cannot afford high rent but still occupy the most accessible site." Quoting examples from your experience, explain why such patterns take place.</p> <p>What are the geographical effects of squatter and public housing in city areas? Suggest ways to contrast their environmental qualities in the field.</p> <p>Conduct a traffic survey in your school environment. "Restriction of the use of automobiles is the best means to solve urban traffic problem." How far do you agree?</p>
INDUSTRIAL LANDSCAPES	<p>Industrial structures: factory building, storage houses, workers' quarters, etc.</p> <p>Industrial land use: spatial distribution—site and location, vertical and horizontal zones</p> <p>Types of industry: e.g. processing industry (textile), fabricating industry (car-making)</p> <p>Structures specially designed to reduce environmental problems of industrial production: sewage system, smoke-emission system, etc.</p>	<p>What are the factors that make different industries to locate at different sites? Quote specific examples to discuss what the real world picture is.</p> <p>"Local industries affect the environment in different ways." Conduct a visit to a local industrial area and write a report to show how the statement is true.</p>

Part II: Systems

A system is a set of related components organized for a particular purpose, the whole being identifiable by the interconnection of the components. The set of components may refer to things, substances, structures, processes or activities which are associated and interconnected, forming and functioning as a unique whole.

Suggested below are some of the characteristic features of various topics. These may help teachers to organize the learning elements such as by constructing systems diagrams for formulating a framework for system analysis in classroom teaching.

Systems	Components/Concepts	Related Interaction Processes
CLIMATIC SYSTEM/ EARTH-ATMOSPHERIC SYSTEM	<p>Heat transfer</p> <ul style="list-style-type: none"> — energy (solar/terrestrial radiation, heat, light) — net radiation, energy surplus, energy deficit, energy input/output <p>Moisture transfer</p> <ul style="list-style-type: none"> — water vapour — saturated/unsaturated air — latent heat <p>Air movement</p> <ul style="list-style-type: none"> — spatial variation of temperature — air pressure — pressure gradient — Coriolis force 	<p>Energy flow processes: radiation, convection, conduction, advection</p> <p>Albedo effect, greenhouse effect</p> <p>Condensation, precipitation, sublimation, evaporation</p> <p>Adiabatic (lapse rate) changes</p> <p>General circulation, trades/westerlies/polar wind, monsoon</p>
LANDFORM SYSTEMS		
Drainage Basin System	Precipitation, runoff, slope, catchment area, vegetation cover	Types of slope processes Types of channel processes
Weathering subsystem	Weathering agents, rocks/earth surface	Types of weathering
Slope subsystem	Slope, gravity, denudation agents, climatic and environmental factors	Types of slope processes
Channel subsystem	Drainage basin properties, climatic and environmental factors, change of water flow	Processes of erosion, transportation and deposition (including cross-sectional and long profile changes of channel)

Systems	Components/Concepts	Related Interaction Processes
BIOTIC SYSTEMS		
Ecosystem	Biotic and abiotic components, storage compartments	Energy transfer, nutrient cycling Ecosystem stability
Soil as subsystem	Soil components: air, water, rocks, nutrients, etc. Environmental components: climate, plant, etc.	Soil forming processes
Vegetation as subsystem	Canopy, layering/structure, life form	Vegetation climax, succession, adaptation, desertification
FARMING SYSTEMS		
An ecological system	Energy, nutrient, crop/livestock and their ecological requirements Optimum location, energy transfer efficiency	Crop/livestock selection/production, land carrying capacity, environmental conservation
An economic system	Information, cash, human resources (e.g. man's decision), land use pattern Optimum location, minimum cost, maximum profit, locational models	Crop/livestock selection/production, distance-decay mechanism, market orientation of crop/livestock system
URBAN SYSTEMS		
Settlement system	Spacing, size, function of settlement, settlement pattern Models of settlement system	Central place function, city primacy, rank-size relationship
Urban land use system	Urban activities, land value, distance, accessibility, man as urban space consumer Land rent concept, land use models	Bid-rent function, concentration, dispersion

Systems	Components/Concepts	Related Interaction Processes
INDUSTRIAL SYSTEMS A production system A location system	Production factors (material inputs, markets, outputs), industrial linkages Production factors, factors of location Least-cost location, margin of profitability, locational models	Manufacturing processes: processing/fabrication processes Agglomeration, decentralization
URBAN-INDUSTRIAL COMPLEX AS AN ECOSYSTEM	Inputs: energy/fuel, water, people, etc.; outputs: export goods, waste/sewage/pollutant, etc.	Intra-urban interaction (e.g. urban transport), environmental deterioration, urban planning/urban renewal

Part III: Man-environment Systems

Man-environment systems are systems which imply the symbiotic relationship between people and their environment. Below are some suggested changes in environmental quality and issues which can serve as a reference for class teaching. Whilst some issues are of global concern, others often concern the geography of particular places. For example, the environmental impact of building a new airport in Hong Kong is not a matter of global concern and yet other cities may face problem of similar nature. On the other hand, atmospheric pollution in one country leading to acid rain falling in another country is a well-known issue of international concern. Once again, the list below is neither intended to be exhaustive nor prescriptive. To enhance the study of our dynamic environment and man as an integral part of it, there are numerous options to choose when preparing lessons.

