

# Geography

For first examinations in 2005





# DIPLOMA PROGRAMME

## GEOGRAPHY

First examinations 2005

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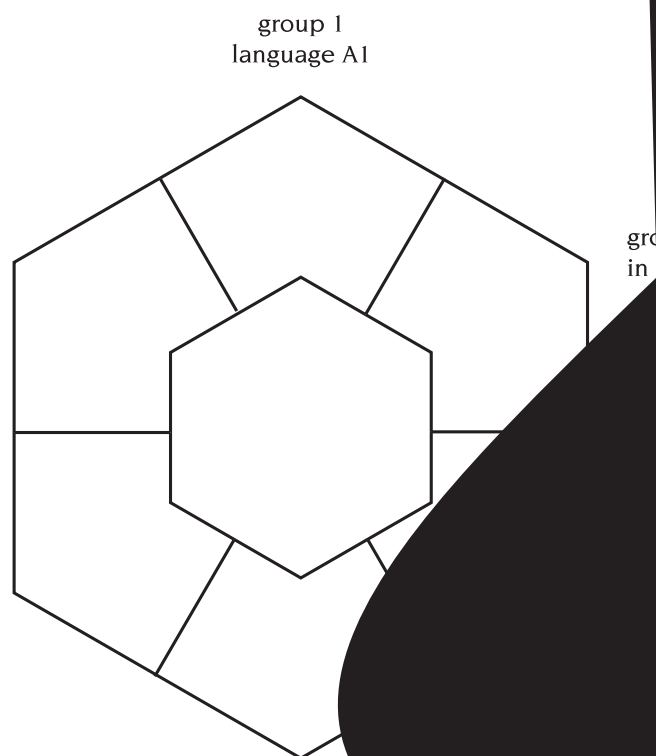


# INTRODUCTION

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The International Baccalaureate Diploma Programme (DP) is a rigorous studies, leading to examinations, that meets the needs of highly motivated students between the ages of 16 and 19 years. Designed as a comprehensive two-year programme for graduates to fulfill requirements of various national education systems, the DP is a pattern of no single country but incorporates the best elements of many. It is offered in English, French and Spanish.

The programme model is displayed in the shape of a hexagon with six academic areas at its core. Subjects are studied concurrently and students are exposed to the two groups of subjects: the humanities and the sciences.



Distribution requirements ensure that the science-orientated student is challenged to learn a foreign language and that the natural linguist becomes familiar with science laboratory procedures. While overall balance is maintained, flexibility in choosing HL concentrations allows the student to pursue areas of personal interest and to meet special requirements for university entrance.

Successful DP students meet three requirements in addition to the six subjects. The interdisciplinary theory of knowledge (TOK) course is designed to develop a coherent approach to learning that transcends and unifies the academic areas and encourages appreciation of other cultural perspectives. The extended essay of some 4,000 words offers the opportunity to investigate a topic of special interest and acquaints students with the independent research and writing skills expected at university. Participation in the creativity, action, service (CAS) requirement encourages students to be involved in creative pursuits, physical activities and service projects in the local, national and international contexts.

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# NATURE OF THE SUBJECT

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Geography is concerned with place. Understanding the nature and causes of areal differentiation on the global surface has been the geographer's task since people first noticed differences between places.

Through geography we seek to understand these differences in patterns of human distribution, interrelationships between human society and the physical environment, people's use of the Earth in time and space, and how these differences are related to people's cultures and economies. These, and other related themes, express major concerns of our time and reflect the consequences of spatial decisions.

In geography's pursuit of this understanding the questions "where?", "why?" and "how?" are central. The first of these introduces the issues of location and spatial choice; the latter two signify that modern geography is not content merely to describe but seeks to explain. Beyond these questions, geographers also ask "what if?" as a means of seeking alternatives and giving the subject an applied dimension that can assist decision makers in planning and developing at a variety of geographical scales.

Geography in the Diploma Programme is a social science and one of those subjects in group 3 concerned with the study of individuals and societies. The complexity and changing nature of human society seldom permit the type of precision expected in the physical sciences. Instead, the social sciences offer a variety of perspectives and methods of study. The answers to the broad and complex questions faced by geographers may therefore require the use of many approaches from various fields.

The concept of site—the physical characteristics of a place—is integral to understanding areal differentiation on the global surface. Like other social scientists, geographers focus on the patterns and interactions to be found on that surface, and not primarily on the natural processes that act on it from above or below. They recognize that interaction between humans and their environment has always been mutual, and that the growth of technology has increased the human capacity to modify the environment.

The view of geography presented in this syllabus is thematic in organization, human in focus and comprehensive in coverage. At its core are the interrelated themes of population, resources and development; the latter encompassing concepts derived from both economic and quality-of-life principles. Accompanying the core is a series of options in physical geography, each stressing issues of human management and response. A second series of options in human geography addresses the concept of the region and a sense of place, forms of settlement, and human production activities in agriculture, manufacturing and globalization. A third section provides an option demonstrating the importance of site in providing constraints on and opportunities for human activity and therefore affecting the landscape. Strongly skill-orientated, and highlighting the distinctive use of mapping and similar techniques by geographers, the option seeks to integrate the human and physical aspects of the subject through topographic maps, other maps and images.

# AIMS

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The aims of all subjects in **group 3, individuals and societies** are to:

1. encourage the systematic and critical study of: human experience and behaviour; physical, political, economic and social environments; the history and development of social and cultural institutions
2. develop in the student the capacity to identify, to analyse critically and to evaluate theories, concepts and arguments about the nature and activities of the individual and society
3. enable the student to collect, describe, analyse and interpret complex data and source material and to test hypotheses
4. develop an awareness in the student that human attitudes and beliefs are widely diverse and that the study of society requires an appreciation of such diversity
5. enable the student to recognize that the knowledge and methodologies of the subjects in group 3 are contestable and that their study requires the acceptance of uncertainty.

The aims of the Diploma Programme **geography** course at higher level and standard level are to enable students to:

1. develop a global perspective and a sense of world interdependence
2. develop an understanding of the interrelationship between people, place and the environment
3. develop a concern for the quality of the environment, and an understanding of the need to plan and manage for present and future generations
4. appreciate the relevance of geography in analysing contemporary world issues, and develop and modify values and attitudes in relation to geographical problems and issues
5. recognize the need for social justice, equality and respect for others; appreciate diversity; and combat bias, prejudice and stereotyping
6. develop an appreciation of the range of geographical methodologies and apply appropriate techniques of inquiry.

# OBJECTIVES

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There are nine assessment objectives for the higher level and standard level Diploma Programme geography course.

Having followed the **geography** course at higher level and standard level, students will be expected to:

1. demonstrate knowledge of relevant factual information, examples and case studies
2. use and apply geographical terminology
3. demonstrate understanding of geographical concepts and theories through the acquisition, selection and effective use of knowledge
4. demonstrate knowledge and understanding of spatial processes, patterns and interactions; and be able to recognize change at various scales and locations
5. recognize and appreciate the interaction between people, place and the environment
6. appreciate and understand the social, economic and political interdependence of peoples
7. understand the use of human and physical resources and evaluate the management strategies involved
8. recognize and appreciate the relevance of geography to contemporary world issues
9. demonstrate knowledge of and an ability to apply appropriate geographical methodologies and techniques relevant to geographical inquiry.

# SYLLABUS OUTLINE

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## Higher Level and Standard Level

*The Diploma Programme geography syllabus at higher level and standard level is divided into three parts: geographical skills, core theme and optional themes.*

### Part 1: Geographical Skills

Students are required to develop a number of geographical skills that must be introduced and developed throughout the syllabus as appropriate to the themes.

- 1.1 Locate and differentiate elements of the Earth's surface
- 1.2 Read, interpret, analyse and produce maps
- 1.3 Interpret topographic maps where appropriate to the optional themes
- 1.4 Read, interpret, analyse and construct graphs
- 1.5 Undertake statistical calculations to show patterns and changes
- 1.6 Manipulate and interpret data using quantitative techniques
- 1.7 Undertake geographical investigation
- 1.8 Produce written material

### Part 2: Core Theme

The study of the core theme is compulsory.

- 2.1 Population, resources and development

### Part 3: Optional Themes

For higher level the study of **four** optional themes is required. At least two must be selected from section A, and at least one from section B.

For standard level the study of any **two** optional themes is required, selected from section A, section B and/or section C.

#### Section A

- 3.1 Drainage basins and their management
- 3.2 Coasts and their management
- 3.3 Arid environments and their management
- 3.4 Lithospheric processes and hazards
- 3.5 Ecosystems and human activity
- 3.6 Climatic hazards and change

## Section B

- 3.7 Contemporary issues in geographical regions
- 3.8 Settlements
- 3.9 Productive activities: aspects of change
- 3.10 Globalization

## Section C

- 3.11 Topographic mapping

# SYLLABUS DETAILS

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## Higher Level and Standard Level

At both higher level (HL) and standard level (SL), the Diploma Programme geography syllabus consists of three compulsory parts:

- part 1: geographical skills
- part 2: core theme
- part 3: optional themes.

The third part, the optional themes, is subdivided into three sections (A, B and C) and requires a different number of themes to be studied at higher level than at standard level. HL students cover four optional themes and SL students cover two optional themes.

## Structure of the Syllabus

The first part, geographical skills, provides the skills that enable students to apply the techniques of geography and use appropriate terminology. It is essential that the skills are covered throughout the whole syllabus (at both HL and SL), are delivered through the content of the core and optional themes as appropriate, and are fully integrated into teaching rather than being treated in isolation.

The second and third parts, the core theme and optional themes, are divided into two columns: **content** and **learning outcomes** (as described below). Only topics listed in these columns will be selected for assessment in the examination papers.

Content	Learning Outcomes
<b>I.1 Topic</b> <ul style="list-style-type: none"><li>• sub-topic</li></ul>	This column clarifies the content by describing the level of knowledge and type of performance required. The learning outcomes define the limits of the topics and sub-topics. The action verbs within the learning outcomes define what is required.

The order of the content is not prescriptive in terms of curriculum delivery.

The core and optional themes cover areas of knowledge that are often affected by personal bias and value judgments. It is important that the teacher is aware of this and ensures that students are not only presented with the facts, but are taught the analytical skills to allow accurate interpretation and evaluation of these facts. It is also important to appreciate that, while generalizations are made to enable classification (especially, for example, into more economically developed and less economically developed areas of the world), these generalizations should not be so broad or so rigid that they hide the great diversity found within any single category.

## Specific Terminology

Terms used in this guide (and in the examination papers) to describe economic development within countries will be more economically developed country (MEDC) or less economically developed country (LEDC). However, students are free to use equivalent terms as set out in the following table.

more economically developed country (MEDC)	less economically developed country (LEDC)
economically more developed country (EMDC)	economically less developed country (ELDC)
developed	developing
North	South

## Primary and Secondary Data

Primary data is data collected in the field. Secondary data is data collected from published sources such as United Nations (UN) agencies, non-governmental organizations (NGOs), government publications, statistical yearbooks, telephone directories, censuses, the Internet or CD-Roms.

