Scheme of Work

Cambridge International AS & A Level Geography

9696

Cambridge Advanced

CAMBRIDGE International Examinations

Contents

Introduction

Overview

This scheme of work provides ideas about how to construct and deliver a course. The Cambridge International AS and A level Geography syllabus has been broken down into teaching units for each paper with suggested teaching activities and learning resources to use in the classroom.

Recommended prior knowledge
No prior knowledge is essential although some of the concepts will be familiar from prior Cambridge O Level/IGCSE® Geography studies.

Outline
The units within this scheme of work are:

Paper 1 Physical Core
- **Unit 1: Hydrology and fluvial geomorphology**
- **Unit 2: Atmosphere and weather**
- **Unit 3: Rocks and weathering**

Paper 1 Human Core
- **Unit 1: Population**
- **Unit 2: Migration**
- **Unit 3: Settlement dynamics**

Paper 2 Physical Options
- **Unit 1: Tropical environments**
- **Unit 2: Coastal environments**
- **Unit 3: Hazardous environments**
- **Unit 4: Arid and semi-arid environments**

Paper 3 Human Options
- **Unit 1: Production, location and change**
- **Unit 2: Environmental management**
- **Unit 3: Global interdependence**
- **Unit 4: Economic transition**

Teacher support
Teacher Support at http://teachers.cie.org.uk provides secure online teacher support materials with access to specimen and past question papers, mark schemes and other support materials. We offer online and face-to-face training; details of forthcoming training opportunities are posted on the website.

An editable version of this scheme of work is available on Teacher Support. Go to http://teachers.cie.org.uk The scheme of work is in Word doc format and will open in most word processors in most operating systems. If your word processor or operating system cannot open it, you can download Open Office for free at www.openoffice.org

Resources
The up-to-date resource list for this syllabus can be found at www.cie.org.uk

Textbooks:
Nagle, G and Guinness, P *Cambridge International A and AS Level Geography* Hodder Education, 2011 ISBN 9781444123166
Note: This text book is suitable for all units of the scheme of work and is referenced in the Learning resources column of this scheme of work.

Burtenshaw, D *Economy and Development* Philip Allan Updates, 2006
Carr M New *Patterns, Process and Change in Human Geography* Nelson Thornes, 1999
Cook, I Hordern, B McGahan, H Ritson, P *Geography in Focus* Causeway Press, 2000
Dicken, P *Global Shift: Mapping the Changing Contours of the World Economy* Sage Publications, 2010
Digby, B ed. *Global Challenges* Heinemann, 2000
Gillett, M & J *Physical Environment: A Case Study Approach* Hodder and Stoughton, 2003
Guinness, P and Nagle, G *Advanced Geography: Concepts and Cases* Hodder and Stoughton, 1999
Hart C *Geography for AS* Cambridge University Press, 2000
Heelas, R *Tropical Environments: Contrasting Regimes and Challenges* Nelson Thornes, 2001
Hill, M *Advanced Geography Case Studies* Hodder Arnold, 1999
Holmes, D *Ecosystems and Biodiversity* Philip Allan Updates, 2006
Hordern, B. *Rivers & Coasts* Phillip Allan Updates, 2006
Money, DC *Weather and Climate* Nelson, 2000
Nagle, G *Advanced Geography* Oxford University Press, 2000
Nagle, G *Development and Underdevelopment* Nelson, 1999
Nagle, G *Tourism, Leisure and Recreation* Nelson, 1999
O'Hare, G *Soils, Vegetation and Ecosystems* Oliver and Boyd, 1990
O'Hare, G, Sweeney, J, O'Hara, G *The Atmospheric System: Introduction to Meteorology and Climatology* Oliver & Boyd, 1986
Prosser, R *Human Systems* Nelson, 1999
Prosser, R *Leisure, Recreation and Tourism* Collins, 2000
Prosser R, Raw M, Bishop V and Miller G *Landmark AS Geograph*, Collins, 2003

Regan, C *80:20 Development in an Unequal World* 80/20 Educating & Acting for a Better World, 2006
Warburton, P *Atmospheric Processes and Human Influences* Collins, 2001
Warn, S *A2 Geography Unit 4 Global Challenge* Philip Allan Updates, 2006
Waugh, D *Geography: An Integrated Approach* 3rd edition Nelson Thornes, 2000
Widdowson, J; *GCSE Geography in Focus*; Hodder Murray, 2001
Witherick, M *Development, Disparity and Dependence: A Study of the Asian Pacific Region* Nelson Thornes, 1998
Witherick, M, Adams, K *Cities & Urbanisation* Philip Allan Updates, 2006
Woodfield, J *Ecosystems and Human Activity* 2nd edition Collins, 2000

Websites:

www.politicsresources.net/official.htm links to government websites
http://hdr.undp.org/en/ human development reports archive from 1990
http://rainforests.mongabay.com/ rainforest
www.worldmapper.org/ world maps displaying
www.migrationinformation.org/Resources/ migration
www.weather-forecast.com/countries weather
www.physicalgeography.net/ lots of different physical geography resources
http://np.netpublicator.com/netpublication/n04578744/5 urban smart cities
www.censusindia.net/ good census site for a LEDC
www.rgs.org/OurWork/Schools/School+Members+Area/School+Members+Area.htm current news events linked to geography
www.bbc.co.uk/news/world-asia-pacific-12722187 Japanese earthquake/tsunami

See scheme of work units for further, relevant web links.

Paper 1 Physical core – Unit 1: Hydrology and fluvial geomorphology

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	To understand hydrology Knowledge of the global hydrological cycle To understand the distinction between open and closed systems	**Hydrology** **Hydrological cycle** **System** **Open system** **Closed system** **Components: flows/stores/ inputs/outputs**	**TS** To introduce the idea of a system by analogy. Open systems e.g. car, computer, domestic water supply. Closed systems e.g. central heating, air conditioning. The global hydrological cycle – why is it a closed system? **A** Flow diagram - boxes for stores, arrows for flows. Could be completely blank or partially filled in. Same diagram to be filled in by teacher as discussion with class proceeds and they complete their diagrams. Written definition of global hydrological cycle comprising three ideas 1. Closed 2. Water 3. Scale. May or may not contain volumes of water involved. Useful to suggest climatic variation in volumes of water.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Figure 1:1 Page 1 shows the Global Hydrological Cycle
1.1 The drainage basin system **(a) The hydrological cycle** **(b) Components of the drainage basin system**	An open system Appreciate that it is a spatial unit Know its components - flows stores, inputs, outputs Understand the links between the	**Watershed** **Catchment area** **Precipitation** **Interception** **Throughfall** **Stemflow** **Runoff/overland flow** **Discharge** **Infiltration** **Throughflow** **Percolation** **Baseflow**	**TS** Teacher builds up the drainage basin diagram with learners' input. **A** Compile a cross-sectional diagram or flow diagram of a drainage basin. The pictorial version may be easier to appreciate than the flow diagram. Outline of surface, soil, rock, water table could be given or done from scratch. Sun, vegetation, urban areas, water bodies and river channel added. Different colours used for flows, stores inputs and outputs to distinguish them. Learners could be introduced to flow diagram as consolidation. **A** The component groups of flows, stores, inputs and outputs could be coloured. **A** Learners write definitions of the processes.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 1–4 Figure 1.2 Page 1 shows Drainage Basin Hydrological Cycle Figure 1.5 Page 3 shows Factors affecting Infiltration and Surface Run Off

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	components Each component of the system should be developed Remember that the channel is an important store and flow within the basin system Appreciate operation of some of the components e.g. overland flow especially in relation to climatic variations	**Groundwater** **Recharge** **Water tables** **Springs** **Evaporation** **Evapotranspiration** **Gauging station** **Saturated overland flow** **Hortonian or infiltration excess flow**	**A** Learners write an account of the drainage basin system. The concept of discharge needs to be introduced at an early stage. **TS** and **A** Whole group discussion about the details of all the processes at work within the system and factors that influence those processes and the inter-relationships between the processes, e.g. soil moisture affects infiltration capacity, etc. **TS** Introduce the relationship between infiltration capacity and rainfall intensity is significant in producing different reasons for overland flow. If infiltration capacity is greater than rainfall intensity then the stores will fill before overland flow occurs. This situation is typical of humid climates, e.g. UK. This type of overland flow is known as saturated overland flow. If rainfall intensity exceeds infiltration capacity then Hortonian (or infiltration excess flow) flow occurs. The water cannot enter the ground so it runs straight off the surface. This occurs in arid and semi-arid environments where the rain is intense or in areas of impermeable surfaces.	Section 1:1 Activities Pages 3 and 4 **Past papers** June 2010 Question 1 June 2011 Question 6(a)
1.2 Rainfall – discharge relationships within drainage basins	To understand how a drainage basin responds to a given input of rainfall Ability to draw a hydrograph (labelled well) Understand the storm		**TS and A** Begin with a theoretical diagram of the storm hydrograph. Label fully including the axes. Give some data and a graph can be constructed. **A** This could be reinforced by a “living graph” exercise – give learners a basic outline of a hydrograph with a series of explanatory captions which need to be inserted/attached around the diagram. This can be very effective way of promoting discussion of the relative influence of different processes as well as a possible revision exercise. This could then be developed to	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 5–7 Figure 1.9 Page 6 shows a Simple Hydrograph

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	(flood) hydrograph The factors that influence the hydrograph of a river • Understanding of factors • Knowledge of a range of factors • Understanding the inter-relationships between the factors • Knowledge and understanding of land use changes and their effects on inputs, outputs stores, flows in the drainage basin and hydrographs	**Storm hydrograph** **Lag time** **Rising limb** **Falling limb** **Peak** **Baseflow separation line** **Flashy hydrograph** **Attenuated peak** **Land use** **Rainfall duration and intensity** **Drainage density** **Porosity** **Permeability** **Aquifer** **Wilting point** **Field capacity**	look at the effects of different factors. A range of different hydrographs could then be shown as a springboard to discussion about the factors which influence the nature of hydrographs. **Drainage basin characteristics**: size, shape, drainage density, soil moisture, rock type, slope, vegetation, land use. It is worth emphasising that shape is a factor when area is the same. Attenuated response in elongated basins whereas flashy in round ones. Case studies could be effective in illustrating these general principles. **Suggested extension study**: Detailed drainage basin morphometry in terms of bifurcation ratios, etc. (This is not essential as it is not specified in the syllabus.) **TS** Introduce the idea of **permeability**: ability to transmit water and **porosity**: volume of pore space. The two are linked via the connectivity of the pore space. If the pores are interconnected then the rock/soil may be porous and permeable e.g. sandstone. If the pores are tightly packed water holding is possible but transmission is very slow e.g. clay. Optional - Introduce idea of a pervious rock which is one which is permeable via joints and bedding planes. • Clays are porous but not permeable, • sandstones are porous and permeable, • chalk is not as porous as clay and is permeable, • limestone is pervious, but not porous. Analogies can be used like sponges –real and synthetic and sieves. Links to water tables, aeration zone and saturation zone.	Question 2 Section 1:2 Activities Page 6 **Past papers** November 2011 Question 1 November 2009 Question 1 June 2011 Question 6(b)