Systems and related concepts	Changes in environmental quality	Issues/Topics (local or global)
CLIMATIC SYSTEM/ EARTH-ATMOSPHERIC SYSTEM Energy budget/radiation balance Atmospheric moisture and processes Atmospheric circulation and wind systems	Increase of the atmospheric carbon dioxide Changing characteristics of the ozone layer Changing characteristics of the ground surface albedo Thunderstorm, hailstorm, rainstorm, etc. Long period of raining/sun shining, etc. Changes of wind speed and direction	Global warming Ozone layer no longer serving as an efficient shield of the earth-atmospheric system Upsetting of the energy balance Man-induced temperature inversion Environmental hazards: flood, drought, etc., and related conservation measures Acid rain Atmospheric disturbances: typhoon, and man's responses
LANDFORM SYSTEM Plate tectonics and major landform features Drainage basin: weathering sub-system, slope sub-system, channel sub-system	Tectonic activities and their effects on crustal platforms (plate margins) for terrestrial activities Change of watershed components (e.g. rise in rainfall input, fall in ground water recharge.)	Environmental hazards: volcanic eruption, earthquake, etc. Hazard prediction measures Man-induced basin changes (slope failure, erosion, etc.) and the related conservation measures Man-induced form and rate of channel flow (the effects of which may be positive and negative)

Systems and related concepts	Changes in environmental quality	Issues/Topics (local or global)
<p>URBAN-INDUSTRIAL COMPLEX AS AN ECOSYSTEM</p> <p>Housing problem, transport problem, impact on the quality of the environment</p>	<p>Disequilibrium in the demand and provision of housing and transport facilities</p>	<p>Overcrowding, lack of activity/open space, lack of amenities, etc.</p> <p>Environmental impact of urban slum</p> <p>Environmental impact of industrial concentration</p> <p>Environmental impact of a mass transit system</p> <p>Urban climate and the related pollution problems</p> <p>Over-urbanization and problems of pseudo-urbanization/primacy</p> <p>Problem of waste disposal</p> <p>Problem of population redistribution</p>

APPENDIX II: SOME REFERENCE MATERIALS FOR GEOGRAPHY TEACHERS

1. Periodicals

- (1) *Focus*, Monthly publication, The American Geographical Society, 156 Fifth Avenue, Suite 600, New York 10010, U.S.A.
- (2) *Geofile*, Standley Thornes (Publishers) Ltd., Old Station Drive, Leckhampton, Cheltenham, Glos. GL53 0DN, England.
- (3) *Geography Review*, Quarterly publication, School of Geography, University of Oxford, Mansfield Road, Oxford OX1 3TB, U.K.
- (4) *Journal of Geography*, Monthly publication, The National Council for Geographic Education, Indiana University of Pennsylvania, Indiana, PA 15705, U.S.A.
- (5) *Teaching Geography*, A quarterly publication by the Geographical Association, 343 Fulwood Road, Sheffield S10 3BP, U.K.

2. Reference Books

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- (5) Briggs D. & P. Smithson, *Fundamentals of Physical Geography*, Hutchinson, 1985.
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- (17) Gordon G. & W. Dick, *Urban Geography: Models and Concepts*, Holmes McDougall, 1980.
- (18) Hanwell J.D., *Atmospheric Processes*, Unwin Hyman, 1980.
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- (20) Hilton K.D., *Process & Pattern in Physical Geography*, 2nd Ed., Unwin Hyman, 1979.
- (21) Knapp B.J., *Systematic Geography*, Unwin Hyman, 1986.
- (22) Martin F. et al, *Nature of Environments: Teachers' Notes and Activity Sheets*, Heinemann Educational, 1987.
- (23) McBride P.J., *Human Geography: Principles, Processes and Patterns*, Blackie & Son, 1980.

- (24) O'Hare G. & J. Sweeney, *The Atmospheric System: An Introduction to Climatology and Meteorology*, Oliver & Boyd, 1986.
- (25) O'Hare G., *Soils, Vegetation, Ecosystems*, Oliver & Boyd, 1988.
- (26) Park C., *Environmental Hazards*, Macmillan, 1986.
- (27) Peart M. & P.G. Stimpson, *Approaches to the Teaching of Geography: The Hydrological Cycle and the Drainage Basin*, The Faculty of Education, University of Hong Kong, 1990
- (28) Strahler A. N. & A. H. Strahler, *Geography and Man's Environment*, John Wiley & Sons, 1977.
- (29) Tivy J. & G. O'Hare, *Human Impact on the Ecosystem*, Oliver & Boyd, 1981.
- (30) Waugh D., *Geography: An Integrated Approach*, Nelson, 1990.
- (31) Wiegand P., *Managing the Geography Department*, The Geographical Association, U.K., 1989.
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