## Use of Case Studies and Examples

Case studies and examples are to be used where appropriate to illustrate content.

## Estimated Teaching Hours

The IBO recommends 240 and 150 teacher contact hours for higher level and standard level syllabuses respectively. The topics within each theme have been designed to require approximately the same amount of teaching time. Teaching the geographical skills must, however, be integrated into the whole content and is indicated by an asterisk (\*). Coursework at standard level should also be integrated into the whole content.

Higher Level		Standard Level	
Theme	Hours	Theme	Hours
<b>Geographical Skills</b>	*	<b>Geographical Skills</b>	*
1.1 Locate and differentiate elements of the Earth's surface		1.1 Locate and differentiate elements of the Earth's surface	
1.2 Read, interpret, analyse and produce maps		1.2 Read, interpret, analyse and produce maps	
1.3 Interpret topographic maps where appropriate to the optional themes		1.3 Interpret topographic maps where appropriate to the optional themes	
1.4 Read, interpret, analyse and construct graphs		1.4 Read, interpret, analyse and construct graphs	
1.5 Undertake statistical calculations to show patterns and changes		1.5 Undertake statistical calculations to show patterns and changes	
1.6 Manipulate and interpret data using quantitative techniques		1.6 Manipulate and interpret data using quantitative techniques	
1.7 Undertake geographical investigation		1.7 Undertake geographical investigation	
1.8 Produce written material		1.8 Produce written material	

Higher Level		Standard Level	
Theme	Hours	Theme	Hours
<b>Core Theme</b>		<b>Core Theme</b>	
2.1 Population, resources and development	<b>90</b>	2.1 Population, resources and development	<b>90</b>
<b>Optional Themes</b>		<b>Optional Themes</b>	
<b>Four</b> selected from the following lists		<b>Any two</b> selected from section A, section B or section C	
<b>Section A</b> (Select at least <b>two</b> from this section)		<b>Section A</b>	
3.1 Drainage basins and their management	30	3.1 Drainage basins and their management	30
3.2 Coasts and their management	30	3.2 Coasts and their management	30
3.3 Arid environments and their management	30	3.3 Arid environments and their management	30
3.4 Lithospheric processes and hazards	30	3.4 Lithospheric processes and hazards	30
3.5 Ecosystems and human activity	30	3.5 Ecosystems and human activity	30
3.6 Climatic hazards and change	30	3.6 Climatic hazards and change	30
<b>Section B</b> (Select at least <b>one</b> from this section)		<b>Section B</b>	
3.7 Contemporary issues in geographical regions	30	3.7 Contemporary issues in geographical regions	30
3.8 Settlements	30	3.8 Settlements	30
3.9 Productive activities: aspects of change	30	3.9 Productive activities: aspects of change	30
3.10 Globalization	30	3.10 Globalization	30
<b>Section C</b>		<b>Section C</b>	
3.11 Topographic mapping	30	3.11 Topographic mapping	30
	(4x 30)		(2x 30)
	<b>120</b>		<b>60</b>
<b>Fieldwork</b>	<b>30</b>	<b>Coursework</b>	<b>*</b>
<b>Total hours</b>	<b>240</b>	<b>Total hours</b>	<b>150</b>



## Part I: Geographical Skills

These skills are essential to the study of geography and reflect the subject's distinctive methodology and approach. Teaching the skills enriches the students' understanding of geography, and enables them to apply the techniques of geography and to use appropriate terminology. It is essential that the skills are covered throughout the whole syllabus, are introduced where appropriate depending on the context of the different themes and are not treated in isolation.

<b>I.1</b>	<b>Locate and differentiate elements of the Earth's surface</b>	<ul style="list-style-type: none"> <li>direction</li> <li>latitude and longitude</li> <li>grid and area references</li> <li>scale</li> <li>maps</li> <li>aerial, oblique and ground-level photography</li> <li>satellite imagery</li> </ul>
<b>I.2</b>	<b>Read, interpret, analyse and produce maps</b>	<ul style="list-style-type: none"> <li>isoline and isopleth maps</li> <li>sketch maps</li> <li>topological maps</li> <li>dot maps</li> <li>proportional symbols</li> <li>flow diagrams/charts</li> </ul>
<b>I.3</b>	<b>Interpret topographic maps where appropriate to the optional themes</b>	
<b>I.4</b>	<b>Read, interpret, analyse and construct graphs</b>	<ul style="list-style-type: none"> <li>scatter graphs</li> <li>line graphs</li> <li>triangular graphs</li> <li>histograms</li> <li>pie charts</li> <li>population pyramids</li> <li>compound graphs</li> <li>logarithmic graphs</li> <li>Lorenz curves</li> </ul>
<b>I.5</b>	<b>Undertake statistical calculations to show patterns and changes</b>	<ul style="list-style-type: none"> <li>totals</li> <li>averages, means, medians, modes</li> <li>frequencies</li> <li>ranges of data (differences between maximum and minimum)</li> <li>densities</li> <li>percentages</li> <li>ratios</li> <li>dependency ratios</li> </ul>
<b>I.6</b>	<b>Manipulate and interpret data using quantitative techniques</b>	<ul style="list-style-type: none"> <li>measures of correlation (including Spearman rank)</li> <li>measures of concentration and dispersion (including nearest neighbour and location quotients)</li> <li>measures of spatial interactions</li> </ul>
<b>I.7</b>	<b>Undertake geographical investigation</b>	<ul style="list-style-type: none"> <li>research and select relevant geographical information</li> <li>classify data</li> <li>analyse data</li> <li>describe patterns, trends and links</li> <li>make generalizations</li> <li>make inferences and predictions</li> <li>make and justify decisions</li> <li>draw conclusions</li> </ul>
<b>I.8</b>	<b>Produce written material (including essays, reports and investigations)</b>	<ul style="list-style-type: none"> <li>synthesize information</li> <li>develop clear and logical arguments</li> <li>present material in a clear and well-structured way</li> </ul>

## Part 2: Core Theme—Population, Resources and Development

The study of this theme is compulsory at both higher level and standard level.

Unlike any other population, humans are able to manipulate the environment to increase its carrying capacity. This interaction with the physical environment determines the availability of resources, especially food. This theme examines the nature of human populations and the human ability to exploit resources. Development is essentially a complex consequence of this exploitation and so it is appropriate that the three topics of population, resources and development are considered together.

The topics covered in this theme are all interrelated, and include areas of knowledge and geographical concepts that are also relevant to other themes. It is important that the common features between themes are noted and any interrelationships are emphasized. Students are expected to show an appreciation of the complexity of the geographical issues covered in this and the other themes.

There is a large amount of data available for some of the topics in this theme and students must be able to synthesize such data by establishing broad trends and identifying anomalies. In order to achieve this the use of both graphical and statistical techniques is essential.

Content	Learning Outcomes
<p><b>2.1 Population distribution and density at global and local scales</b></p> <ul style="list-style-type: none"> <li>• Factors influencing population distributions</li> </ul>	<p>Appreciate the broad, global distribution of population and analyse the distribution in more detail at a country level. Describe and quantify the spatial variations in a chosen country and explain the variations in terms of environmental, economic, historical, cultural and political factors.</p>
<p><b>2.2 Population fertility</b></p> <ul style="list-style-type: none"> <li>• Measurements of fertility</li> <li>• Sociocultural factors and fertility</li> <li>• Economic factors and fertility</li> <li>• Spatial patterns of fertility</li> </ul>	<p>Define crude birth rate, general fertility rate and total fertility rate, and gain an appreciation of their values relative to a range of countries with different economic and social development levels.</p> <p>Explain how fertility is influenced by factors including the status of women, level of education, nature of employment, type of residence, religion, health care and family status.</p> <p>Understand how fertility is influenced by the real and perceived cost of having children.</p> <p>Appreciate the broad, global patterns of fertility and be able to describe and account for these patterns.</p>

Content	Learning Outcomes
<p><b>2.3 Population mortality</b></p> <ul style="list-style-type: none"> <li>Measurements of mortality</li> <li>Mortality differentials</li> <li>Geography of disease</li> </ul>	<p>Define crude death rate, age-specific death rate and life expectancy, and have some appreciation of their values relative to a range of countries with different economic and social development levels.</p> <p>Demonstrate an appreciation of the factors that can influence mortality rates (age, sex, residence, occupation, income, literacy, access to food, shelter and medical facilities). A more specific knowledge would be expected of those demographic and socio-economic factors responsible for the much larger variations in infant mortality (age of mother, birth order, birth interval, sex of baby, educational level of mother, status of women and income).</p> <p>Know a case study of a disease showing spatial diffusion, and be aware of the socio-economic consequences of the disease.</p>
<p><b>2.4 Population movement</b></p> <ul style="list-style-type: none"> <li>Causes of migration</li> <li>Modern migrations</li> </ul>	<p>Explain how migrations can be described in terms of push and pull factors and how they can be modified by the mobility potential of a population. Illustrate specific migrations using a variety of models, including Lee's model.</p> <p>Identify and explain voluntary and forced population movements between rural and urban areas and poor and rich areas, and also the population displacements resulting from war and/or environmental disruptions.</p> <p>Know the consequences of such movements at both points of origin and destination.</p> <p>Show a more detailed knowledge of a specific refugee movement case study.</p>
<p><b>2.5 Population structure</b></p> <ul style="list-style-type: none"> <li>Measurable characteristics, age–sex pyramids and dependency ratios</li> <li>Changes in population structure: the demographic transition model</li> </ul>	<p>Know the components of population structure (age, sex, education, occupation, religion, socio-economic status, ethnic and marital status) and how this data is collected. Analyse age–sex pyramids in terms of overall shape, proportions in age, proportions in gender groups and breaks in slope, as well as changes over time.</p> <p>Calculate and interpret dependency ratios, growth rates (positive and negative) and doubling times.</p> <p>Identify and explain changes in population structure from data presented graphically or statistically.</p> <p>Describe and account for changes in the various stages of the demographic transition model. Apply the model at a global and national level and be aware of the model's limitations. Interpret the way changes in the demographic transition model could be reflected in population pyramids.</p>