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	To appreciate annual hydrographs/river regimes		Study a range of annual hydrographs/river regimes to appreciate the impact of climatic variations on discharge, e.g. comparison of Mediterranean, arid, cool temperate, alpine hydrographs can be instructive. The important aspect here is how these factors and combination of factors influence the nature of the response of the river. Therefore they should be studied together with a selection of hydrographs. Develop ideas of how changes in these factors cause different responses and changes to the volumes and nature of the flows. Human activities are a significant factor in influencing hydrographs. It may be useful to include human activities in this section as well in terms of river basin management (**1.4**). Equally, human activities could be considered in that section only, e.g. land use changes such as deforestation, afforestation, pasture to arable farming or vice versa, dam and reservoir building, urbanisation – concrete surfaces are impermeable hence their inability to transmit water therefore increased surface runoff. Make sure learners can develop a full explanation, rather than assuming that it can be assumed that concrete is impermeable. Water abstraction and water quality should be consideration either as part of a relevant case study or in general terms. Depending on the river basin chosen, political factors may be relevant where the river crosses international boundaries.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Figure 1:8 Page 6 Compares River Regimes *Cambridge International A and AS Level Geography*

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
				(Nagle and Guinness) Table 1:3 Page 7 shows Factors affecting Storm Hydrographs
1.3 River channel processes and landforms **The channel as a system**	Dynamic equilibrium • Knowledge and understanding of channel variables • Relationships between the variables Fluvial processes	**Gradient of channel bed** **Load – capacity and competence** **Discharge** **Velocity** **Channel efficiency** **Channel roughness** **Capacity**	**TS** In discussion with the group, the basic ideas and concepts can be introduced. • Revise the concept of a system – inputs outputs, flows, discharge. Idea of moving water because of gradient, therefore energy to carry out work. • Ask what the work would be in a channel. • Introduce idea of dynamic equilibrium with respect to a river channel, e.g. adjustment of channel bed to transport its load. • Suggest that there would be a changing dynamic downstream as a result of a number of aspects of the channel which vary, i.e. variables. • What are they and how may they change downstream? • Discharge. Define and use as a springboard for discussion of cross sectional area which links directly to hydraulic radius via wetted perimeter. Look at two or three comparative diagrams of cross sectional area. Introduce idea of how variable discharge can influence channel efficiency by changing the level of water in the channel. (This idea will be picked up again in relation to landforms like braided channels). • The other variables can be discussed once this has been understood, to form the foundations of the succeeding sections on process and form	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 7–15 Figure 1:11 Page 8 shows Hjulstrom curve Figure 1:14 Page 10 shows Meander Formation Figure 1:16 Page 12 shows Waterfall Formation and also case study of Niagara Falls Figure 1:18 Page 13 shows Floodplains, Levees and Bluffs Figure 1:19 Page 13 shows Deltas

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	Knowledge and Understanding of processes of erosion transportation and deposition • Direction of erosion	**Competence Flows - laminar, turbulent, helicoidal** **Abrasion/corrasion Corrosion/solution Hydraulic action as erosion and transportation Traction Suspension Saltation Entrainment Critical erosion**	• Channel roughness • Gradient • Velocity • Competence • Capacity • Friction/flow characteristics **A** To reinforce all these ideas fieldwork or use of a sand tank would be ideal. However if this is not possible then discussion of measurement in the field in theory can aid understanding, e.g. difficulty of measuring discharge in low / high flow conditions. Use of orange peel and cork versus flow meters in terms of accuracy and practicality. At the outset emphasise that these processes are influenced by the dynamics of the channel, interrelate and produce landforms which will be the next section of the work. Result from the energy possessed by the river. For processes of erosion, most authorities consider that abrasion and corrasion result from the action of the transported load. The load is the tool for erosion. Closest analogy 'like sandpaper'. Assists in undercutting and bank caving. More especially linked to turbulent flow and potholes in river bed. Hydraulic action sheer power of water. Cavitation is the implosion of gas bubbles in turbulent flow causing shock waves and weakening the banks of the channel in particular. Both processes lead to bank caving. Vertical, headward and lateral erosion should be covered, either here, or in connection with landform development. Processes of transportation can be done easily by means of one diagram, which shows traction/bed load, saltation, suspension and solution.	Section 1.3 Activities Page 8, 11, 12 and 15 Geofile 529 Sept 2006 River Channels Fieldwork **Past papers** June 2011 Question 1 June 2011 Question 7(c) November 2011 Question 7 June 2010 Question 7

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
		and deposition velocity **Bed load** **Solute load**		
	Hjulstrom curve – link between process and load		**TS Hjulstrom curve** Begin with a diagram of the graph. Emphasise what it demonstrates via the axes of the graph. Explanation can be done by annotating the graph, highlighting critical erosion and deposition velocities in relation to fraction of the load. Reasons why clay particles need such a high velocity when they are such small particles. Distinguish between entrainment and settling location of these curves on the graph. Entrainment (ability of the river to transport material) is the velocity line between erosion and transportation and the settling velocity marks the division between transportation and deposition. **TS** Use survey maps of Zimbabwe (Victoria Falls) and Port Antonio as teaching tools. Very useful. For meandering channels and floodplain characteristics. Discussion can focus on the contrasts and reasons for the contrasts. Conditions under which each occur, e.g. braided channels found in areas of variable discharge and large loads, whereas gradient variation causes meandering channels.	
	The nature of channels Link between process and form • Straight • Meandering • Braided Landforms	**Floodplain** **Braided channel** **Eyot** **Meander** **Pool** **Riffle** **Flows - laminar, turbulent,**	Description, explanation and an example or examples of these landforms is needed. Annotated diagrams can be a useful way of condensing the material. The floodplain with its assemblage of features can be considered as a section of work. This could be a way of creating the link between the geomorphology and the human impact on the physical environment, i.e. the final section of work in this unit.	

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	Classification according to processes of formation • Erosional forms - waterfalls, gorges • Meander characteristics • Depositional – point bars, floodplains, levées, alluvial fans, deltas	**helicoidal** **River cliff** **Slip-off slope** **Point bar** **Waterfall** **Plunge pool** **Rapids** **Gorge** **Bluff** **Floodplain** **Levée** **Cut-off/ox-bow lake** **Alluvial fan** **Delta**		Geofile 563 Jan 2008 Deltas
1.4 The human impact	Floods • Knowledge of causes of river flooding. (The unit is about fluvial processes so examination questions refer to river flooding as opposed to flooding by the sea.) • Understanding of effects. Floods as a hazard • Prediction	**Bankfull discharge** **Overbankfull discharge** **Recurrence interval** **Hard engineering** **Soft engineering** **Management**	Flood risk, prediction in terms of measurement like recurrence intervals. (Prediction is often given insufficient attention and it may be examined in its own right). Factors such as global warming and climate change could be covered as factors influencing prediction and management. Inadvertent changes versus management strategies, which are part of possible amelioration, could be considered. **TS** A case study would be the obvious way. River basin management and river channel management. There are many well-documented examples other than the Mississippi. The use of local examples is encouraged. **Hard and soft engineering techniques**	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 15–23 Figure 1.29 Page 21 shows Channel Diversions Section 1:4 Activities Pages 17, 18 and 22 http://www.pbs.org/wgbh/nova/flood/deluge.h

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	• Prevention • Amelioration • Management	**strategies – wing dykes, levées, etc.**	General principles of physical geography could be the starting point for instance, increasing channel capacity, decreasing discharge and then how the engineering schemes can achieve these objectives rather than just a catalogue of measures. Perhaps the catalogue can be the starting point and learners are asked what the objective is and then a classification can be drawn up. Emphasise the impact of the human activities upon the physical environment rather than the human activities as ends in themselves, i.e. hydrograph changes, modifications to channel and impact on discharges which then result in floods. The case study could include consideration of human use of, and impact on, floodplains. **Note:** Make sure there is an emphasis in the presentation on channel flow, i.e. volume and velocity. Learners are expected to be able to distinguish between flooding and channel flow and appreciate what flooding is, i.e. over bankfull discharge.	tml (Internet websites will provide up-to-date material on the Three Gorges Dam scheme) **Past paper** November 2009 Question 6(c)

Paper 1 Physical core – Unit 2: Atmosphere and weather

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
2.1 Local energy budgets	A basic appreciation of the vertical structure of the atmosphere An appreciation of the atmosphere as a heat engine To understand that incoming solar radiation must be balanced by outgoing radiation Diurnal spatial and temporal variations in energy budgets Methods of heating Knowledge and understanding of local diurnal energy budgets	**Troposphere** **Tropopause** **Stratosphere** **Energy budget** **Evaporation** **Condensation** **Albedo** **Reflection** **Scattering** **Conduction** **Convection** **Radiation - long wave and short**	**TS** Introduce by a temperature/height diagram to show vertical structure of the atmosphere. **A** Annotate with troposphere, tropopause, stratosphere. Emphasise the troposphere as the region of the weather. Temperature inversion acting as a cap on rising air at the tropopause. Nearly all atmospheric moisture is contained in the troposphere. **TS** Idea that the atmosphere is an engine powered by the sun. Inputs must be balanced by outputs or overall heating/cooling may result. Local energy budgets. Input-output analysis using daytime and night- time energy models. The 'day model' and 'night model' energy budget form the basis of 2.1 and need full discussion and explanation of albedo, the role of clouds as reflectors, scatterers and absorbers of light/heat. Different clouds perform different functions. **Day model** Transfers of heat: evaporation, sensible heat transfer, incoming solar radiation, long wave radiation, surface absorption **Night model**	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 24–30 Figure 2.3 Page 25 shows Local Energy Budget Daytime Figure 2.6 Page 26 shows Night Time Energy Budget Figure 2.8 Page 28 shows Temperature Inversion Section 2:1 Activities Pages 25, 29 and 30 Geofactsheet 167 A Simple Guide to Energy Budgets Geofile 543 April 2007 Albedo and Energy Budgets

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
		wave **Latent heat transfer** **Sensible heat transfer**	Transfers of heat: long wave radiation, sensible heat transfer, heat supply to the surface, condensation, production of dew. Methods of heating. Radiation, conduction, convection. Use analogies with which the learners can readily identify. Radiators, air conditioning, a Bunsen burner flame under a beaker of water, which they may have used in the physics lab., or pan of boiling water. • Distinguish between latent heat and sensible heat transfers. **Latent heat –** involves phase change e.g. gas to liquid. Energy is "stored" or "released". **Sensible heat –** energy gain or loss without a phase change. Water vapour does not undergo a phase change. This section of work can be kept fairly straightforward if the daytime and night-time budgets are used. Need not occupy too many lessons. **A** Consolidate by asking questions based on one or both of the diagrams. 1. Draw a fully labelled diagram to show the 'day model' of radiation balance in the earth's energy budget. 2. Describe and explain the effect of cloud cover on the earth's heat energy budget. 3. Leave some energy transfers blank. Learners have to fill them in and then describe two ways in which the local energy budget might be different at night. **These questions test knowledge and understanding.**	**Past paper** November 2011 Question 8(b)
2.2 The global energy budget	Weather phenomena associated with local energy budgets	**Mist, fog, dew, temperature inversions**	**TS** Introduce the simple idea of energy surplus and deficit. High temperatures at the equator and low temperatures at the poles. This can be demonstrated by giving learners a map of average annual distribution of insolation received. By shading areas of less	*Cambridge International A and AS Level Geography* (Nagle and Guinness)