Content	Learning Outcomes
<p><b>2.6 Population and resources</b></p> <ul style="list-style-type: none"> <li>• Concept and classification of resources</li> <li>• Population–resource relationships</li> <li>• Population projections and policies</li> </ul>	<p>Distinguish between stocks, reserves and resources and define resources within particular contexts (environmental, cultural, economic, technological and political). Provide a classification of natural resources based on the concepts of renewable (flow) and non-renewable (capital) resources.</p> <p>Appreciate the relationship between population and the resource base (carrying capacity) in a natural environment, and describe and explain the way this relationship differs between human populations and their resource bases.</p> <p>This should be done by examining the theories of Malthus and Boserup, the views of neo-Malthusians (Club of Rome, Ehrlich) and contrary views, and population–resource regional classifications.</p> <p>Demonstrate an understanding of the UN population projections, the basis on which such projections are calculated and the reasons for undertaking them. Use case studies to describe, explain and attempt to evaluate pro- and anti-natalist population programmes.</p>
<p><b>2.7 Specific resource production and consumption</b></p> <ul style="list-style-type: none"> <li>• Patterns of production and consumption</li> <li>• Factors affecting patterns of production</li> </ul>	<p>Select one resource from the following list: water, fossil fuel, forest products. Describe the spatial distribution of production and consumption of the chosen resource and how this has changed over time and place.</p> <p>Analyse the reasons for changes in patterns of production and consumption in terms of economic development level, access to capital and technology, political and economic control and possible environmental and cultural factors.</p>
<p><b>2.8 Food as a resource</b></p> <ul style="list-style-type: none"> <li>• Hunger and malnutrition</li> <li>• Growth of food output</li> </ul>	<p>Define hunger and malnutrition in terms of calorie and protein intake and describe the distribution of both at a global scale. Show an awareness of the distinction between chronic (long-term) and periodic (short-term) hunger.</p> <p>This topic must be related to the earlier one on population and resources.</p> <p>Recognize the changes in food production over the past few decades: the decrease in production per capita at a regional scale but an increase in actual values at a global scale. Be aware that this has been the result of increases in cultivated land area (usually due to irrigation), changes in farming methods and technological innovations. Students are not expected to study any of these factors in depth.</p>

Content	Learning Outcomes
<p><b>2.9 Food production, trade and aid</b></p> <ul style="list-style-type: none"> <li>• Global imbalance in production and distribution of food</li> <li>• Trading patterns in food</li> <li>• Food aid</li> </ul>	<p>Be aware, having covered the previous topic, that there is a global imbalance in the availability of food. Relate this imbalance to economic development levels and to additional factors such as access to guaranteed markets, capital and technology, and government intervention.</p> <p>Describe the main flows of food exports and imports and provide an explanation for them in terms of trading agreements (subsidies, guarantees) and trading barriers (tariffs). A detailed knowledge is not expected, but specific examples to illustrate general statements should be provided.</p> <p>Provide a reasoned evaluation of the advantages and disadvantages of food aid, including examples and case studies.</p>
<p><b>2.10 Development</b></p> <ul style="list-style-type: none"> <li>• Concept of development</li> <li>• Indicators of development</li> <li>• Patterns of development</li> </ul>	<p>Understand that development is not only concerned with economic growth, but includes other aspects such as providing for people's basic needs, equity and social justice, sustainability and interdependence. Understand also that development applies not only at the global/international level but also at the local and national level. Appreciate that the causes of poverty and inequality are fundamental to understanding the concept of development.</p> <p>Be aware of the various indicators used to measure development, their validity and their limitations. These indicators range from the simple component indices, that usually measure only economic development (GNP per capita or energy consumption per capita), to the multiple component indices that are more inclusive and attempt to measure the quality of life (Human Development Index).</p> <p>Draw broad conclusions about the spatial pattern of development at the global scale using a variety of measures. Recognize patterns within a country (core–periphery) and comment on changes over time in these spatial patterns.</p>
<p><b>2.11 Issues in development</b></p> <ul style="list-style-type: none"> <li>• Issues in the “poorer” countries</li> <li>• Issues in the “richer” countries</li> </ul>	<p>Choose two countries at contrasting levels of economic development and cover the following issues in detailed case studies of each country.</p> <ul style="list-style-type: none"> <li>• access to basic needs and resources (especially safe water, food and shelter); the unequal distribution of wealth at the national scale; trade, aid and indebtedness; environmental quality</li> <li>• rates of resource consumption, foreign aid and loans, environmental quality</li> </ul> <p>Be aware that both these sets of issues do not exist in isolation and that every attempt should be made to identify and examine the relationships with other topics in this theme and any of the other themes.</p>

Content	Learning Outcomes
<p><b>2.12 Sustainable development and resource management</b></p> <ul style="list-style-type: none"> <li>• Concept of sustainable development</li>         <li>• Concepts of conservation, recycling and substitution</li> </ul>	<p>Understand that there is no single definition for sustainable development but the key idea common to all definitions concerns resource exploitation at a rate that would not prove detrimental to future generations. As a result of this key idea students should be aware of the concept of stewardship.</p> <p>Be aware of the range of scales at which sustainable development can be practised (from local through national to international) and the complex relationship it has with people and the environment.</p> <p>Explain how resources can be managed through conservation, recycling and substitution. Identify specific examples to illustrate each of these concepts by referring to different resources.</p>

## Choice of Optional Themes

At higher level the study of four optional themes is required. These must include at least two from section A, and at least one from section B.

At standard level the study of any two optional themes is required. These may be selected from any section.

In summary, the following combinations of optional themes are possible.

### At Higher Level

The following combinations of optional themes in each section to provide a total of four may include:

Section A	Section B	Section C
2	1	1
3	1	0
2	2	0

### At Standard Level

The following combinations of optional themes in each section to provide a total of two may include:

Section A	Section B	Section C
2	0	0
1	1	0
1	0	1
0	1	1
0	2	0

## Part 3: Optional Themes—Section A

The optional themes in this section are:

- 3.1 Drainage basins and their management
- 3.2 Coasts and their management
- 3.3 Arid environments and their management
- 3.4 Lithospheric processes and hazards
- 3.5 Ecosystems and human activity
- 3.6 Climatic hazards and change

Higher level students must study at least two of the optional themes in this section.

Standard level students must study any two optional themes, selected either from section A, section B and/or section C.

### 3.1 Drainage Basins and their Management

This theme views a drainage basin as an open system with inputs, outputs and feedback that attempt to maintain a dynamic equilibrium, and then seeks to look at the basin's physical components and the ways these are managed by humans. The management of drainage basins deals with issues and strategies, supply and demand and, in a number of instances, international relations. The theme of river basin management has close links with other themes such as resources, hazards, ecosystems, political geography and perception of landscape. This theme requires students to demonstrate mapping and graphing skills and to use case studies wherever appropriate.

Content	Learning Outcomes
<b>3.1.1 The drainage basin</b> <ul style="list-style-type: none"> <li>• Concept of a drainage basin as an open system</li> <li>• Operation of a drainage system</li> <li>• Mechanics of a drainage system</li> </ul>	<p>Understand the concept of a drainage basin by being able to delineate actual drainage basins on maps of appropriate scale. Understand that a drainage system is an open system that strives to maintain equilibrium through negative feedbacks.</p> <p>Understand the terms perimeter, watershed, catchment, stream order and bifurcation ratio.</p> <p>Be aware that drainage density and pattern vary within and between catchments.</p> <p>Understand the interplay of precipitation, evapotranspiration, interception, infiltration, throughflow, percolation, ground water store and flow, water table, surface flow or run-off, channel flow and water balance.</p> <p>Understand the impacts of moving water in a drainage basin, especially the change in velocity.</p> <p>Understand the following terms: types of flow, channel shape, bed roughness (hydraulic radius), gradient, transportation, competence, capacity, erosion and deposition.</p> <p>Understand the principle of Manning's roughness coefficient, if only to dispel the view that streams flow more slowly in their lower courses than in their upper ones. Calculation of the coefficient is not required.</p>



Content	Learning Outcomes
<ul style="list-style-type: none"> <li>Controls on a drainage system</li> </ul>	<p>Appreciate that controls should not be viewed in isolation from one another but as an interacting set contributing to the behaviour of a drainage system, most notably in times of flooding. Study the following controls: basin size, shape and relief (including slope), atmospheric controls, rock type, soil, land use and vegetation.</p> <p>Understand hydrographs and how they vary in form in response to controls, and how to use them as an aid to explain discharge.</p>
<p><b>3.1.2 Fluvial features in the landscape</b></p> <ul style="list-style-type: none"> <li>Landforms produced by erosion and deposition</li> <li>Natural and human-induced hazards</li> </ul>	<p>Understand the relationship between landforms and the processes that have created them, especially the interplay between erosion and deposition.</p> <p>Understand the evolution of fluvial or water-formed landscapes as the outcome of dynamic processes such as slope erosion, stream erosion and deposition.</p> <p>Understand that the principle underlying the relationship between velocity and particle size (as shown by the Hjulström diagram) is the basis for understanding erosion, transportation and deposition.</p> <p>Understand the formation of waterfalls and rapids, meanders and associated landforms, flood plains, braided channels, levees and deltas.</p> <p>Be aware that changes in base level can affect erosion and deposition in the basin, and understand the concepts of rejuvenation, knickpoints and terraces.</p> <p>Be aware of the processes of flooding (flash and lag responses) and the effect of humans on fluvial processes, including the effect of urbanization on stream flow and percolation; urbanization and forestry on both flooding and stream siltation and the impacts of agriculture, mining and industry. Flooding is a natural phenomenon that can be exacerbated by the effects of human activity. Understand that changes in land use can affect flood recurrence intervals.</p> <p>Study hazards in terms of risk vulnerability and response.</p>
<p><b>3.1.3 Managing the supply and demand for water</b></p>	<p>Understand that drainage basin management arises from matching water supply to demand from urban domestic needs, industry, hydro-electricity, irrigation, recreation and navigation.</p> <p>Illustrate water management strategies with reference to a specific case study.</p>
<p><b>3.1.4 Issues in water utilization at a variety of scales</b></p>	<p>Discuss issues of water utilization with reference to specific case studies; one at each of local, national or regional, and international scales.</p>

## 3.2 Coasts and their Management

This theme covers the four groups of factors whose interaction determines the nature of a coastal environment at any one time: terrestrial, atmospheric, marine and biological (including human). The coastal zone should be viewed as an open system and a spatial approach is required to ensure a geographical perspective. Issues and management strategies will be essential to maintaining a focus on interaction.