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	• Understanding of the global energy budget • Reasons for differential heating on a global scale, i.e. why is it hot at the equator and cold at the poles? • Global pattern of pressure and winds • Understanding that temperature variations produce pressure and winds	**Hadley cell** **Ferrel cell** **Atmospheric circulation** **ITCZ** **High pressure** **Low pressure** **Coriolis force** **Pressure gradient force** **Geostrophic force** **Ferrel's Law** **Trade winds** **Doldrums** **Polar front** **Jet stream** **Rossby waves** **Upper westerlies**	than 150W/m^2 in one colour and over 225W/m^2 in another, it raises several points for discussion, e.g. low values over equator due to high amounts of cloud cover. Differing temperature patterns produce differential atmospheric pressure. How are the differences balanced? Air movement – winds (and ocean currents). Leads into discussion of the general circulation of the atmosphere. • Discuss the tri-cellular model of the general circulation of the atmosphere • Discuss details of the model • Learners should know and understand something of the three cells, know which are thermally direct and which thermally indirect and why. • Learners should be able to map the world wind belts (which will include the pressure belts too, probably). • Learners should understand how the model helps to explain the pattern of winds. Therefore it is necessary to know about the forces which act on the air, the Coriolis and pressure gradient forces and the resolution of those forces. Influence of the rotation of the earth and deflection of air. Relationship between temperature and vertical and horizontal air movement, i.e. high pressure is subsiding air and low pressure is rising air. • Introduce the idea that general circulation involves upper air movement as well as surface wind. Some explanation and clarification of these upper air movements in simple terms may be required. **A** General circulation diagram can be drawn and annotated. Testing of understanding can be done using questions and partly completed diagrams for the learner to fill in. • Introduce idea of effect of circulation on global distribution of	Pages 31–39 Figure 2.12 Page 31 shows Earth's Energy Budget Figure 2.19 Page 36 shows Ocean Conveyor Belt Figure 2.21 Page 38 shows Coriolis Force Figure 2.23 Page 39 shows Rosby Waves Section 2:2 Activities Pages 34, 37, 35 and 39 Useful satellite photographs www.metoffice.gov.uk Geofile 552 Anticyclones **Past papers** June 2011 Question 8(b) November 2011 Question 2 June 2010 Question

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	Manifestation of the general circulation in the form of world maps of sea level temperature and pressure Knowledge and understanding of the factors that influence local variation within the global pattern		surface temperature and pressure probably using maps. • Use a world map to show the distribution of isotherms for summer and winter, i.e. January and July. • Use a world map to show the distribution of isobars for summer and winter, i.e. January and July. • Learners write a description emphasising patterns and anomalies. Learners can pick out similarities and differences across the globe. • Learners give an explanation of pattern. Factors: latitude/seasons and day and night. Highlight anomalies by relating back to the general circulation. Some of the reasons may not be accounted for on a global scale therefore this is the link into the next section of work on micro/local scale variations. **A** An exercise to consolidate – analysis of satellite photographs. **TS** Explanation of models as simplifications of reality. Leads into local variations. Factors influencing these local changes. • **Ocean currents** – influence of cold and warm currents on temperatures and wind patterns in coastal locations across the globe. Learners will need a map of ocean currents with names, direction of flow and characteristics. • **Proximity to the sea** – specific heat capacity of water compared with land surfaces. Relate to temperature and pressure patterns and anomalies. • **Altitude** • **Aspect** • **Length of day and night and seasons** • **Cloud cover** • **Prevailing winds**	8(b)

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
2.3 Weather processes and phenomena	To understand phase change To understand adiabatic temperature change and relationship between actual air temperature and that of rising air The link between air mass stability and weather conditions	**Fohn wind** **Orographic rainfall** **Rain shadow** **Katabatic wind** **Anabatic wind** **Water vapour** **Humidity** **Evaporation** **Condensation** **Sublimation** **Deposition** **Adiabatic cooling** **Adiabatic lapse rate (ALR)** **Environmental lapse rate (ELR)** **Dew point temperature** **Condensation level** **DALR** **SALR** **Stability** **Instability**	**Meso scale winds** • **Föhn/Chinook winds** link to orographic rainfall and rain shadow areas. **Micro scale winds** • **Land and sea breezes** **TS** Well annotated diagrams may suffice or diagrams with paragraphs of explanation of processes responsible for formation. **TS** Introduce diagram to show phase changes of water in the atmosphere – description and definitions. Explanation of ways in which phase changes can occur: • Temperature change • Increase amount of water vapour • Introduce idea of relative humidity and absolute humidity Ways in which cooling can occur: radiation/adiabatic, conduction, convection Explanation of adiabatic changes as a fundamental principle. Air mass stability – introduced using diagrams. Well annotated, fully labelled diagrams are a good way of describing the conditions and a springboard for explanation. Explain DALR and SALR – the rates and reasons for the different rates. Relationship between ELRs and ALRs. **A** Give two or three different ELRs to be plotted on graph paper and then ask the learners to plot the adiabatic lapse rates. Need to give dew point temperature /condensation level. They can then draw conclusions about the stability of each air mass. Once understanding of stability and instability is secure, include	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 40–48 Figure 2.27 Page 42 shows the Fohn Effect Figure 2.32 Page 45 shows Types of Precipitation Section 2:3 Activities Pages 42, 45 and 48 Satellite photos of all areas of the world as well as local and regional weather information: www.metoffice.gov.uk/ **Past papers** June 2011 Question 8(a) November 2011 Question 8(a) June 2010 Question 2

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	How these changes produce weather phenomena like dew, etc.	**Conditional instability** **Condensation/ hygroscopic nuclei**	conditional instability. **A** One exercise which can be used to test understanding is to give a diagram of a situation of **orographic uplift,** with labels to be attached at appropriate points to explain why differences in temperature and humidity occur on opposite sides of a hill/mountain. This is also a useful reinforcement/revision exercise for explaining orographic uplift mechanisms. **TS** Some general thoughts on points to include for comprehensive coverage of this unit: Introduce weather phenomena. This can be done by association with each air mass type or by dealing with forms of precipitation and including cloud formation. The way in which this is approached is largely personal preference. Description, explanation – should be linked to conditions in which they can be found. Use diagrams where possible and include as much detail as is realistic in the time available, e.g. distinction between advection and radiation fogs. **Rainfall** A brief coverage of Bergeron-Findeisen and coalescence theories. Types – frontal, orographic and convectional rainfall are easily incorporated with air mass stability. Distinguish between winter and summer stability and associated weather conditions. Cloud type related to air mass stability. Anticyclones.	

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
		Anticyclonic conditions **Hoar frost** **Rime** **Dew** **Advection/ radiation fog** **Rain** **Hail** **Snow**		
2.4 The human impact	Wider context of the whole unit –concerns local and global energy budgets. It is divided into two sections: **Greenhouse effect** – local and global **Urban microclimates** • Understand the	**Clouds** **Temperature inversions** **Greenhouse effect** **Greenhouse gases** **Climatic change – global warming /cooling** **Atlantic conveyor** **El Niño/La Niña** **Specific heat capacity**	**TS** This unit could be introduced using energy budgets – global and local to link the two parts together and to link back to other parts of the unit and the atmosphere as a system. **Greenhouse effect** Causes – natural gases in the atmosphere. Identify these and the consequence of their presence – emphasise that it is a natural process. What would happen without it? Discuss how and why human activity has had an impact. Diagrams are useful. It may be necessary/essential to put the ozone layer in context here because there is often confusion between the greenhouse effect and ozone depletion. Relate the greenhouse effect to possible global warming/cooling. A section on climatic change is necessary.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 45–54 Figure 2.38 Page 48 shows The Greenhouse Effect Figure 2.43 Page 52 shows Processes in an Urban Heat Island

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	greenhouse effect both natural and man-made • Causes and consequences of the greenhouse effect • Urban microclimates – knowledge of characteristics, understanding of causes and consequences. Relationships between the individual weather conditions, e.g. temperature, wind speed and humidity	**Albedo** **Urban heat island** **Anomalies**	**A** Consequences of global warming should be discussed – it is important that learners appreciate that the issue is a matter of conjecture and that the consequences may be far-reaching but not certain. **TS** Introduce general principles – starting with the concept of the heat island and using this as a springboard for the other phenomena. Inter-relationships between temperature, wind speed, humidity, precipitation and pollution should be emphasised. **A** Using a case study would be ideal e.g. London, Los Angeles, which are well documented in the textbooks. However, it is worth noting that urban microclimates vary according to urban areas' size, shape and location. These factors can be built into study, e.g. Tokyo, Mexico City and Chicago may exhibit different characteristics because of their particular sites. Distortions of pattern within the urban area are also worthy of consideration, e.g. effects of the River Thames and Lea Valley in London. **Note:** It is important to appreciate the comparison between rural and urban microclimates. Relative climatic data and an assessment and comparison between day and night would be particularly useful.	Figure 2.4 Page 54 shows Change in Climate Caused by Urbanisation Section 2:4 Activities Pages 51 and 54 Geofile 567 January 2008 Forest Microclimates **Past papers** June 2011 Question 8(c) November 2011 Question 8(c) June 2010 Question 8(c) June 2008 Question 7(c)

Paper 1 Physical core –Unit 3: Rocks and weathering

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
3.1 Elementary plate tectonics	Knowledge of global distribution of lithospheric plates Knowledge of different types of plate boundary Knowledge and understanding of the processes and landforms associated with each type of boundary	**Crust, mantle, core** **Lithosphere** **Asthenosphere** **Divergent/ constructive margins** **Convergent/ destructive margins** **Convection currents** **Ridge push** **Slab pull** **Sea floor spreading** **Island arcs** **Subduction zones** **Ocean trenches** **Benioff zones** **Transform faults** **Seismic activity**	**TS** Begin with basic structure of the earth. Then a map of global distribution of plates –describe – linear on continental margins/coastal, i.e. not random or scattered. The map could be annotated. Emphasise the idea of *pattern* globally. **Define a tectonic plate** – key points: – it is a slab of lithosphere – it moves **Explain reasons for movement** – convection currents in the mantle. Brief reference to evidence that plate movement has occurred in the past – use of atlas maps, especially the S. America /Africa "fit". (Be careful not to launch into a long discussion about 'continental drift'). **TS** Consider each plate boundary and describe and explain processes. Consider landforms associated with each type of boundary/margin. Diagrams are the best way of keeping the material manageable and easy to understand. Learners should see how the two major types of margin are complementary, i.e. ridge push and slab pull balance each other out, so that the crust does not become progressively larger. Idea of a system once more. Rates of movement equivalent to the growth of a finger nail.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 55–62 Figure 3.1 Page 55 shows the Earth's Interior Figure 3.4 Page 57 shows Plate Boundaries Figure 3.5 Page 58 shows Types of Plate Boundaries Figure 3.6 Page 59 shows Sea Floor Spreading Section 3:1 Activities Pages 58, 59, 60 and 61 Geofile 554 Plate Boundaries Himalayas and Pacific USA.