Content	Learning Outcomes
<b>3.2.1 Factors affecting the shoreline environment</b>	<p>Understand the terrestrial, atmospheric, marine and biological factors responsible for:</p> <ul style="list-style-type: none"> <li>• shorelines of cliffs</li> <li>• dunes</li> <li>• barriers</li> <li>• beaches</li> <li>• lagoons</li> <li>• estuaries.</li> </ul> <p>Be aware that humans play a significant role in altering the coastal zone, directly and indirectly, through buildings, pollution, tourism and recreation, sea defences, conservation and global warming.</p>
<b>3.2.2 Marine processes and landforms</b> <ul style="list-style-type: none"> <li>• Action of waves</li> <li>• Erosional landforms</li> <li>• Depositional landforms</li> <li>• Other coastal landforms</li> </ul>	<p>Understand the role played by the interaction of wind and wave energy, wave incidence, particle size and refraction in influencing erosion, transportation and deposition in coastal environments. Be aware that waves can be classified in response to a number of interactive variables: energy, fetch, wind speed and duration, and coastal form. Understand the concept of negative feedback in maintaining equilibrium.</p> <p>Understand the processes of erosion, the factors that affect its rate and features that typically result from it, including bays and headlands, cliffs, stacks and arches, wave-cut platforms and caves.</p> <p>Understand the depositional processes and the resultant features including beaches (swash and drift aligned), dunes, spits, tombolos, bars, barrier islands and salt marshes.</p> <p>Understand the formation and the features of emergent and submergent coastlines, including worldwide changes in sea level (eustatic) and local changes in the continental crust (isostatic).</p>
<b>3.2.3 Issues and management strategies</b> <ul style="list-style-type: none"> <li>• Changes in the use of coastal littorals</li> </ul>	<p>Understand changing land use in coastal zones at a variety of scales and over time.</p> <p>Important changes to be considered are those associated with residential development, tourism, recreation, manufacturing industries and port facilities, including free trade zones.</p> <p>Relate the processes of change to a specific stretch of coast at a local scale.</p>

Content	Learning Outcomes
<ul style="list-style-type: none"> <li>Coastal hazards</li> <li>Response to hazards and environmental impact</li> </ul>	<p>Appreciate that the interaction of terrestrial, atmospheric, marine and biological (including human) factors affect the vulnerability of people to hazards in coastal environments.</p> <p>Understand the hazard of storm surge that results in coastal flooding, especially its impact in LEDCs in tropical and sub-tropical latitudes.</p> <p>Examine a specific example of a coastal hazard and the human responses to it at a local scale. This will include understanding the interaction between economic and environmental factors in coastal management, and considering the possible alternative management strategies.</p>

### 3.3 Arid Environments and their Management

This theme stresses the idea that arid or semi-arid environments are not always remote areas of hazard and hardship. These environments should be seen as a setting for human activity and the range of opportunities and challenges they present should be understood. The theme covers the location of hot, arid environments; the geomorphic processes that operate in them; the landforms that result; and the climate, vegetation and soils of these areas. Central to this theme are the issues that arise from the interaction of people with the arid environment such as desertification, salinization, land-use conflicts and water management. Case studies should be used where appropriate.

Content	Learning Outcomes
<b>3.3.1 The arid environment</b> <ul style="list-style-type: none"> <li>Deficit of moisture as a defining feature</li> <li>Distinction between aridity and infertility</li> </ul>	<p>Define arid areas in terms of the relationship between precipitation, potential evapotranspiration and the soil moisture budget.</p> <p>Be familiar with varieties and locations of deserts, subtropical high pressure areas, rain shadow areas, continental interiors, areas adjacent to cold ocean currents and factors responsible for the formation and location of arid areas.</p> <p>Understand the difference between aridity and infertility of soils in order to understand past, present and potential land use.</p>
<b>3.3.2 Geomorphic processes in the arid environment</b> <ul style="list-style-type: none"> <li>Weathering, erosion and deposition</li> <li>Wind and water processes</li> </ul>	<p>Understand the action of weathering (mechanical and chemical) in producing regolith, and the importance of wind in eroding, transporting and depositing it. Be familiar with deflation and abrasion in erosion, and with suspension, saltation and surface creep in transportation of sediments.</p> <p>Be aware that, while wind (eolian) processes are dominant in some arid regions, water remains the main agent of erosion in arid environments. Be familiar with stream systems in arid regions: exotic or exogenous, endoreic and ephemeral.</p>
<b>3.3.3 Features in the arid landscape</b> <ul style="list-style-type: none"> <li>Distinctive landforms</li> <li>Soil and vegetation</li> </ul>	<p>Understand that processes in arid landscapes are largely the same as in humid environments but they have a very different outcome: a stark and abrupt landscape. Be familiar with landforms resulting from wind processes and from water processes.</p> <p>Recognize features associated with three structures: undisturbed sediments, sediments disturbed by tectonic forces (as in folding and faulting), and eroded igneous masses. These are fundamental to understanding some characteristic terrains including basin-and-range, and mesa-and-scarp.</p> <p>Be aware that soil and vegetation offer easily recognizable evidence of aridity. Understand the character of arid soils and the processes of calcification and salinization.</p>

Content	Learning Outcomes
<p><b>3.3.4 Issues and management strategies</b></p> <ul style="list-style-type: none"> <li>• Desertification</li> <li>• Other land-use issues</li> <li>• Water management and international conflict</li> </ul>	<p>Understand the nature, probable human and natural causes, environmental effects and impacts on humans of desertification.</p> <p>Understand the vulnerability of the LEDCs to desertification through their inability to adopt or afford remedies involving land and water management.</p> <p>Understand the vulnerability of MEDCs to desertification through the mismanagement of land and water issues.</p> <p>Recognize the conflicts arising from mining, tourism and urbanization in arid areas.</p> <p>Understand the competing water needs for urban centres, hydroelectricity, irrigation and recreation.</p> <p>Understand that access to water resources is an increasingly important global issue in arid regions.</p>

### 3.4 Lithospheric Processes and Hazards

This theme provides students with an understanding of the physical causes of land instability including the transfer of energy and materials in tectonic and slope environments within and above the earth's crust. Such physical activity may result in the development of natural hazards. This theme focuses on assessing the level of risk posed to humans by these hazards and the different responses to these hazards. It is essential that the physical processes and human responses are understood through the study of specific examples.

Content	Learning Outcomes
<b>3.4.1 Tectonic processes</b> <ul style="list-style-type: none"> <li>• Plate tectonic theory</li> <li>• Earthquake hazard</li> <li>• Human response to the earthquake hazard</li> <li>• Volcanic hazards</li> <li>• Human response to volcanic hazards</li> </ul>	<p>Understand the internal structure of the earth and the existence and mechanisms of tectonic plate movement. Recognize the different plate margins—destructive, constructive, conservative and collision zones—and the landforms produced by plate movement including volcanoes, rift valleys, fold mountains, ocean ridges, ocean trenches and island arcs.</p> <p>Understand the global distribution of earthquake activity and its association with plate movements and faulting. This involves the study of crustal movement mechanisms and the measurement of earthquake shock and damage using the Richter and Mercalli scales. Assess earthquake impact by analysing primary hazards (shaking ground) and secondary hazards (liquefaction, landslides, tsunamis, floods and fires).</p> <p>Understand that the level of risk posed to humans depends upon the likelihood of earthquake occurrence and a society's vulnerability. Use a comparative study of two specific earthquake events from countries with contrasting levels of economic development. Study the responses to earthquakes. This should include earthquake monitoring, prediction, preparedness and short- and long-term reactions.</p> <p>Relate the distribution and nature of volcanic activity to plate margins and hot spots. Identify the types of eruption and volcanic forms as basic, acid, fissure and composite. Identify primary hazards (such as ash, lava, directed blast, nuée ardente and pyroclastic flows) and secondary hazards (such as landslides, lahars (mudflows) and atmospheric impacts).</p> <p>Understand the variation in response to risk in terms of probability of hazard occurrence and level of economic development, and assess the costs and benefits of living near areas of volcanic activity. Use case studies to look at hazards and to illustrate the benefits including minerals, fertile soils, geothermal power and tourist attractions.</p>

Content	Learning Outcomes
<p><b>3.4.2 Mass movement</b></p> <ul style="list-style-type: none"> <li>• Weathering</li> <li>• Physical causes and consequences of mass movement</li> <li>• Human causes and consequences of mass movement</li> </ul>	<p>Understand the effect of rock type and climate upon the rate, degree and outcomes of chemical, mechanical and biological weathering; and the importance of weathering as a component of mass movement.</p> <p>Understand the concept of slope as an open system with inputs and outputs. Identify different types of movement—fast movements (mudflows, slumping, landslides, avalanches) and slow movements (solifluction and soil creep). Know the processes responsible for these movements, together with the hazards that can arise from them.</p> <p>Recognize and understand human causes of mass movement including deforestation, building on steep gradients, road construction and other activities that cause slope instability. Use a specific case study to illustrate the consequences and responses to a contemporary example of human-induced mass movement.</p>

## 3.5 Ecosystems and Human Activity

The object of this option is to study the interaction and interdependence of abiotic and biotic factors in the development of ecosystems at a variety of scales, with a view to understanding the complexity and vulnerability of these factors. Central to the study is the way that humans need to appreciate these complex relationships in order to understand, utilize, manage or conserve both these natural systems and agro-ecosystems, and to deal with the issues that arise from human–environment interaction.

Content	Learning Outcomes
<b>3.5.1 The concept of the ecosystem</b> <ul style="list-style-type: none"> <li>Terms and definitions</li> </ul>	<p>Define the term ecosystem and be aware of variations in ecosystem scale ranging from micro-scales (niches) to macroscales (biomes). Be able to define ecosystems in terms of inputs, flows, stores and outputs.</p>
<b>3.5.2 The components of an ecosystem</b> <ul style="list-style-type: none"> <li>Biotic components</li> <li>Abiotic components</li> <li>Links between the various components</li> <li>Fragility, vulnerability and resilience of the system</li> </ul>	<p>Demonstrate an awareness of how the biotic (plants, animals, soil, bacteria, fungi) and abiotic (water, air, minerals, nutrients, light) components interrelate to form a natural functioning system, taking into account other contributory factors of acidity, temperature, humidity and wind.</p> <p>Understand the relevant concepts of dynamic equilibrium, food webs and food chains.</p> <p>Demonstrate an awareness of the complexity of links between biotic and abiotic components and how changes to one or more of the components can disturb the equilibrium of the system, especially as a result of human activity. Understand how positive and negative feedback contribute to the stability of the system.</p> <p>Understand that changes to ecosystems may be temporary (where recovery may occur leading to the re-establishment of the system) or permanent, leading to modification of the system.</p>
<b>3.5.3 Processes operative within an ecosystem</b> <ul style="list-style-type: none"> <li>Energy flows</li> <li>Nutrient cycling</li> <li>Plant succession</li> </ul>	<p>Understand how energy enters the system through photosynthesis, how it is transferred from producers (autotrophs) to consumers (herbivores, carnivores and detritovores), and the changes in energy and biomass from one level to the next.</p> <p>Be aware of the major nutrient stores (biomass, litter and soil), the inputs and outputs of nutrients and how nutrients are cycled from one store to another. An understanding of the impact of human activity on nutrient cycling and plant succession is essential.</p> <p>Understand relevant terminology: seres, climatic climax community, sub-climax, primary and secondary succession, and sub-climax vegetation in the removal and replacement of nutrients.</p>



Content	Learning Outcomes
	<p>Study the concepts of invasion, competition and dominance. Develop an understanding of how plants modify the environment, making it possible for more demanding species to survive and more complex communities to develop. A study of one type of plant succession should be included such as a lithosere, hydrosere, psammosere or halosere.</p>
<p><b>3.5.4 Human activity</b></p> <ul style="list-style-type: none"> <li>• Impact of human activity on ecosystems</li> <li>• Human impacts: forestry, farming, pollution</li> <li>• Management and conservation</li> </ul>	<p>Study the impact of human activity on ecosystems in terms of how this activity modifies the structure of the system. Study the processes that operate within the ecosystem in terms of changes in species diversity and number, input flow, output, energy transfer, nutrient cycle, productivity level and sustainability.</p> <p>Study human impacts through detailed case studies of three ecosystems, including at least one forest and one grassland biome. Be familiar with the factors affecting development of the selected biomes such as climatic factors (precipitation, temperature, wind, humidity, light, seasonality, growing season), soil factors (acidity, depth, texture, structure, organic, mineral, water and air content), landscape factors (aspect, slope, altitude) and biotic factors (competition between plants and animals).</p> <p>Study the location, vegetation, fauna and soil type(s) associated with the relevant biome, as well as the climatic background. Understand the nature and intensity of the human impact upon the system, including management and conservation strategies.</p>

## 3.6 Climatic Hazards and Change

This theme gives students an understanding of the physical processes involved in the development of three chosen atmospheric hazards, and the impact of these hazards upon societies at different levels of economic development. The topical issue of climatic change is considered from the viewpoint of human interaction with physical processes at a range of different geographical scales.