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
		Volcanic activity **Shallow/deep focus earthquakes** **Fold mountains** **Mid-ocean ridges** **Conservative margins** **Collision zones**	This part of the unit could, and probably should, be illustrated by reference to specific plate boundaries. e.g. Nazca-South American plate, mid-Atlantic ridge, Pacific-Eurasian-Philippine (island arcs/trenches). San Andreas Fault. Although not specified, conservative margins and collision zones can be useful additions to this section.	Geofile 526 Sept 2006 Hot spots in Plate Tectonics **Past papers** June 2011 Question 9(c) November 2011 Question 9(b) June 2010 Question 9(c) November 2010 Question 3
3.2 Weathering and rocks	Knowledge and understanding of major physical and chemical weathering processes	**Freeze-thaw action/Frost shattering** **Exfoliation** **Wetting/drying** **Spheroidal weathering** **Dilatation** **Salt crystallisation** **Hydration** **Hydrolysis** **Carbonation** **Solution** **Oxidation**	**TS** Introduce the classification of weathering processes. Define weathering – 'breakdown of rocks in situ (where they are)'. Emphasise the idea that no transport is involved and the importance of moisture being present. You can go on to develop the idea of erosion and then denudation so that learners see the processes in context. Use annotated diagrams where possible. Photographs can help hugely in explaining how the processes operate. Photographs from past question papers can be a useful tool. **A** Can be reinforced by a matching exercise – process and description – a simple but often effective means of generating discussion and encouraging thought about the processes, especially when produced on slips of paper which can be physically rearranged and classified into sets representing physical/chemical/weathering/erosion. Discuss whether biological agents justify a separate category of	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 63–69 Figure 3:12 Page 65 shows Peltier's Diagram Section 3:2 Activities Pages 64, 66, 68 and 69 **Past papers** June 2011 Question 9(a) and (b)

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	Appreciation of the role of biological agents in weathering processes Related end products of the processes Knowledge and understanding of the factors which influence weathering processes A detailed appreciation of the role of climate as a factor	**Chelation** **Humic acid** **Effects of acid rain** **Granular disintegration** **Block disintegration** **Joints**	weathering or whether these agents carry out physical/chemical processes, e.g. tree roots, humic acids, organisms, etc. You can introduce the human impact here and discuss increased carbonation – solution on buildings, etc. to cover part of 3.4. The end products should be linked. (This is important and is often forgotten by learners). Therefore physical weathering tends to produce block disintegration, and chemical weathering, granular disintegration. **TS** Introduce the ways in which factors such as climate, vegetation, soils, rock lithology, relief and time may influence weathering processes. Fundamentally, climate and rock lithology are the two key factors. Climate plays an overarching role because it influences other factors like vegetation and soils. **A** Peltier diagram should form the basis for class discussion and then questions can be set on it. Can be annotated with processes. Learners are not required to be able to draw it from memory. Latitudinal variation of regolith depth illustrates role of climate in weathering processes and can be related to the areas on the Peltier diagram. **TS** Introduce the characteristics of granite and limestone. Processes that influence them. Granite – hydrolysis, limestone – carbonation and solution. Introduction of the idea of contrasts between weathering in the tropics and temperate latitudes could be included as a preparation for Paper 2 Tropical environments option, if this is to be studied. However it is not essential for this unit.	November 2011 Question 3 June 2010 Question 9(a) and (b) November 2010 Question 9(a) and (c)

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	Properties of two rocks – granite and limestone Resultant landforms are not required here, see Paper 2 Tropical environments for them.	**Bedding planes** **Composition** **Structure**	Impact of human activity in areas like the Yorkshire Dales, UK would provide material for the human impact on weathering and mass movement here. Footpath erosion, removal of clints from limestone pavements for landscape gardening, may be useful additions for 3.4.	
3.3 **Slope processes and development**	To understand that slopes are systems • Knowledge of slope form • Understanding of mass movement • Knowledge and understanding of processes of mass movement • Understanding of the relationship	**Internal strength** **Shear stress** **Boulder controlled slopes** **Concave slope** **Convex slope** **Free face** **Heave** **Flow** **Fall** **Slide**	**TS** Introduce using a diagram of the slope as a system with inputs and outputs. Consequent form is dynamic, as the result of processes. Look at relationship between internal strength and external forces producing shear stress. If stress greater than strength, then movement occurs. Critical angle of rest for different particle sizes/shapes. Result and slope form. Definition of mass movement: 'Movement of material downslope under the influence of gravity'. There is no other agent of movement, but slope wash and/or the presence of soil water may assist the process. Understanding of the role of water.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 70–78 This includes case studies on Pages 75, 76, 77 and 78 Figure 3.24 Page 73 shows Soil Creep Figure 3.26 Page 74

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	between process and form • Knowledge and understanding of the factors that influence slope processes	**slump** **Soil creep** **Landslide** **Mudslide** **Avalanche** **Rotational slip** **Debris slide** **Debris avalanche**	**Classification of slope processes** A triangular diagram is the best way of discussing the variety of processes. Conditions for each type of process. **A** Learners can plot some of the processes for themselves to demonstrate their understanding. Learners need to learn about each of the major processes and be aware of the resultant slope forms. E.g. rotational slip may be a slide along a slip plane with a flow at the toe if there is clay at the base of the slope. So there will be a compound slope profile possible with concave and convex elements. *Note:* ***It is important that learners realise that differences in slope processes produce differences in slope form, i.e.angle/gradient, shape, characteristics. The factors are similar to those that influence weathering – climate, soil, vegetation, rock lithology especially mixed lithology (e.g. chalk overlying clay). Introduce gradient (influences the shear stress) and aspect. Should be seen as part of the slope as an open system.*** Learners should understand the role of climate in influencing rates of weathering. This is usually little appreciated by learners. Emphasise and study this part of the topic.	shows Falls Figure 3:27 Page 75 shows Slides Figures 3.30 and 3.31 Page 76 shows Slumps and Flows Section 3: 3 Activities Pages 71 and 72 Geofile Jan 2008 Hillslope Hydrology **Past papers** June 2011 Question 3 November 2011 Question 9(a) June 2010 Question 3 November 2010 Question 9(b)
3.4 The human impact	Understanding that human activity may have a significant impact on weathering and slope processes		Human activities which affect weathering and slope processes may be: • **intentiona**l (e.g. mining, quarrying, spoil heaps, stabilising slopes, coastal management) • **unintentiona**l (e.g. effects of acid rain, deforestation, overgrazing by animals, landslides where favelas have been built on steep slopes)	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 78–86 Section 3:4 Activities

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
			Impacts may be positive, i.e. prevent movement, or negative and reduce internal strength/increase external stress. Examples are available in many textbooks, but the use of local examples is encouraged. They are often much easier for learners to understand, remember and use.	Pages 79, 82 and 86 **Past paper** November 2011 Question 9(c)

Paper 1 Human core – Unit 1: Population

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
1.1 Natural increase as a component of population change	Population distribution and density	**Distribution across an area** **Density of population**	Distinguish between these two definitions. Essential to an understanding of overpopulation and underpopulation. They are fundamental to an understanding of spatial distributions. Global distribution showing densities is the ideal starting point. Aerial photos of people sitting on a beach can be a useful teaching aid – people are rarely evenly distributed. Also introduces choropleth maps as a technique. Could also show topological map of the data.	
	Knowledge and understanding of natural increase and natural decrease of population and how this leads to population change To understand replacement level to maintain populations	**Crude birth rate** **Crude death rate** **Fertility rate** **Mortality rate** **Natural increase** **Population change** **Migration** **Replacement level**	**TS** Introduce basic terminology: birth rate, death rate, mortality rates, fertility rates and replacement level. Introduce the idea of overall population growth/decline through the equation. **Pop change = Natural increase/decrease +/- migration** Spatial distribution of population growth rates, i.e. global distribution. Look at statistics to compare growth rates for different countries and groups of countries, e.g. more economically developed countries (MEDCs) and less economically developed countries (LEDCs). **A** This could be an opportunity for learners to practise interpretation of choropleth maps. Explanation of birth rates and death rates. Emphasise the role of factors and the ways in which they may change over time. **Note:** Gender is also an important part of the population change	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 87–92 Geofactsheet 175 Global Population Trends to 2050 Population Bomb or Birth of Death? Table 1.2 Page 89 Figure 1.6 Page 90 Geofactsheet 562 Jan 2008 Population: US Update

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	Factors that influence birth rate and death rate Economic, social environmental and political factors (a long list). Ideally they should be supported by facts, countries and data, to illustrate and exemplify Knowledge and understanding of contrasting population structures	**Age/sex pyramid** **Infant mortality rate** **Life expectancy** **Dependency ratio** **Age-specific birth rate/death rate** **Cohort**	argument. Contrast population decline in Scandinavia and Continental Europe with rapid increase of population in some LEDCs. **Structure of population** **TS Population pyramids** Description – Compare two basic shapes: the wide based-steep sided, low, narrow topped pyramid of LEDCs and the wider based, straight sided, higher, wider topped pyramid of MEDCs. Could also consider rural and urban pyramids and regional variations, e.g. South coast of England with an ageing population is narrow-based and relatively wide at the top. Annotate with explanation and discuss the characteristics showing higher pyramid = longer life expectancies. Consider a range of different age/sex pyramids which have particular characteristics, for instance illustrating the following factors: influence of wars, baby booms, HIV/AIDS, etc. e.g. France, UK, and countries in Africa. Also stage of technological development will link to the demographic transition model (DTM). **Note:** Remember to include migration as part of the reasoning.	Section 1.1 Activities Page 89,91 and 93 **Past papers** Nov 2011 Question 4(a) and (b) Nov 2010 Question 4(a) and (b) *Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 93-96 Figure 1.12 Page 93 shows contrasting pyramid shapes. Figure 1.13 page 94 shows an annotated pyramid. Geofile 500 Sept 2005 Demographic Change and Population Policy in India and China: The International Data

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
				Base of the US Census Bureau is an excellent resource: www.census.gov/ipc/www/idb Geofactsheet Contemporary Population Issues: 3 Case Studies: China, Italy and India Section 1:1 Activities Page 95 **Past papers** June 2010 Question 4(a) Nov 2010 Question 10(a) and (b)
1.2 Demographic transition	Historical growth of population	**Demographic transition**	**Historical perspective – the demographic transition** A model to show the stages in population growth over time. **TS** Annotated diagram can be the best way to approach the model. **A** Learners should draw it for themselves. It concentrates their minds and engages them directly with the material. Pyramids to illustrate each stage plus examples of countries in each stage. Emphasise the fact that it is a model and a simplification of reality. Application to contrasting countries, e.g. the UK and China.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 96–104 Section 1:2 Activities Page 98 and 100 Figure 1.15 Page 96 shows Demographic Transition Model