Content	Learning Outcomes
<b>3.6.1 Climatic hazards</b> <ul style="list-style-type: none"> <li>Tropical cyclones, hurricanes, typhoons</li> <li>Tropical cyclones: human response</li> <li>Tornadoes</li> <li>Drought</li> </ul>	<p>Recognize the atmospheric processes leading to the development of cyclones, hurricanes and typhoons and the weather conditions associated with them.</p> <p>Understand the location of source areas and the main areas affected by tropical cyclones.</p> <p>Understand the stages of development from beginnings, through maturity to decay.</p> <p>Identify the physical impacts of tropical cyclones (strong winds, heavy rainfall, storm surges and flooding) and the human impacts (loss of life, damage to property and local economies: agriculture, industry, communications and tourism). Identify different types of human response to the hazard (insurance, monitoring, forecasting, precautions, evacuation and reconstruction) and relate these to the level of economic development of the affected area.</p> <p>Be aware of the atmospheric conditions conducive to the formation of tornadoes, their geographical distribution and effects.</p> <p>Identify the physical and human causes of drought and the areas where it is a periodic occurrence. Distinguish between long-term droughts that may affect an area for several years resulting in disastrous human consequences, and short-term dry seasons to which human and natural systems adapt.</p> <p>Be aware that humans can contribute to the causes of drought through deforestation, overgrazing and land mismanagement.</p>
<b>3.6.2 Global climatic change</b> <ul style="list-style-type: none"> <li>Causes of climatic change</li> <li>El Niño Southern Oscillation (ENSO)</li> <li>La Niña</li> <li>Enhanced greenhouse effect</li> </ul>	<p>Understand the causes and effects of the periodic disturbance in oceanic and atmospheric circulation in the Pacific, and how these relate to climatic anomalies resulting in flooding or drought. Be aware of recent El Niño and La Niña events and the areas affected.</p> <p>Be familiar with atmospheric structure and composition and the function of greenhouse gases. Understand human modification of the atmosphere, the reasons for an increase in the production of specific greenhouse gases such as carbon dioxide and methane, and how these gases create the enhanced greenhouse effect. Be aware that natural events such as volcanic eruptions can have a similar effect. Consider the role and possible consequences of the enhanced greenhouse effect in global warming.</p>

Content	Learning Outcomes
<ul style="list-style-type: none"> <li>• Acid deposition</li> <li>• Ozone depletion in the stratosphere</li> </ul>	<p>Understand the physical processes involved in the development of both dry and wet acid deposition, as well as the transnational transfer of acidity and the international response to it.</p> <p>Be aware of the factors responsible for the formation of stratospheric ozone and its depletion by atmospheric pollution and natural causes. Understand the effects of ozone depletion on humans, animals and plants. Study local, national and international responses to ozone depletion.</p>
<p><b>3.6.3 Local climatic change</b></p> <ul style="list-style-type: none"> <li>• Modification of urban micro-climates</li> <li>• Modification of rural micro-climates</li> </ul>	<p>Understand how the climate of urban areas can be altered in terms of atmospheric composition, temperature, humidity, sunshine, precipitation and wind speeds. Understand the formation and effects of photochemical smog and low-level ozone.</p> <p>Understand the micro-climatic changes resulting from human activity in rural areas. Studies should include the effects of deforestation, afforestation, farming practices and dam construction on local micro-climates.</p>

## Part 3: Optional Themes—Section B

The optional themes in this section are:

- 3.7 Contemporary issues in geographical regions
- 3.8 Settlements
- 3.9 Productive activities: aspects of change
- 3.10 Globalization

Higher level students must study at least one of the optional themes in this section.

Standard level students must study any two optional themes, selected from either section A, section B and/or section C.

### 3.7 Contemporary Issues in Geographical Regions

This theme develops the concept of region as a means of understanding contemporary geographical issues. The theme also develops a sense of place as an important concept and one that enables international students to be able to develop “place attachment”. Two regions are to be studied at a local scale. One of the regions studied should be familiar to the student, and would usually be the student’s own local region. The regional approach offers a means of integrating physical and human facets of the environment, as well as providing an avenue to develop skills in map analysis, interpretation of photographic and other remote sensing data, and analysis of numerical, written and graphical data. Development of these skills is a key objective of this theme. This theme gives students the potential to engage in detailed study of their local region, using fieldwork and a variety of maps wherever possible, as well as developing the skill of regional comparison.

The scale of the regions selected (or defined) in this theme is not prescribed. The key criterion is that the extent of the region should extend to the limits of the distinctiveness that defines it. If a region is too small (such as a section of a town), then it will lack the diversity of characteristics necessary to define a region successfully. If the area is too large (such as a continental or sub-continental area like the Sahel or the Steppes), then the volume of information necessary to understand its character will be beyond the grasp of students in the time available. Sometimes one characteristic among the region’s many distinctive factors will be the primary defining characteristic (either because of its importance or because of its cause-and-effect influence). Examples of this would include manufacturing in South Wales (UK), agriculture in the wheat–sheep belt of Australia, political and/or economic factors in Hong Kong SAR of China, and terrain in the Mekong Delta of Vietnam.

Content	Learning Outcomes
3.7.1 The regional concept	<p>Recognize that regions are areas of land with distinctive characteristics that enable them to be distinguished from neighbouring areas. Understand that regions are mental constructs that can be of any size, that each is unique and that they have boundaries that are broad areas of transition.</p> <p>Distinguish types of regions, including single-feature regions (distinctive areas defined on the basis of single features such as landforms, vegetation or land use), functional regions (defined by their combination of economic activities) and multi-feature regions (defined by several characteristics, usually a combination of physical and human, to describe regional character).</p> <p>Appreciate the effect of distance decay from the core to the periphery as a means of defining boundaries as limits of distinctiveness of regions. Be able to delineate single- and multi-feature regions using maps and other data.</p>

Content	Learning Outcomes
<p><b>3.7.2 Case study of a specific place</b></p> <ul style="list-style-type: none"> <li>• Definition of a specific place</li> <li>• Character of the place (developing a sense of place)</li> </ul>	<p>Define what is meant by a geographical place.</p> <p>Use maps, images and other materials to assemble the characteristics of an area (one familiar to the student) and describe the character of the place.</p> <p>Apply the concept of distance decay to define the place.</p> <p>Identify the linkages and relationships with other places and regions.</p> <p>Collect and analyse a variety of geographical data as a means of describing the physical and human traits of a region.</p>
<p><b>3.7.3 Contemporary geographical issues in the local region</b></p>	<p>Analyse a variety of data and gather information from a variety of sources to assess the local region's contemporary geographical issues. Understand the physical, economic and socio-political causes of these issues, together with their possible solutions.</p>
<p><b>3.7.4 Comparative study of a second region</b></p> <ul style="list-style-type: none"> <li>• Definition and description of a region</li> <li>• Contemporary geographical issues in a second region</li> <li>• Regional comparison</li> </ul>	<p>Define and describe a second multi-feature region that is similar in scale to the local region. Follow the methodology outlined above (as far as possible).</p> <p>Analyse a variety of data and gather information from a variety of sources to enable a second region's contemporary geographical issues to be analysed. Understand the physical, economic and socio-political causes of these issues, together with their possible solutions.</p> <p>Compare the characteristics of the two regions in a systematic manner.</p>

## 3.8 Settlements

This theme leads to an understanding of rural and urban environments, their location and characteristics, and the processes responsible for changes over time and space. It is concerned with the social, economic and environmental impacts, and the management implications of these impacts on the landscape.

Content	Learning Outcomes
<b>3.8.1 Rural and urban settlements</b> <ul style="list-style-type: none"> <li>Definition and characteristics</li> </ul>	Describe rural and urban settlements in terms of settlement, site and situation, population size and density, land use, functions, employment and social structure.
<b>3.8.2 Process of urbanization and urban growth</b> <ul style="list-style-type: none"> <li>Definitions and characteristics</li> </ul>	Define urbanization and urban growth, and describe and explain the global patterns of both. Understand the wide variation in levels and rates of urbanization and urban growth between LEDCs and MEDCs.
<b>3.8.3 Theoretical landscapes</b> <ul style="list-style-type: none"> <li>Size and spacing of settlements</li> <li>Fields or spheres of influence</li> <li>Urban land use</li> </ul>	<p>Understand the spatial distribution of settlements (clustering and dispersion). Gain a basic understanding of Christaller's central place model (hierarchy of settlements and size of urban fields) and interpret nearest neighbour index and rank-size rule.</p> <p>Use Reilly's gravity model to determine the field of influence of a central place.</p> <p>Use relevant urban land-use models and bid-rent theory to examine, compare and contrast urban land-use patterns in MEDCs and LEDCs.</p>
<b>3.8.4 Urban morphology</b> <ul style="list-style-type: none"> <li>Central business district (CBD)</li> <li>Residential zones</li> <li>Changing urban land use</li> </ul>	<p>Understand the dynamic nature of the CBD and the concept of functional grouping. Understand the core-frame model and the processes of assimilation and discard.</p> <p>Know how and why residential densities change with regard to distance from the CBD. Understand patterns of social segregation and the process of gentrification.</p> <p>Understand the effect of transport on both planned and spontaneous changes in urban land use. Understand how these result in the decentralization of population and functions (retail, industrial, service), and the reverse process of re-urbanization.</p>

Content	Learning Outcomes
<p><b>3.8.5 Conflicts and management issues</b></p> <ul style="list-style-type: none"> <li>Urban areas</li> <li>The rural–urban fringe</li> </ul>	<p>Appreciate the main problems and conflicts within urban areas in countries with different levels of economic development. This involves the study of selective out- and in-migration, formal and informal enclaves and settlements (inner-city slums, shanty towns, gentrification), unemployment and social deprivation, industrial decline, congestion and pollution.</p> <p>Evaluate the effectiveness of associated management strategies including CBD regeneration, slum clearance, urban renewal and self-help schemes.</p> <p>Examine the growth of commuter settlements within the rural–urban fringe and the reasons for this process of counter-urbanization.</p> <p>Evaluate the positive and negative social and economic impacts on commuter villages.</p> <p>Examine the conflicts arising from the changes in the rural–urban fringe. These might include retail development, traffic congestion and pollution, and competing agricultural, residential, recreational and other land uses.</p>

### 3.9 Productive Activities: Aspects of Change

This theme examines the main changes that affect both the nature and location of productive activities, in particular agriculture and manufacturing. The geographical implications of change in terms of the growth and decline of industrial areas and the changing role of agriculture are examined at a variety of scales. The concept of globalization and sustainability are included as important elements.