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
		Ageing populations	Consider the usefulness and limitations of the model. (This critical appraisal is important.) Take into consideration application to cities as well as countries and remember that the model does not have migration built in. 1. Compare population pyramids for each stage of the model 2. Consider different methods of depicting the transition Links to development should be considered throughout. *Relationship to population change should be borne in mind throughout the teaching of this unit and mentioned frequently.* Stage 5 of the model. Discuss with reference to specific countries. This may be inserted wherever it is felt appropriate. **TS** and **A** Debate/discussion ideal on the subject of ageing populations. Suggested title: Ageing population: a blessing or a problem? **Prediction of ageing populations** Discussion about limited value of prediction.	**Past papers** June 2010 Question 4(b) November 2010 Question 4(c) June 2009 Question 3 Case Study of Ageing Population in Japan Page 10 Geofactsheet 196 –

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
				The Globalisation of Ageing
1.3 Population-resource relationships	Appreciation of a debate between the pessimists and the optimists, or ecologists versus economists Knowledge and understanding of basic concepts relating population to resources To understand sustainability	**Carrying capacity** **Population ceiling** **Population boom and crash** **Famine** **Constraints, e.g. war, hazards** **Overpopulation** **Underpopulation** **Optimum population** **Sustainability** **Carrying capacity** **Food shortage** **Subsistence farming** **Appropriate technology**	**Malthusian theory** Using a series of diagrams. By increasing the population level it can be seen that resources are exceeded. Consider Paul Simon's view (economist and optimist) and that of Paul Ehrlich (environmentalist and pessimist) Lead into a discussion of consequences of rapid uncontrolled population increase. Limitations of the theory. **Solutions** • Manage population growth • Increase production – land under cultivation, yield per hectare Introduce Boserup's more optimistic model of changing technology. Look at a graph of population in relation to GDP per person to ascertain concepts of over-, under- and optimum population. **TS** It is important that case study material is geared to the control of growth and the management of the results of change as stated in the syllabus. It is also important to understand that these are relative concepts; discovery of new resources/technology could relieve overpopulation whilst maintaining the same absolute numbers, but the quality of life would improve. Look at relationship between population growth and growth of food production. Compare arithmetic increase of food production	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 105–113 Section 1:3 Activities Pages 110,111 and 113 Figure 1.40 Page 112 compares views **Past papers** June 2008 Question 9 November 2009 Question 10

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
		Intermediate technology **Desertification** **Pollution** **Quality of life** **Green Revolution** **Ecological footprints**	with geometric increase of population (Malthus). Introduce idea of carrying capacity of land in relation to its population.	Case studies of Bangladesh – overpopulation and Canada – underpopulation. Use other local examples if more suitable.
1.4 **The management of natural increase**	A case study of any one country, may be an LEDC or an MEDC. Appreciation of population change within chosen country Difficulties and management solutions		History of population growth and change. Substantiate with population data. Study population structure birth rate and death rate. Life expectancies. Analysis of change over time and discussion of reasons. **Note:** Death rate is a vital component of population change and is often forgotten by learners when discussing management/policies for controlling population growth i.e. managing natural increase. **Population policies** e.g. China 'one child' policy, Singapore, Russia, Germany, UK, Italy or home country. **Consequences**: especially discussion of success and/or failure e.g. gender imbalance, ageing, rural/urban migration. The controls, the changes and then how the country has managed the changes.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 114–118 gives a case study of China. Section 1:4 Activities Page 118 **Past papers** June 2009 Question 9(c) June 2008 Question 10

Paper 1 Human core – Unit 2: Migration

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
2.1 Migration as a component of population change	Knowledge of the meaning of migration	**Migration** **Push factors** **Pull factors** **Constraints** **Intervening obstacles** **Barriers**	**Definition of migration** to exclude all movements of less than one year, e.g. holidays and commuting (correctly termed circulation, rather than migration). Migration should involve a more or less permanent change of residence. **TS Patterns of migration** global, continental, national scales. Good introduction by using a world map. **A** Learners describe the patterns and then attempt to explain them. **Causes:** Physical (environmental), social, economic, political and historical factors influencing migration. Out of that discussion a need for classification may evolve. Challenge the learners to think of reasons for the global patterns of migration and then see if they can suggest some reasons. Often it is a good idea to set some preparatory reading so that they have the foundations on which to build in the lesson. **Causes:** Economic, social, environmental and political reasons. **Impacts** on both receiving and source regions. Emphasise links with population structure and Unit 1 Population.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 119–126. Pages 124 and 125 provide a case study of Brazil Figure 2.2 and 2.3 Page 120 shows push and pull factors
2.2 Internal migration	Appreciation of movement within, as	**Rural-urban** **Urban-rural**	**Processes of migration** Different ways in which people migrate.	*Cambridge International A and AS*

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	opposed to between, countries	**Intra-urban** **Inter-urban** **Stepped migration**	Theories and models: stepped or stepwise-migration, gravity model, Lee's migration model. Can be related to types of migration. Rural-urban migration in LEDCs (and MEDCs) Urban-rural/counter-urbanisation in MEDCs (and LEDCs) Causes/impacts of intra-urban migration. e.g. Harare –rural-urban migration Make links to settlement hierarchy with **Settlement dynamics** in mind.	*Level Geography* (Nagle and Guinness) Pages 126–134 Lee's model of migration is covered on Page 121 Section 2.2 Activities Page 133 and 135 **Past papers** June 2009 Question 10 Nov 2011 Question 11 (a) and (b)
2.3 International migration	Knowledge of types of migration leading to classification To understand reasons for migration in relation to an individual and mass migration	**Voluntary** **Forced (involuntary)** **Source area** **Receiving area** **International migration** **Refugee** **Asylum seeker** **Economic migrant**	Classification of migration **forced and voluntary** with examples. **A** This lends itself to a sorting exercise, where learners discuss and classify a number of examples of international migration. This could include causes, push factors, pull factors and consequences and/or specific examples of migration. In sorting the different elements, useful discussion usually occurs and may generate further enquiries. **A** Distinguish carefully between refugees and economic migrants. **TS Who migrates?** Consider the characteristics of the individuals who migrate. Behavioural model of migration. **Definition of migrability** i.e. the likelihood of an individual to	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 135–142 Case study of London Pages 141 and 142 Section 2.3 Activities Page 136, 139 and 140 Geofile Sept 2007 Migration From Poland to the UK

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
		Migrability **Mobility**	migrate from one area to another. Reflects his/her socio-economic status, physical and psychological make-up, etc. **Mobility** usually expresses the ability to move e.g. access to transport. Possible examples include: Natural disasters e.g. Montserrat Voluntary economic migration e.g. Mexico to USA Emigration culture e.g. Ireland Cultural diversification e.g. immigration to Australia Refugees e.g. Iraq, African states, Afghanistan, the Vietnamese boat people, Jewish people to Israel Malaysia North Africa to Europe	**Past papers** June 2011Question 5 June 2011 Question 10(a) and (b) Nov 2011Question 5
2.4 A case study of international migration	Knowledge and understanding of a case study of one international migration stream	**International migration** **Migration stream** **Mass migration** **Causes** **Characteristics** **Scale** **Pattern** **Impacts** **Source area** **Receiving area**	**TS Causes:** economic, social, environmental, political. Character Scale Pattern (spatial) Impacts on source area and receiving area. Should consider economic, social, environmental and political impacts. Use facts and statistics to support the arguments. **The case study** can be related to different aspects of migration e.g. forced/ voluntary, long/short term, long/short distance. Teachers may choose a local example which may be particularly accessible to learners. **Note:** that the syllabus does not insist on management of the population movement/resultant change, but it may be included.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 143–147 Mexico case study including line graphs, data tables and choropleth maps Section 2.4 Activities Page 147 **Past paper** Nov 2010 Question 11(b) www.refugeecouncil.org.uk

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
				www.spareroomsforrefugees.com www.statistics.gov.uk www.unhcr.ch www.sln.org.uk/geography

Paper 1 Human core – Unit 3: Settlement dynamics

Syllabus ref	Learning objectives		Suggested teaching activities	
	General introduction Knowledge and understanding of the distinction between urban and rural Relationships between settlements	**Rural** **Urban** **Settlement** **Function**	**TS** Provide two images: 1. Rural 2. Urban Challenge the class to define the terms on the basis of the attributes shown by each image. Usually photographs are the most appropriate images, but it could be a passage from a novel, a cartoon, a painting, a poem, etc. Be inventive. **A** A spider diagram could be built up from the image and other characteristics added as the class think of ideas associated with urban and rural environments. It does not take long but is an effective way of introducing the new unit. **TS** Introduce the idea of rural and urban areas as systems with inputs and outputs in order to maintain the links with the physical core. Suggest that they are both subject to change and processes that result in change over time. Hence the unit title 'Settlement dynamics'.	www.learningtolearn.spiderdiagramsl
3.1 Changes in rural settlements	To understand the reasons for and consequences of growth or decline of rural settlement or rural area A case study of a rural settlement or rural area is required	**Rural-urban migration** **Urban-rural migration**	Start by revising work already covered in Unit 2. Population on the move. Here emphasise the impact on urban growth rather than population change. **Case study of a rural settlement or rural area** This can be selected from an MEDC or LEDC. It is ideal if the example can be a local one familiar to the learners. Impacts of the two directional movements should be emphasised. Management of issues in the rural settlement or rural area	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 148–158. This provides background and Isle of Purbeck case study (Pages 155–158 and Section 3.1 Activities Page

Syllabus ref	Learning objectives		Suggested teaching activities	
		Counterurbanisation **Rural growth/decline** **Commuting** **Teleworking** **Farm diversification** **Sustainable development** **Rural conflicts** **Affordable housing**	resulting from growth (or decline). The case study should have detail about location (nationally, regionally, and locally), size, functions, land use, population structure (if possible), reasons for decline and/or growth. Accessibility, changing nature of economic activity, population change, trends, e.g. counterurbanisation, perceptions of rural life. Textbooks have good examples, which can be supplemented by other sources, e.g. maps and aerial photographs. Rural deprivation and poverty may be included in either LEDC or MEDC examples, e.g. lack of infrastructure, lack of services: financial, health, education. Changing lifestyles e.g. commuting, teleworking. Changing economic activity: tourism, farm diversification as possibilities for a rural area. Much depends upon the choice of case study. Any development strategies which are relevant to the chosen example, or of general application, can be considered. **Note 1:** These case studies do not always fit the questions ideally. Check past papers when selecting case study material. **Note 2:** This section should include management of the issues which will be dependent on the case study chosen of course. What is essential is the management responses to the issues identified: attempted solutions, successes and failures. They may be past, present and future.	158) Figure 3.5 Page 151 shows Model of Growth and Figure 3.6 Page 151 shows Model of Depopulation Page 158 provides a suggested field work activity based on this topic. Geofile 570 Jan 2008 Bagston Hill (UK): A Case Study of Village Suburbanization. **Past paper** Nov 2011 Question 6
3.2 Urban trends and issues of urbanisation	Knowledge of process of urbanisation	**Urban growth** **Processes:**	**TS** Suggest that so far the study has been a static one and now it is necessary to consider the processes.	*Cambridge International A and AS Level Geography*

Syllabus ref	Learning objectives		Suggested teaching activities	
	Knowledge and understanding of the processes associated with urbanisation	**Urbanisation** **Counterurbanisation** **Re-urbanisation** **Suburbanisation** **Causes:** **Push-pull factors** **Consequences:** **Urban sprawl** **Rural-urban fringe** **Rural-urban continuum** **Urban renewal** **Primate city** **Rank-size rule**	Growth links to the idea of urbanisation. **Definition** Distinguish between urbanisation (the concentration of population into urban areas) and urban growth (growth in population numbers and/or physical expansion of the urban area). Emphasise the distinction between these two terms. **Causes** and **consequences** of urbanisation in LEDCs and MEDCs. **Settlements change over time** Growth – introduce the idea of the primate city with a definition. Suggest the idea of rank-size simply. Do not need detail, but it helps to endorse the idea of primacy. **MEDCs** e.g. UK Historical background – 19thc urbanisation and industrialisation, i.e. shift from primary to secondary industry, rural-urban migration as a consequence. Growth of the inner city, suburbanisation. Outward unplanned growth - urban sprawl. 20th and 21st century car culture in the USA could be mentioned for comparative purposes. **A** Annotate a diagram to show the rural-urban continuum. Will include intra-urban migration, link to 2.2 Internal migration (within a country) **TS** Introduce the idea of a hierarchy of settlement within a country using the rank-size rule. Emphasise the idea of a theory and application to reality. Case studies to show applicability. Local case study might be appropriate. Definition/classification of cities. The concept of a world city. Global hierarchy of world cities of differing status e.g. alpha, beta	(Nagle and Guinness) Pages 158–168 Section 3.2 Activities Page 161, 163,166 and 168 Table 3.3 Page 160 shows World's Largest Cities 1960/2008 Figure 3.18 Page 161 shows World Urban Population in 2005 Figure 3.25 Page 165 gives Model of Gentrification Geofactsheet 165 Change and Conflict in the Rural Urban Fringe Geofactsheet 169 London: Contrasting Suburbs **Past papers** June 2011 Question 6 Nov 2011 Question 12(a) and (b)
	Concept of a world			

Syllabus ref	Learning objectives		Suggested teaching activities	
	city Growth Causes Hierarchy of world cities	**World city** **World city hierarchy** **Megacity** **Megalopolis**	and gamma world cities. Causes of world city growth: economic, social, political.	June 2010 Question 6 Geofile 546 April 2007 Shanghai Coping with Megacity Status
3.3 The changing structure of urban settlements	Knowledge and understanding of the structure and dynamics of urban areas Be able to link processes studied in 3.2 to outcomes of urban structure 3.3	**Bid-rent theory** **Spatial competition** **PLVI (peak land value intersection)** **Functional zonation** **Urban structure** **CBD** **Inner city** **Suburb** **Urban deprivation** **Residential segregation** **Multi-ethnicity** **Re-urbanisation** **Gentrification**	**Consequences of the processes: urban structure** **TS** Introduce bid-rent theory to establish location of the concentric rings. A simple graph of land value plotted against distance from the centre (PLVI) demonstrates changing land use across the urban area. **A** Need to explain and a graph can be built up and annotated. **TS** The idea of a model to simplify the complexities of the reality of land use in the urban area. The models are not examined but may help understanding. e.g. Burgess, Hoyt**,** Harris and Ullman, models developed for urban areas in LEDCs. Consider the pattern, details of characteristics of each area, e.g. housing density, type, age, etc. Land use: residential, retail, manufacturing, services. **Vertical, as well as horizontal, functional zonation** e.g. in the	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 169–177 Section 3.3 Activities Pages 173 and 177 Figure 3.30 Page 169 shows Zonal, Sector and Multi-Nuclei Models Figure 3.32 Page 170 shows Bid Rent Theory

Syllabus ref	Learning objectives		Suggested teaching activities	
		Urban renewal Counterurbanisation	CBD office space above ground floor retail. Character and function of the CBD should be emphasised, distinction between core and frame is appropriate. **Note:** Urban fieldwork is not compulsory, but questions may test skills and enquiry (Assessment Objective 3) and therefore knowledge of fieldwork methods ***is*** needed. **Reasons:** invasion and succession may not only be the result of economic and social factors, but also political factors, e.g. planning and changing government policy. For example, Johannesburg illustrates well how the post-apartheid government resulted in corporate business relocating to a northern suburb (Sandton), whilst the CBD was invaded by the black population who succeeded in taking over the high-rise, high value locations in the CBD with their small businesses (often ground floor retail and first floor services) and informal economy. These are the processes responsible for the urban structure outlined above. **TS Change in urban areas** Counterurbanisation, re-urbanisation and gentrification need to be introduced and discussed. Counterurbanisation (movement into rural area beyond the urban limit) should be distinguished from suburbanisation, which involves centrifugal movements to the suburbs of population and other functions, including • retail – out of town shopping and hypermarkets in suburban locations, • manufacturing and service industries moving to outer edge of urban space i.e. suburban locations	Figure 3.33 Page 171 shows Mann's Structure of British City Figure 3.41 Page 175 shows the Key Features of the CBD Geofile September 2007 Delimiting the CBD **Past paper** June 2008 Question 11 June 2009 Question 5 (a) and (b)

Syllabus ref	Learning objectives		Suggested teaching activities	
			Reasons for the changes: economic, social, political **TS** Consider the reasons why residential segregation develops within urban areas, e.g. race, ethnicity, language, religion, inertia, income/ability to pay, the local property market (landlords, gatekeepers), planning decisions, etc. **A** Ask learners to consider the advantages and disadvantages of living in a segregated area such as a particular neighbourhood, ghetto or cultural enclave.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 163–166 Geofile 538 January 2007 Reflections on Urban Segregation and Residential Differentiation
3.4 The management of urban settlements		**Brownfield site** **Greenfield site** **Pedestrianisation** **Urban renewal** **Decentralisation** **Infrastructure** **Green belt** **New Town**	**Consequences of urbanisation:** • Use of vacant land – building on brownfield or greenfield sites • Housing • Congestion - transport • Pollution • Unemployment There are four sections for case study here (a) shanty towns and/or squatter settlement in an LEDC; (b) the provision of infrastructure for a city; (c) the inner city in an MEDC; and (d) strategies for reducing urbanisation in LEDCs.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 178–181 Squatter Settlements in Sao Paulo Activities Section 3.4 Page 181 *Cambridge International A and AS*

Syllabus ref	Learning objectives		Suggested teaching activities	
		Informal settlement **Shanty town** **Squatter settlement** **Slums of despair** **Slums of hope** **Self-help schemes** **Site and services schemes** **Rural growth poles** **Top-down or bottom -up strategies**	It may be possible to choose a case study of a city which can address two or more of these aspects, if covered in enough detail. **Inner city in an MEDC** This could be taught using a case study such as the London Docklands, Birmingham or Glasgow, UK or New York and Los Angeles, USA. Emphasis is on difficulties of inner city areas and attempted solutions. Management may include specific strategies or initiatives and local authority planning policy. **LEDCs** It may be possible to select a case study of shanty towns and/or squatter settlement, which can also be used to consider strategies for reducing urbanisation. There must be management of the shanty/squatter area also. **TS Causes: rural-urban migration**. Push-pull factors, cross reference to MEDCs as well. • Environmental factors e.g. land use and productivity • Social factors e.g. characteristics of the population • Economic factors e.g. prospect of employment • The attraction of the urban area should be considered. This links back to migration and carrying capacity in Units 2.2 and 1.3 **Consequences of urbanisation in LEDCs** Informal settlements - shanty towns/squatter settlements Location, characteristics, problems management of these areas within the urban structure.	*Level Geography* (Nagle and Guinness) Pages 181–184 Provision of Infrastructure in Cairo Section 3.4 Activities Page 184 *Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 185–188 Inner City of a MEDC – Inner London Section 3.4 Activities Page 188 *Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 188–190 Strategies for Reducing Urbanisation in China Section 3.4 Activities Page 190 Geofactsheet 180 Global Patterns of Slum Housing

Syllabus ref	Learning objectives		Suggested teaching activities	
			Distinguish between slums of despair and slums of hope. The latter are the location of site and services schemes, housing improvement, stronger social structures, etc. **A** Analyse a map of location of informal settlements Could compare a photograph of a squatter settlement with that of an inner city area - describe, annotate and explain. **TS** Compare the structure of an LEDC city with that of an MEDC city. **A** Put the two idealised models on one page and discuss and annotate. The LEDC model will vary depending on location e.g. SE Asian city or Latin American city **TS** Management of rapid urbanisation in LEDCs. • Self help housing schemes • Infrastructure improvement • Traffic management schemes to reduce pollution - Land use planning for the future - Rural development strategies - Appropriate technology Provides the link back into Changes in rural settlement, Unit 3.1.	**Past papers** Nov 2010 Question 12 Nov 2011 Question 12(c) Geofile 514 Jan 2008 Housing Solutions in LEDC Cities *Cambridge International A and AS Level Geography*

Syllabus ref	Learning objectives		Suggested teaching activities	
				(Nagle and Guinness) Pages 171–172 Geofile 515 January 2006 Sustainable Cities

Paper 2 Physical options – Unit 1: Tropical environments

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	Introduction The intention is to convey an overview of the option at the outset. Main climatic types, biomes and their locations in the tropics	**Biome** **Equatorial climate** **Savanna climate** **Monsoon Climate**	Study a world map of the major biomes of which the tropical rainforest (TRF) and savanna are two. Consider latitudinal distribution. Relate to the global climate map and global population distribution. Emphasise the humid tropics/low latitudes and links between the sub-sections of climate, vegetation and soils in the syllabus through these maps. **A** Give climate data for selected stations e.g. equatorial climate (humid tropical), savanna climate seasonally humid tropical), monsoon climate. Plot data, describe in detail climatic characteristics of each as a lead in to explanation. **Why are the tropics an issue?** Brief, general discussion of wilderness areas, outstanding physical environments, biodiversity, resources, endangered species, the threats posed by indiscriminate exploitation and the need for conservation. Possible development of links to Advanced Human Options Unit 2 Environmental management and 3.3 about tourism.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Figure 1.1 Page 191 shows Tropical Climates A comprehensive website: www.discoveramazonia.co.uk/ www.worldclimate.com
1.1 Tropical climates	To understand the characteristics of and variations in tropical	**Hadley Cell** **ITCZ** **Air mass**	The foundations will have been laid at AS through Unit 2 Atmosphere and weather. See 2.2 Earth-atmosphere energy budget and general circulation, etc.	*Cambridge International A and AS Level Geography*