Content	Learning Outcomes
<b>3.9.1 Locational factors</b> <ul style="list-style-type: none"> <li>Agricultural location</li> <li>Industrial location</li> </ul>	<p>Understand the factors responsible for the optimal locations for specific farming types (mainly the natural factors of climate, soils, aspect and slope) and of sub-optimal locations (including market, land ownership and government intervention).</p> <p>Understand the general factors that influence industrial location (including raw materials, market, energy, transport, labour, capital, land costs and environmental constraints) and the influence of macro-factors (choice of continent and country), meso-factors (regional location) and micro-factors (choice of site).</p>
<b>3.9.2 Changes in transport and communications</b> <ul style="list-style-type: none"> <li>Transport costs and changes in transport technologies</li> <li>Improved communications</li> </ul>	<p>Understand the declining role of transport costs in determining least-cost locations (as in the Von Thünen and Weber models) and the reasons for the reduction in the “friction of distance” in terms of changing transport technology. Explore the effects of this on speed, bulk transport, cost and accessibility (for local market agriculture and of footloose industries).</p> <p>Appreciate how the role of improved communications, especially electronic, affects the globalization and dispersal of industry.</p>
<b>3.9.3 Changes in labour</b> <ul style="list-style-type: none"> <li>Sectoral shifts and locational changes</li> <li>Mechanization and computerization</li> <li>Female and child labour</li> </ul>	<p>Analyse the sectoral shifts in employment away from farming into manufacturing and the services. Understand the shift of employment in manufacturing in the market economies of the North to the newly industrialized countries (NICs). Understand also the emergence of affluent core areas with high wages and high employment in management, finance and information services, and poorer periphery areas with low wages where the manufacturing occurs.</p> <p>Examine the impact of mechanization and computerization on the demand for, and cost of, labour in both the agricultural and industrial sectors.</p> <p>Understand the role of women and children in agricultural and industrial labour forces, how it varies globally and the importance of the relative labour costs.</p>



Content	Learning Outcomes
<b>3.9.4 Changes in systems and organization</b> <ul style="list-style-type: none"> <li>• Changes in production methods</li> <li>• Agribusiness and multinationals</li> <li>• Government intervention</li> </ul>	<p>Develop an understanding of how agricultural and industrial production can be viewed as a system of inputs, processes and outputs, and how this is changing from labour-intensive to capital-intensive production.</p> <p>Understand the changes in ownership and organization of agricultural and industrial enterprises and the trend towards greater specialization, greater capitalization and international ownership of all the elements of the production process, from the raw resource to the finished product.</p> <p>Understand the role of government in influencing the nature of agricultural production and the location of industrial production.</p>
<b>3.9.5 The geographical impacts of change</b> <ul style="list-style-type: none"> <li>• Agricultural change</li> <li>• Changes in industrial location</li> </ul>	<p>Understand how agricultural production has increased as a result of adopting technological innovation. This will include the use of high yielding varieties (HYVs) of crops and genetically modified (GM) crops; the extension of agricultural land by irrigation; and the social, economic, environmental and political problems that arise (in both LEDCs and MEDCs) from this increase in production.</p> <p>Understand how changes in locational factors cause firms to relocate; the reasons for the decline of traditional manufacturing regions in many MEDCs; the ways government policy and inward investment can regenerate de-industrialized areas or lead to the emergence of new industrial areas; the reasons for the emergence of NICs, their location and their concentration on the production of goods for export; and the emergence of new industrial agglomerations and regions outside the western market economies.</p>
<b>3.9.6 Sustainable development</b> <ul style="list-style-type: none"> <li>• Sustainable agriculture</li> <li>• Sustainable industrialization</li> </ul>	<p>Define and describe sustainable agriculture. Evaluate the need for sustainable agriculture arising from the increased pressure on agricultural land as a consequence of inappropriate farming methods and growing populations.</p> <p>Identify the changes that would occur with the implementation of sustainable agricultural practices.</p> <p>Define sustainable industrialization and describe the changes that would result from implementing policies on resource reduction, pollution controls and the use of appropriate technology.</p>

## 3.10 Globalization

The term globalization is often applied to the spread of economic, social and cultural ideas across the world, and the growing uniformity between different places that results from this spread. The consequence of globalization is a dilution of economic, social and cultural differences between places.

The concept of globalization generates debate at various levels. Some commentators see it as an agent of growing MEDC government and transnational corporate influence, while others go so far as to deny globalization actually occurs. Therefore, the concept is a contestable one.

Traditionally, a major focus of the study of geography has been describing, analysing and explaining the differences between places. As globalization works to reduce these differences, it becomes an important focus for study by geographers.

This theme examines the spatial aspects of globalization. A detailed study of tourism is used to illustrate globalization in practice.

Content	Learning Outcomes
<b>3.10.1 Globalization</b> <ul style="list-style-type: none"> <li>Definitions and characteristics of globalization</li> </ul>	Identify globalization as a process that has important spatial implications because of its impact in economic, cultural and political spheres.
<b>3.10.2 Globalization of economic activity</b> <ul style="list-style-type: none"> <li>Integration of world economic activity</li> <li>The role of global transport</li> </ul>	<p>Understand that world economic activity is increasingly integrated because of growing international trade, the growth of transnational corporations (TNCs), international economic agreements, trading blocs and global movements of capital. Be familiar with the evidence of the growth of each of these global economic integration factors.</p> <p>Understand how changes in transport (air, sea, land) in recent decades have resulted in reduced travel times and cheaper costs, and consequently a growth in travel.</p>
<b>3.10.3 Cultural integration</b> <ul style="list-style-type: none"> <li>Factors affecting cultural integration</li> <li>Effects of cultural integration</li> <li>Impact of cultural integration on an indigenous population</li> </ul>	<p>Recognize that the factors affecting cultural integration include technological change, transnational corporations (TNCs), global media networks, the Internet, tourism, migration and the actions of governments.</p> <p>Recognize that the effects of cultural integration include homogenized landscapes, economic dominance and dependence, threats to cultural diversity and sovereignty, and shrinking time and space.</p> <p>Undertake a detailed investigation of the impact of globalization on the culture of an indigenous population. As a result of this in-depth study, understand the forces leading to changes in this indigenous population and the balance of influences that cause these changes, especially economic, media, tourism, religious and political influences.</p>

Content	Learning Outcomes
<p><b>3.10.4 Tourism</b></p> <ul style="list-style-type: none"> <li>• Growth of global tourism</li> <li>• Recent changes in the tourist industry</li> <li>• Tourism as a development strategy</li> <li>• Sustainable management of tourism</li> </ul>	<p>Recognize the different rates of growth around the world and the way that these are related to both demand and supply. Factors causing growth would be increased mobility, affluence, media coverage, organization of the mass tourist industry by TNCs and infrastructural improvements at destinations particularly in LEDCs. Understand that tourism involves both leisure and work.</p> <p>Appreciate the expansion of tourism towards more exotic and remote destinations. Changes over time should be understood by applying Butler's product cycle model to one tourist area.</p> <p>Understand the growing importance of the tourist industry in several countries. Recognize the economic benefits (including increases in GDP), the multiplier effect and the social benefit of cultural understanding and language learning. Also recognize the following costs of tourism to the destination:</p> <ul style="list-style-type: none"> <li>• economic costs (including leakage of revenue abroad through involvement of TNCs, the seasonal nature of employment and the development of wealthy tourist enclaves and neglected peripheries)</li> <li>• social costs (including the dilution or "McDonaldization" of culture, the breakdown in family values and the growth of crime, alcohol, drugs, prostitution and diseases including AIDS)</li> <li>• environmental costs (including the destruction of local habitats, land, air and water pollution).</li> </ul> <p>Appreciate the concept of sustainability and, with reference to two case studies, understand the management strategies adopted to conserve a tourist destination (including ecotourism).</p> <p>Use a study of Antarctica as an example of how the extension of tourism towards increasingly exotic locations on the global periphery can cause conflicts.</p>

## Part 3: Optional Themes—Section C

The optional theme in this section is:

### 3.11 Topographic mapping

Higher level students can choose to study this optional theme as one of their four optional themes.

Standard level students can choose to study this optional theme as one of their two optional themes selected from either section A, section B and/or section C.

### 3.11 Topographic Mapping

This theme seeks to integrate the human and physical aspects of geography through the use and interpretation of topographic maps, supported by other maps and images. Unlike the other themes, the emphasis in this theme is placed upon developing skills rather than covering content.

Note that the study of either physical or human landscapes should not be taught in isolation. It should be recognized that the physical environment influences human landscapes and, conversely, human activities are increasingly responsible for changes in the biophysical environment.

Content	Learning Outcomes
<b>3.11.1 Components</b> <ul style="list-style-type: none"> <li>• Scale</li> <li>• Location</li> <li>• Relief</li> <li>• Key (or legend)</li> <li>• Imaging</li> </ul>	<p>Be familiar with metric scales as representative of fractions, statements and linear scales. Measure and calculate distance and area.</p> <p>Locate points by grid references (four- and six-figure), latitude and longitude, and orientation by direction and bearings.</p> <p>Depict height and slope (spot heights, triangulation points, contours, layer and hill shading, cliff symbols), determine gradient and intervisibility, and draw sketch profiles.</p> <p>Recognize and interpret map symbols commonly used on maps from different countries.</p> <p>Gain familiarity with satellite images, aerial and oblique photographs.</p>
<b>3.11.2 Spatial patterns</b> <ul style="list-style-type: none"> <li>• Physical landscape</li> <li>• Human landscape</li> </ul>	<p>Recognize and describe landforms and landscapes resulting from fluvial, coastal, glacial, arid and tectonic processes, and from rock type and structure.</p> <p>Recognize and describe drainage patterns.</p> <p>Recognize and describe the distribution and nature of natural vegetation cover.</p> <p>Recognize, describe and explain patterns of land use.</p> <p>Recognize, describe and explain patterns of settlement, including clustering and dispersion.</p> <p>Analyse urban morphology using the spatial distribution of functions and functional zones.</p> <p>Analyse rural settlements by function, size and form.</p>

Content	Learning Outcomes
<ul style="list-style-type: none"><li>• Integration of landscape components</li></ul>	<p>Appreciate the importance of site and situation to both rural and urban settlements.</p> <p>Recognize, describe and explain types and patterns of communications, including street patterns within urban areas.</p> <p>Understand that the physical landscape offers both constraints and opportunities to human activity.</p> <p>Represent the landscape using annotated sketch maps.</p> <p>Synthesize the human and physical components of the landscape, and draw conclusions and inferences.</p>

# ASSESSMENT OUTLINE

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## Higher Level

*For first examinations in 2005*

### External Assessment 75%

#### Written papers 4 hours

##### Paper 1 1 ½ hours 25%

Three questions, based on the core theme.  
Students are required to answer **two** questions.  
The maximum mark for each question is 25.

##### Paper 2 2 ½ hours 50%

Eleven questions on the optional themes.  
Students are required to answer **four** questions.  
The maximum mark for each question is 20.  
Two questions must be answered from section A and one from section B, with the fourth question answered from either section A, section B or section C.

#### Section A

Six questions (one on each theme in section A), each providing a choice between an essay or a structured, data- or stimulus-response question.

#### Section B

Four questions (one on each theme in section B), each providing a choice between an essay or a structured, data- or stimulus-response question.

#### Section C

One structured question (on the theme in section C) based on analysis of a topographic mapping extract.

#### Resource booklet

This booklet contains relevant stimulus and data material for structured questions.

### Internal Assessment 25%

#### Fieldwork

Fieldwork, leading to one written report (2,500 words), is to be internally assessed by the teacher and externally moderated by the IBO.

The fieldwork report should be:

- hypothesis-based
- related to a theme in the syllabus.

# ASSESSMENT OUTLINE

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## Standard Level

*For first examinations in 2005*

### External Assessment 80%

#### Written papers 3 hours

##### Paper 1 1 ½ hours 40%

Three questions, based on the core theme.  
Students are required to answer **two** questions.  
The maximum mark for each question is 25.

##### Paper 2 1 ½ hours 40%

Eleven questions on the optional themes.  
Students are required to answer **two** questions.  
The maximum mark for each question is 20.  
Ten questions (one for each theme in sections A and B) provide a choice between an essay or a structured, data- or stimulus-response question.  
Question eleven is a structured question (from section C) based on analysis of a topographic mapping extract.

#### Resource booklet

This booklet contains relevant stimulus and data material for structured questions.

### Internal Assessment 20%

#### Coursework

One piece of coursework (approximately 1,500 words) is to be internally assessed and externally moderated by the IBO.

The work must be:

- selected from either a fieldwork exercise or a research assignment
- related to a theme in the syllabus.

# ASSESSMENT MODEL

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An integrated approach is required for the study of geography and consequently there may be an overlap of the assessment objectives across the assessment components.

## Higher Level

	Paper 1	Paper 2	Internal assessment
Syllabus content	core theme	optional themes	selected from one theme and hypothesis-based
Method	two structured questions (extended response)	four questions (choice of essay or structured, stimulus response for each theme)	fieldwork with one written report
Component time	1 hour 30 minutes	2 hours 30 minutes	
Assessment weighting	25%	50%	25%

## Standard Level

	Paper 1	Paper 2	Internal assessment
Syllabus content	core theme	optional themes	selected from one theme
Method	two structured questions (extended response)	two questions (choice of essay or structured, stimulus response for each theme)	coursework with one written report based on either fieldwork or research assignments
Component time	1 hour 30 minutes	1 hour 30 minutes	
Assessment weighting	40%	40%	20%



# ASSESSMENT DETAILS

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## General

The method of assessment used by the International Baccalaureate Organization (IBO) is criterion-referenced, not norm-referenced: the method of assessment judges the student's work by their performance in relation to identified assessment criteria and not in relation to the work of other students.

There are two different methods of assessment in Diploma Programme geography: external and internal.

- **External Assessment:** For paper 1 and paper 2 there are detailed markschemes specific to each examination that are published at the end of each examination session.
- **Internal Assessment:** For internal assessment a number of assessment criteria have been identified. Each assessment criterion has markband descriptors describing specific levels of achievement together with the appropriate ranges of marks. The markband descriptors are published in this guide. The descriptors concentrate on positive achievement, although for the lower levels failure to achieve may be included in the description.

## External Assessment

### Higher Level and Standard Level Papers 1 and 2

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<b>Paper 1</b>	<b>(1 ½ hours)</b>	<b>HL 25%</b>
		<b>SL 40%</b>

The purpose of this paper is to assess students' knowledge and understanding of the core theme: population, resources and development. The elements within the topics in this theme are all interrelated and the questions on the paper will require a holistic understanding of the topics and an ability to synthesize the issues (which could cover more than one element). All elements must be studied.

- Three structured questions will be set on the core theme. The questions, normally based on stimulus material, are sub-divided into closely related parts. The first part will test knowledge. Further parts will test understanding, application and analysis/ evaluation of the theme, and will require more extended responses.
- Students are required to answer two questions.
- Each question will be worth 25 marks.
- The marks allocation for each part will be indicated on the paper and this gives students an idea of the depth of response required and how much time should be spent on each part.

<b>Paper 2</b>	<b>(2 ½ hours HL)</b>	<b>HL 50%</b>
	<b>(1 ½ hours SL)</b>	<b>SL 40%</b>

The purpose of this paper is to assess the students' knowledge and understanding of the optional themes. Students will be expected to draw on their knowledge of their chosen optional theme and apply it to the questions.

### Questions

- The paper consists of eleven questions. One will be set on each of the eleven optional themes.
- The paper is divided into three sections (section A, section B and section C), to reflect how the optional themes are presented. There will be six questions in section A and four questions in section B. Within each of the questions in section A and section B there will be a choice between an essay question or a structured, data- or stimulus-response question for each optional theme. There will be one structured question in section C that will be based on analysis of a topographic map extract.
- The essay question will require students to decide what points are relevant and how the material should be arranged. This type of question gives minimum guidance to the student.
- The data/stimulus-response question will be structured and sub-divided into parts. In general, earlier parts of the question will require students to respond to the data and draw conclusions from it, further parts will require a development of ideas and final parts will require a development of ideas in a different, but related, topic within the theme. The wording of each question will indicate the kind of answer required. The data may be written, pictorial or diagrammatic and can include maps, graphs, diagrams, models, tables, satellite images, photographs and short extracts or quotations.
- Higher level students must answer a total of four questions. Two questions must be answered from section A and one from section B, with the fourth question answered from section A, section B or section C.
- Standard level students are required to answer two questions selected from section A, section B or section C.
- Each question will be worth 20 marks. The marks allocation for each part will be indicated on the paper and this gives students an idea of the depth of response required and how much time should be spent on each part.

## Resource booklet

Some data for the stimulus questions in sections A and B and the topographic mapping extract for section C will be presented in a separate resource booklet. Students should be familiar with using such materials.

## Skills

The following skills are assessed in paper 2.

- **Understanding:** Marks are awarded according to the extent to which students can explain the meaning of terms and references in the data or question, and show knowledge of the geographical context and an understanding of the geographical perspectives of the data.
- **Analysis:** Marks are awarded according to the extent to which students can show an understanding of the meaning and significance of data, or the significance of a combination of the geographical perspectives of the data.
- **Application:** Marks are awarded according to the extent to which students can apply or bring geographical knowledge to bear on the data sources, therefore placing the data in a wider context and demonstrating a greater understanding of the data beyond a mere internal analysis.
- **Synthesis:** Marks are awarded according to the extent to which students draw on their own knowledge as well as the material in the data to produce a short essay or an extended response, demonstrating the ability to synthesize relevant knowledge at an appropriate level or depth.
- **Evaluation:** Marks are awarded according to the extent to which students are able to make a judgment, present an argument and can explain the criteria on which the judgment is made.

## Internal Assessment

Internal assessment is an integral part of the geography course and is compulsory for both higher level and standard level students. It enables students to demonstrate the application of their skills and knowledge in geography without the time constraints associated with written examinations.

### Guidance and Authenticity (HL and SL)

The work to be internally assessed must be the student's own work. However, it is not intended that students should decide upon a title and then be left to their own devices. The teacher should play an important role during both the planning stages and while the student is working on the study.

1. It is the responsibility of the teacher to ensure that students are familiar with:
  - the requirements of the type of work internally assessed
  - the marking criteria.
2. Teachers and students will need to discuss the fieldwork at higher level and the nature of coursework at standard level. Students should be encouraged to initiate discussions with the teacher to obtain advice and information, and will not be penalized for seeking advice. However, if a student could not have completed the work without substantial support from the teacher, this should be recorded on the appropriate form in the *Vade Mecum*.
3. Teachers must explain clearly to the students that the work to be assessed must be entirely their own, and that students are required to sign a written declaration to this effect, verified by the teacher, when they submit work for internal assessment.
4. Teachers are required to verify that the work submitted is the student's own. If a teacher is in doubt, authenticity may be checked by discussion with the student on the content of the work and scrutiny of one or more of the following:
  - the student's initial proposal and outline
  - the first draft of the written work
  - the references and data cited
  - the style of writing compared with work known to be that of the student.
5. As part of the learning process, teachers can give advice to students on a first draft of an assignment. This advice should be in terms of the way the assignment could be improved but this draft must not be heavily annotated or edited by the teacher. Constant drafting and redrafting is not allowed and the next version handed to the teacher after this first draft must be the final one.
6. The same piece of work cannot be submitted to meet the requirements of both the internal assessment and the extended essay.

### Fieldwork (HL)

**25%**

#### Introduction

The purpose of the internally assessed fieldwork is to amplify, reinforce and extend the principal geographical concepts and skills taught in class. Fieldwork provides an in-depth study of a situation; adds to knowledge, understanding and awareness of the environment; and is intended to enrich the study of particular themes within the course. In addition, fieldwork helps to foster autonomy, cooperation and self-esteem while developing organization, investigation and presentation skills.

## Requirements

## Written reports

Students should produce one written report of 2,500 words of their investigation. Maps, diagrams, graphs, statistical analyses and other supplementary information (such as the title and contents page and references) are not included in the word limit.

The emphasis of the written report should be analytical. A purely descriptive report should be avoided. The following format guidelines should be followed.

- |   |  |
|---|--|
| 1 | Definition of the overall aims of the investigation  |
| 2 | Statement of hypothesis or hypotheses and brief justification<br>Introduction to the study area (including a map of the research area) |

## Coursework (SL)

20%

### Introduction

The purpose of the internally assessed coursework is to amplify, reinforce and extend the principal geographical concepts and skills taught in class. Coursework provides an in-depth study of a situation and adds to knowledge, understanding and awareness.

### Requirements

Students are required to undertake one investigation related to a theme in the course. This can be either:

- one piece of fieldwork, or
- one research assignment.

#### Fieldwork requirements

- Preparation—hypothesis (hypotheses) formulation
- Data collection—observing, collecting and recording primary data in the field (this may be undertaken in groups)
- Analysis—based on the information collected and the application of scientific logic in testing hypotheses
- Presentation—written report of approximately 1,500 words for which the interpretation, analysis and the final report must be the student's own work.

#### Research assignment requirements

- Preparation—hypothesis formulation or setting the research question
- Data selection—from secondary data
- Analysis—based on the information collected and the application of scientific logic in testing the hypothesis or research question
- Presentation—a written report of 1,500 words for which the interpretation, analysis and the final report must be the student's own work.