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	climates and their causes	**Jet stream** **Thermal equator**	**Explanation of climates** Good starting point – general circulation of the atmosphere. Focus on the Hadley cell. Formation of ITCZ, low pressure at the Equator, descending air at 30˚ N and S, producing high pressure. Air masses, associated wind belts – trade winds. Migration of thermal equator according to the seasons. Relate to the resultant changing position of pressure and wind belts, on-shore/offshore winds and resultant rainfall. Relationship of earth to sun as it moves to produce seasonal variations in temperature. Ocean currents have an influence. **Examples** 1. West Africa aptly demonstrates the change from equatorial to savanna climate with seasonal variation in rainfall. It may be appropriate to introduce the West African ecocline (vegetation transect) to demonstrate links between climate, vegetation and human activities. 2. Indian sub-continent Monsoon climate. Sub-tropical jet stream and relation to surface conditions. Well annotated maps can be very useful for both examples and can be used in an examination answer for explanatory purposes.	(Nagle and Guinness) Pages 191–202 Section 1.1 Activities Pages 191,193,194, 195 and 197 Figure 1.4 Page 193 shows ITCZ and Surface Winds Figure 1.6 Page 196 shows the Asian Monsoon Figure 1.7 Page 196 shows Rainfall in India **Past papers** November 2011 Question 2(a) June 2010 Question 1(a) November 2010 Question 2(a)
1.2 Tropical ecosystems	Introduction to the concept of an ecosystem. To understand the	**Ecosystem** **Plant community** **Climax vegetation** **Plagioclimax vegetation**	**Vegetation** This section needs an introduction to the ecosystem as a concept, and its structure, functioning and development over time. Soil characteristics and formation is also included. Focus on TRF and Savanna ecosystems.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 202–214

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	characteristics of and processes within tropical rainforest and savanna vegetation	**Sub-climax vegetation** **Biomass** **Productivity** **Gross Primary Productivity** **Net Primary Productivity** **Trophic levels** **Nutrient cycling** **Gersmehl diagram** **Biodiversity** **Sere**	**Biomass –** total mass of living organisms present in an area. Expressed as mass per unit area measured as dry weight. It is a weight, compared with productivity, which is a rate. **Productivity –** rate of energy production, usually on an annual basis. Gross Primary Productivity (GPP) total energy production including respiration. Net Primary Productivity (NPP) is the total amount of energy transferred from sunlight into organic matter (photosynthesis) minus the energy lost via respiration. It is expressed as a rate g/m²/yr. **Food chain/webs** **Trophic levels** – a feeding level within a food chain from which energy is lost. Biodiversity a term used to describe the variety of species, both floral and faunal within an ecosystem. **Nutrient cycling** – Gersmehl diagrams. Plant succession, climax vegetation, plagioclimax, seres, prisere, sub-seres, plagioseres seral stages, sub-climax. **Tropical rainforests** – structure, characteristics, adaptations, nutrient cycling. Relationship to climate/reasons for the nature of the forest/large biomass/high productivity, etc. Could introduce case study material here and consider both human and physical factors which determine the nature of the forest, or it can be done as a separate section after all the theory is covered. Familiarity with secondary succession and how it differs is important. **Savanna**	Section 1.2 Activities Pages 204, 207, 214 Figure 1.3 Page 202 shows Mean Net Primary Productivity and Biomass Figure 1.14 Page 203 shows Model of Succession Figures 1.24 and 1.25 Page 208 shows Gersmehl's Nutrient Cycle and Nutrient Cycles in a Tropical Rainforest Figure 1.22 Page 202 shows Vegetation Structure of a Tropical Rainforest and Figure 1.30 Page 211 shows Savanna Nutrient Cycle. 'The Rain Forest Paradox' *Geography Review* Sept 1998 pp.7–9

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	To understand the factors affecting soil formation and characteristics	**Soil profile** **Leaching** **Capillary action** **Gleying** **Laterisation** **Ferrallitisation** **Duricrust** **Catena**	Characteristics, adaptations of vegetation to seasonal variation of rainfall, nutrient cycling, productivity rates. Comparison with TRF and explanation of differences. Spatial variation of vegetation (ecocline) north to south across the savanna in West Africa to demonstrate the spatial variation in seasonal rainfall. **Soils** Basic background detail if soils have not been studied previously. Definition of soil, composition, structure. **Factors which influence soil formation** – climate, vegetation, relief, fauna, geology, time. **Soil forming processes** – precipitation-evaporation ratios, leaching and upward capillary action; gleying, ferrallitisation, laterisation, calcification, duricrusts. **Soil profiles for tropical soils** – Oxisol/latosols/ferrallitic soils. Familiarity with at least one tropical soil. Well annotated diagram will fulfil requirements. **Catena** is a down slope sequence of soils which reflects differences in drainage conditions. The influential factors are slope angle, water table, aspect, vegetation and climate. Rock type is constant. **Note:** See Cambridge *Example Candidate Responses (Standards Booklet)* at http://teachers.cie.org.uk for an excellent candidate response/possible model answer to a question on catenas. Human impact on tropical soils should be covered either here or in the final section of the unit.	Geo Factsheet 25 Energy Flow and Nutrient cycling in Tropical Rainforests **Past papers** June 2011 Question 1 November 2011 Question 1(b) November 2011 Question 2(a) June 2010 Question 2(a) November 2010 Question 1(a) *Cambridge International A and AS Level Geography* (Nagle and Guinness) Figure 1.27 Page 210 shows Savanna Soils and Figure 1.28 shows a Soil Catena in the Savanna.

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
1.3 Tropical Landforms	To understand the processes of tropical weathering and their effect on landforms of granite and limestone in the tropics	**Exfoliation** **Dilation** **Hydrolysis** **Hydration** **Carbonation** **Tor** **Inselberg** **Etchplain** **Pediplain** **Tropical karst** **Tower karst** **Cockpit karst**	The theme of this section of work should emphasise the link between process and form. It will be familiar from AS work. See the AS Level scheme of work 3.2 Weathering and rocks and 3.3 Slope processes and development. **Weathering processes** **Physical** – Exfoliation, dilatation, crystal growth, frost action. **Chemical** – Hydrolysis, hydration, carbonation. Reminder of the Peltier diagram. Also latitudinal variation of weathering depths – link to basal surface of weathering. **Factors influencing weathering rates** – Van't Hoff's Law, importance of water, rock structure – joint pattern – increasing surface area and allows ingress of water. Influences both *rate* and *amount* of weathering. **Granite** – Characteristics of granite composition and structure. Weathering of granite: hydrolysis. Weathering front-basal surface, joint pattern, corestones, saprolite. **Evolution of landforms** – Etchplanation theory: deep weathering; exhumation by stripping – reasons for stripping, i.e. climate change, fluvial activity, vegetation removal, cyclical nature of the stripping. Pediplanation – uplift of a pediplain; vertical fluvial incision; pediment formation and role of water in lateral planation of these surfaces and relation to parallel retreat of slopes. Link to Unit 4.2 Processes producing desert landforms. **Landforms** – Pediplains, etchplains: inselbergs, ruwares, bornhardts, koppies/kopjes, tors.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 214–222 Section 1.3 Activities Pages 215 and 217 Figure 1.37 Page 216 shows Peneplanation and Figure 1.38 shows Pediplanation Figure 1.43 Page 218 shows Tor Formation and Figure 1.47 Page 220 shows Karst Scenery Excellent images of landforms: www.geoimages.berkeley.edu www.siue.edu/GEOGRAPHY/ONLINE/Gillespie.htm www.istrianet.org **Past papers** June 2011 Question 2(a)

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
			Limestone – Characteristics of limestone composition and structure. Joint pattern, bedding planes and vertical joints. Permeability. **Weathering process –** Carbonation-solution. **Tropical karst limestone forms** – Emphasise vertical nature of the weathering to produce scale of these landforms. **Landforms** – Cockpit karst, tower karst, mogotes.	November 2011 Question 1(a) June 2010 Question 1(b) November 2010 Question 2(b)
1.4 Sustainable management of tropical environments	To acquire in-depth knowledge and understanding of **one** tropical environment, focusing on: • its location – use of sketch maps • the issue affecting sustainability • the strategies employed to increase sustainability • the relative success of those strategies (i.e. positive and negative aspects)	**Sustainability**	The big idea in this section is sustainability in relation to the functioning of the physical environment and human use of that environment in order to maintain its resources. Carrying capacity, soil erosion, leaching, infertility. Link to human activities. Management strategies. Discussion should include evaluation of the success of the management. Zoning, biosphere reserves, conflicts which arise. **Case study: TRF ecosystem or savanna ecosystem** **Tropical rainforest (TRF)** Deforestation, problems associated within the physical environment: soil erosion, leaching, consequent infertility, breakdown of nutrient cycles, loss of productivity NPP. Changing albedo, implications for global climate change. Therefore extend local effects to global impact. Also forests as carbon sinks, link to atmospheric pollution and climate change. Loss of agricultural potential. Carrying capacity, sustainable population levels, indigenous populations. Human activities: agriculture – sustainable bush fallowing, commercial large scale agriculture – plantations, ranching. Other activities: mining, tourism, ecotourism. Biofuels. It is important that soils are treated as part of	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 223–226 Good images at: www.nasa.gov Focus on Brazilian rainforest: www.inpe.br *Geography Review* November 2003 pp.24–6 'Desertification in Southern Africa' *Geography Review* September 1996

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
			the system from the point of view of management. **Optional discussion activity –** Mature TRF produces as much CO_2 as it absorbs. It is only when the forest is growing that it acts as a sink. Apparently it would be best to chop down all the TRF, use the wood for building and replant so that the TRF regrows, absorbing more CO_2? Scale of human activity scale of climate change that might result – local, global. **Savanna** Rainfall reliability, drought, desert margins –Sahel – use the West African example again. Overpopulation, nomadic pastoralism, indigenous populations, changes to sedentary agriculture, way of life, pressure on the natural environment. Desertification e.g. Sahara margins – Sahel. Possible aspects – Masai, Fulani tribes. Tourism – National Parks and the impact of safaris. Management strategies. Water availability. There is case study material in many textbooks. It might be advisable to study both TRF and savanna if time allows. One could always be set as a research exercise, provided that a guide to the structure is provided by means of side headings. Learners may enjoy this sort of task. If structure is not indicated sheaves of undigested internet research may appear. PowerPoint presentations can be a useful method of presentation, in which the whole group can share, provided they are kept short and the technology is available. Pasoh Forest Malaysia has all the necessary ingredients of physical environment and human activities which threaten the natural environment and conservation/protection measures/management.	Geo Factsheet 24 The Causes of Aridity Geo Factsheet 28 Desertification: Causes and Control **Past papers** November 2011 Question 2(b) June 2010 Question 2(b) November 2010 Question 1(b)