### Choice of topics

The choice of topic can be the student's responsibility but guidance from the teacher, especially in the case of fieldwork, is essential. Many types of exercise are possible. The choice depends on the opportunities offered in the local environment (including the school site), the opportunities available on organized field excursions, or on the availability of secondary data.

The investigation must be related to a theme or combination of themes of the prescribed syllabus, for example:

- the modification of microclimate by urban development from theme 3.6.3
- patterns of social segregation in areas in an urban centre from theme 3.8.4
- the environmental impact of tourism on a coastal zone over time, combining theme 3.2.3 and theme 3.10.4
- the environmental impact of tourism on a sand dune ecosystem, combining theme 3.10.4 and theme 3.5.4.

The fieldwork investigation should be designed to be clearly based on one or more hypotheses. The research assignment should be either based on a hypothesis or designed around a research question.

Teachers should ensure that the coursework complies with the requirements and meets the criteria for internal assessment.

## Data collection

### Fieldwork

**Primary research**—The data for investigation must come from the student’s own personal or group observations and measurements, that is, it should be collected in the field. This “primary data” should form the basis of the fieldwork investigation. Fieldwork should provide sufficient data to enable adequate analysis and interpretation.

### Research assignment

**Secondary research**—Secondary research involves gathering data from sources that have already been compiled in written, statistical or mapped forms. This “secondary data” should be selected as the basis of the research investigation.

This data could be drawn from published sources such as United Nations (UN) agencies, non-governmental organizations (NGOs), government publications, statistical yearbooks, telephone directories, censuses, the Internet or CD-Roms. The sources of the data must be acknowledged.

## Written reports

Students should produce *either* one fieldwork written report *or* one research assignment of 1,500 words of their investigation. Maps, diagrams, statistical tables and other supplementary information (such as title page, contents page and references) are not included in the word limit.

The emphasis of the written report should be analytical. A purely descriptive report should be avoided. The following guidelines on format should be followed.

### Fieldwork

- |   |   |
|---|---|
| 1 | Statement of hypothesis and brief justification |
| 2 | Introduction to the study area                  |
| 3 | Methods of data collection                      |
| 4 | Written presentation and analysis of results    |
| 5 | Conclusion and evaluation of results            |
| 6 | References                                      |



## Research assignment

- |   |  |
|---|--|
| 1 | Statement of research question or hypothesis and brief justification |
| 2 | Introduction to the topic  |
| 3 | Sources and types of data selected                                   |
| 4 | Written presentation and analysis of results                         |
| 5 | Conclusion and evaluation of results                                 |
| 6 | References   |

Many students use computers to generate fieldwork reports and research assignments while others produce handwritten reports. Both are acceptable. Maps and diagrams can be hand-drawn or computer generated, provided that the most effective technique is chosen to display the data. Photocopied or downloaded maps are only acceptable if they are a basis for an overlay or used as a base map to which further information is added.

Details on how to present the reports are available in the *Vade Mecum*.

## Time allocation

The time allowed for coursework is included within the 150 hours allocated for the course.

## Internal Assessment Criteria

### Using the Internal Assessment Criteria (HL and SL)

The internal assessment criteria comprise higher level fieldwork criteria and standard level coursework criteria. Teachers should judge the internally assessed work against the assessment criteria.

1. Different assessment criteria are provided for higher level and standard level. For each assessment criterion there are markband descriptors that concentrate on positive achievement.
2. The aim is to find, for each criterion, the descriptor that conveys most adequately the level attained by the student's work using the best-fit model.
3. When assessing a student's work, teachers should read the descriptors for each criterion until they reach a descriptor that most appropriately describes the level of the work being assessed. If a piece of work seems to fall between two descriptors, read both descriptors and choose the one that more appropriately describes the student's work.
4. Where there are two or more marks available within a markband the teacher should award the upper marks if the student's work demonstrates most or all of the qualities described. Teachers should award the lower marks if the student's work demonstrates only some of the qualities described.
5. Only whole numbers should be recorded: partial marks, fractions and decimals are not acceptable.
6. Teachers should not think in terms of a pass/fail boundary but should concentrate on identifying the appropriate descriptor for each criterion.
7. The highest descriptors do not imply faultless performance but should be achievable by a student. Teachers should not hesitate to use the extremes if they are appropriate descriptions of the work being assessed.
8. A student who attains a high level of achievement in relation to one criterion will not necessarily attain high levels of achievement in relation to the others, and vice versa. Teachers should not assume that the overall assessment of the students will produce any particular distribution of scores.
9. It is recommended that the marking criteria and their descriptors be available to students at all times.

## Higher Level Internal Assessment Criteria

There are five internal assessment criteria for fieldwork at higher level.

<b>Criterion A</b>	Aims and hypotheses	5 marks
<b>Criterion B</b>	Methods of data collection	5 marks
<b>Criterion C</b>	Data presentation and processing	5 marks
<b>Criterion D</b>	Interpretation and analysis	10 marks
<b>Criterion E</b>	Conclusion and evaluation	5 marks
<b>Total</b>		<b>30 marks</b>

*The criteria should be applied systematically against the relevant parts of the written report.*

### A Aims and Hypotheses

#### Markband

<b>0</b>	There is no aim nor hypothesis.
<b>1–2</b>	The aim (aims) is neither realistic nor clearly focused. There is a hypothesis (hypotheses) but this is not justified. The locational context and theoretical background provided are limited.
<b>3</b>	The aim (aims) is focused and there is an appropriate hypothesis (hypotheses) with justification. The locational context and theoretical background provided are sound, but the treatment of one may be better than the other.
<b>4–5</b>	The aim (aims) is well focused and there is an appropriate hypothesis (hypotheses) with justification. The locational context and theoretical background are strong and there is a clear link between them.

## **B           Methods of Data Collection**

**Markband**

**0**

**1–2**

**3**

**4–5**

## **C           Data Presentation and Processing**

**Markband**

**0**

**1–2**

**3**

**4–5**

## D Interpretation and Analysis

### Markband

- 0** There is no reference to the aim (aims) and hypothesis (hypotheses) and no discussion.
- 1–2** The description of the findings is very brief with little discussion and with little reference to the aim (aims), the hypothesis (hypotheses) and theory. The report reveals that there is generally little depth of understanding.
- 3–4** There is an attempt to provide an adequate reference to the aim (aims), the hypothesis (hypotheses) and theory. The description of the findings presents a simplistic argument either accepting or rejecting the hypothesis (hypotheses). The report reveals that there is a limited depth of understanding. There is

## Standard Level Internal Assessment Criteria

There are five descriptors for coursework at standard level.

<b>Criterion A</b>	Hypotheses or questions	5 marks
<b>Criterion B*</b>	Methods of data collection	5 marks
<b>Criterion C</b>	Data presentation and processing	5 marks
<b>Criterion D</b>	Interpretation and analysis	10 marks
<b>Criterion E</b>	Conclusion and evaluation	5 marks
<b>Total</b>		30 marks

\* Note there are separate markbands under criterion B for fieldwork and for research assignments.

*The criteria should be applied systematically against the relevant part of the written report for the fieldwork and the research assignment.*

### A Hypotheses or Questions

#### Markband

<b>0</b>	There is no hypothesis or no question.
<b>1–2</b>	The hypothesis (hypotheses) or question is not explained. Description of the locational context is limited.
<b>3</b>	The hypothesis (hypotheses) or question is explained. Description of the locational context is sound.
<b>4–5</b>	The hypothesis (hypotheses) or question is fully and clearly explained and shows a clear understanding of theoretical background. Description of the locational context is strong.

## **B        Methods of Data Collection**

### **Markband**

#### **Fieldwork**

- 0**        There is no primary data.
- 1–2**      There is an inadequate statement of the methods used for the data collection. The methods may be inappropriate; as a result there is very little data and it is generally of an inappropriate type or of poor quality.
- 3**        There is a brief but adequate description of methods used for the data collection and they are generally appropriate to the research. As a result there is an adequate amount of primary data.
- 4–5**      There is a clear description and justification of the methods used for data collection. The methods used are appropriate and accurate, sometimes inspired<sup>1</sup> and produce data of high quality. Where relevant, some knowledge of sampling techniques is evident.

#### **Research assignments**

- 0**        There is no evidence of data collected by the student.
- 1–2**      The data selected may be either inadequate, inappropriate or of poor quality. There is an absence of any justification for the selection of data and no comment on the reliability or validity of the data selected.
- 3**        The data is adequate and relevant with appropriate sources used for data selection. There is limited justification or explanation for the data selected, although there may be some consideration of its reliability or validity.
- 4–5**      The data is good with appropriate, possibly innovative, sources used. There is clear and accurate justification for the data selected and good consideration of its reliability or validity.

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<sup>1</sup> Inspired: something original, not ordinary

## C Data Presentation and Processing

### Markband

- 0** There is no data.
- 1–2** The presentation of data is poor. Illustrations and written text are inadequate. There is an absence of maps or, where these are included, they are limited. Some attempt has been made to process the data but it is inadequate, inaccurate or inappropriate.
- 3** The presentation of data, illustrations and written text is adequate. Maps are included and these are adequate. An appropriate, if limited, range of graphical or statistical techniques is used.
- 4–5** The presentation of data, illustrations and written text is good. Maps are included and are of high quality. There is a wide range of relevant graphical and statistical techniques.

## D Interpretation and Analysis

### Markband

- 0** There is no reference to the hypothesis or question.
- 1–2** The description of the findings is very brief with little discussion and with little reference to the hypothesis (hypotheses) or question. There is generally little depth of understanding.
- 3–4** The report is relevant to the hypothesis (hypotheses) or question. Description of the findings presents a simplistic argument. The report reveals that there is a limited depth of understanding. There is some reference to maps and illustrations.
- 5–6** The report is relevant to the hypothesis (hypotheses) or question. Description of the findings presents a sound argument. The report reveals some depth of understanding in the discussion. There are references to all maps and illustrations used.
- 7–8** The report is relevant to the hypothesis (hypotheses) or question. Description of the findings presents a reasoned and balanced argument. The report reveals a depth of understanding in discussion. Anomalies are noted. There are clear references to all maps and illustrations used.
- 9–10** The report is relevant to the hypothesis (hypotheses) or question. Description of the findings presents a well-reasoned, balanced and critical argument. There is a very clear interpretation of the results. The report reveals a good level of understanding. Attempts are made to explain anomalies in results. There are very clear references to all maps and illustrations used.



## E Conclusion and Evaluation

### Markband

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|------------|---|
| <b>0</b>   | There is no conclusion.   |
| <b>1–2</b> | The conclusion is very basic or inconsistent with the data presented in the report. There may be attempts to provide a summary of results. There is some attempt to evaluate the methods of data collection and processing. |
| <b>3</b>   | The conclusion is adequate and some attempt has been made to evaluate the methods of data collection and processing.  |
| <b>4–5</b> | The conclusion is sound and consistent with the data presented in the report. Methods of data collection and processing have been evaluated clearly. There are some brief recommendations for improvements or extensions.   |