Paper 2 Physical options – Unit 2: Coastal environments

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
2.1 Wave, marine and sub-aerial processes	To understand that coasts are the meeting point of land, sea and atmosphere and that all three affect the nature of the coastline To understand the process acting upon the coastline	**Wave height, length, frequency, crest, trough** **Fetch** **Swash** **Backwash** **Constructive wave** **Destructive wave** **Wave refraction** **Sediment cell** **Hydraulic action** **Wave quarrying (cavitation)** **Corrasion/ abrasion** **Attrition** **Solution**	Sections 2.1 and 2.2 are very closely linked such that in studying waves it is sensible to study their impact on beaches or other depositional features. **Waves** **Definition of a wave** Waves are oscillation of the water surface. Make the point that the water does not move forward. **Wave terminology** Wave height, length, frequency, crest, and trough. This can be done by means of a diagram. **Formation and size of a wave** 1. Wind velocity 2. Depth of water 3. Fetch i.e. the distance that the wind has travelled across the water surface, influences the nature of the wave. Waves possess energy; therefore have the ability to carry out processes. **Zones** – breaker, surf and swash. **Breaking waves** Waves break when the water depth is too shallow to support the whole oscillation. **Swash** Forward movement of water up the beach. **Backwash** movement of water down the beach. Relative strength of the two influences the nature of the wave. **Constructive waves/swell waves** Swash is greater than backwash – large fetch, long wave length, low height, found on low gradient beaches, low energy waves which deposit material. **Destructive waves/storm waves** Backwash is greater than	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 227–234 Figure 2.1 Page 227 shows Water Movement Figure 2.2 Page 228 shows Wave Terminology Figure 2.3 Page 228 shows Types of Breaker Figure 2.4 Page 228 shows Constructive Waves Figure 2.5 Page 229 shows Destructive Waves Figure 2.8 page 230 shows Wave Refraction

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
			swash – short fetch, short wave length, high waves and frequency, found on steeply sloping beaches, high energy waves which erode. Low energy coasts High energy coasts **Wave refraction** – link to headlands and bays. Variations in water depth – deeper water around headlands, concentration of erosion whereas deposition in bays. Wave refraction off the end of a spit – link to deposition and recurved ends of the spit. **Relationship between wave type and beach profile** Learners should understand the relationship between the two wave types and beach profiles. Explain how beaches may be in a state of dynamic equilibrium because the steeper profile produced by swell waves will cause destructive waves which comb material down the beach and may deposit if offshore. This will reduce the gradient of return to constructive waves. Will introduce ideas of erosion, transportation and deposition of material. Beach profiles may show significant variation between the stormy seasons and less stormy seasons due to variations in wave energy and dominant wave type, linked to wind direction. One approach to the study of processes is via the sediment cell. A unit of study which considers a section of coastline in terms of an 'open' system and dynamic equilibrium between erosion and deposition, sources/inputs and sinks/outputs, of sediment. Sources of sediment: weathered cliffs, beach material, offshore bars, river sediment, in-drift of material from adjacent littoral cell, beach nourishment. Sinks: offshore bar, beaches (could be in the form of a spit), sand dunes, out-drift to next sediment cell. Transport along the cell (LSD, longshore drift) current and tidal action within the cell. Cells are ideal units for study of coastal	Figure 2.9 Page 231 shows Longshore Drift Figure 2.12 Page 223 shows Sediment Cells Section 2.1 Activities Pages 229 and 234 www.geography@btinternet.co.uk is the best website for links. Recommended for all aspects of coasts. www.s-cool.co.uk also has links. **Past papers** November 2010 Question 3(a) June 2009 Question 4(a)

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
			management – link to 2.4 and the landforms in 2.2. **Marine processes** Waves as agents of: **Erosion** **Hydraulic action or impact** i.e. the sheer force of the waves exerts a pressure which can be up to 30000kg/sq.m in storms. **Wave quarrying (cavitation)** is the compression of air in openings in the rocks at the coast as the wave hits. Decompression takes place as the wave recedes. This process weakens the structure and increases surface area for other forms of erosion. Therefore large blocks can be 'quarried' (removed from the cliff face). Also known as quarrying. **Corrasion/abrasion** in which the load carried by the breaking waves acts as a tool, rather like sandpaper, smoothing the rock. Important in producing the notch at the cliff base and in shaping wave cut platforms. **Attrition** reduction in calibre of the load carried by waves as abrasion occurs between the particles. **Solution** is active in calcareous rocks like chalk and limestone where carbonation-solution creates soluble material which is carried away by the waves.	
2.2 Coastal Landforms of Cliffed and Constructive Coasts	To understand that coasts are the meeting point of land, sea and atmosphere and that all three	**Cliff profile** **Isostatic/eustatic** **Strata** **Dip** **Shore platform**	This section is closely linked to Section 2.1 and so the two parts could well be integrated. **Landforms produced due to coastal erosion**	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 234–245

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	affect the nature of the coastline	**Bay** **Headland** **Cave** **Arch** **Stack** **Longshore drift** **Swash** **Backwash** **Beach profile** **Spit (simple and compound** **Bar** **Tombolo** **Sand dunes** **Salt marsh** **Estuary**	**Cliffed coastlines** **Erosion** Evolution of a typical cliff profile: cliff, notch, abrasion/wave cut platform, beach. **Cliffs** should be studied in profile (cross section) and plan. This is an important distinction which should be known. **Form** Factors influencing cliff form: i. Sub-aerial processes of weathering and mass movement. Detail about processes e.g. frost shattering, carbonation-solution, hydrolysis – those processes which typify the coast rather than weathering itself. Similarly with mass movement. ii. Lithology and rock structure iii. Isostatic and eustatic changes iv. Human activity **Simple form:** **Vertical cliffs** in massive resistant rock, e.g. chalk, limestone, granite. **Complex/composite form** – Mixed lithology which have undergone rotational slip. **Slope over-wall cliffs** actively eroded cliff base and a contrasting upper slope of 'dead'/degraded cliff between 5 and 50˚ which represents past periglacial processes when sea level was lower. Rise in sea level has produced new vertical cliff face. **Influence of dip of strata** – horizontal, vertical, seaward and landward dipping.	Figure 2.15 Page 235 shows Caves, Arches, Stacks and Stumps Figure 2.18 Page 238 shows Wave Cut Platforms Figure 2.20 Page 237 shows Factors in Cliff Stability Section 2.2 Activities Pages 238, 240, 241, 242, 244 and 245 Figure 2.25 Page 239 shows Beach Deposits Figure 2.28 Page 240 shows Depositional Features Figure 2.31 Page 242 shows Formation of Barrier Island Figure 2.34 Page 243 shows Sand Dune Succession and Figure 2.36 shows Salt Marsh Formation

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
		Swash aligned coasts **Drift aligned coasts**	**Active and inactive cliffs** – the latter are dominated by sub-aerial processes. **Shore platforms –** raised beaches and degraded clifflines, linked to sea level change. Development of spits may lead to degraded clifflines as wave attack is prevented. Annotation of photographs can be a useful exercise. Human activities may be introduced here, e.g. building on cliff tops may be a contributory factor in cliff collapse/rotational slip. **Headlands and bays** and their relationship to lithology along a section of coast. Plan and headland profile: evolution of landforms produced due to erosion on the headland (deep water, wave refraction, concentration of erosion on the headland: caves, arches, stacks). Deposition: Having considered headlands and focused on erosion, the logical progression is into bays, and deposition, shallow water and breaking waves. **Marine processes** **Transportation** the direction of movement is related to direction of the prevailing wind and direction faced by the coast. Material may be carried up and down the beach if the prevailing wind is at right angles to the coast, or along beach if the wind approaches at an oblique angle. **Longshore drift (LSD)** Longshore currents may be important in bays where wave refraction is significant. **Deposition** If swash is greater than backwash – beaches are constructed/built up and if longshore drift is taking place then beaches are built along the shore.	Geo Factsheet 129 The Impact of Structure and Lithology on Coastal Landforms Geo Factsheet Number 145 April 2003 Coastal deposition www.curriculum-press.co.uk Geofile 544 April 2007 Salt marsh Ecosystems Geo Factsheet 160 The Importance of Wetlands **Past papers** June 2011 Question 3(b) June 2011 Question 4(a) and (b) November 2011 Question 4(a) June 2010 Question 3(b) June 2010 Question 4(a) June 2009 Question

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
			Coastal landforms of constructive coasts **Beaches** should be studied in profile (cross section) and plan. Gradient, variation in calibre of material from cliff to low tide, storm beach, berm, offshore bar. Relate back to wave type – constructive/destructive and swell and storm profiles, 2.1. **Micro-features –** ripples, cusps, runnels. Formation of these features and understanding of processes operative to produce these small features. Beaches that develop due to longshore drift: **Spits** **Simple spit** is a fairly long narrow straight ridge of sand shingle with one end attached to the mainland and one end in open water. **Compound spits** which have laterals/recurved laterals. Evolution of spits. **Bars** A bar has both ends attached to the mainland. Usually has a lagoon behind it, e.g. Slapton Sands and Slapton Ley (lagoon behind the bar), Devon, UK. **Offshore bars** and relationship to spits and longshore drift. e.g. Chesil beach, Dorset, UK, in which offshore material deposited during the Pleistocene has moved inland as a result of the Flandrian transgression (post glacial rise of sea level). **Tombolos** **Barrier islands** relationship to offshore bars.	4(b)

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
			Coastal sand dunes –formation, form and plant succession in relation to stabilisation of the sand. **Estuaries –** deposition, mudflats. **Salt marshes** may be considered in relation to spits and tidal sedimentation in estuaries. Plant succession in so far as the vegetation stabilises the sediment. Throughout links can be made to 2.4. Human activity is relevant and important in influencing the stability and long term nature of these landforms. Depositional landforms in particular are unstable and fragile environments.	
2.3 Coral reefs	To understand the formation, characteristics and distribution of coral reefs, along with the necessary conditions for coral growth	**Coral polyp** **Symbiotic relationship** **Algae** **Fringing reef** **Barrier reef** **Atoll**	**Formation and development** Understanding of a coral polyp - a single organism living in a symbiotic relationship with zooxanthellae/algae. Ability of coral to build reefs by production of calcium carbonate. Reef form related to algal variety. This is necessary basic understanding, although questions are likely to focus on reef form and theories of formation. **Conditions for growth of coral:** **Temperature** 23–25˚C **Water depth** less than 25m but not exposed to air **Light** for photosynthesis **Salinity** required **Clean, clear water** sediment free **Well-oxygenated water** produced by strong wave action **Global distribution of coral** Tropical seas between Tropics of Cancer and Capricorn. Offshore, on eastern and western continental and island margins.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 245–250 Section 2.3 Activities Pages 247 and 250 Figure 2.37 Page 247 shows World Distribution of Coral Reefs Figure 2.38 Page 247 shows Fringing Reefs, Barrier Reefs and Atolls

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
			Forms of reefs Fringing; barrier; atolls. Demonstrate links between the three forms. **Theories of formation** Darwin, Daly and Murray. Darwin is the best documented and demonstrates the evolution from fringing through barrier to atoll. Limited spatial application. Will include causes and effects of sea level change on reefs – may link directly to human activity. Coral reefs would be an excellent example to use for sustainable management of a section of coastline, see 2.4. However, alone, a reef cannot exemplify all the aspects of human impact which require study, so it needs to be used in addition to one or more other case studies.	Geofile 519 April 2006 Coral Reefs **Past papers** June 2011 Question 3(a) November 2011 Question 4(b)
2.4 Sustainable management of coasts	To acquire in-depth knowledge and understanding of **one** coastal environment, focusing on: • Its location – use of sketch maps • The issue affecting sustainability • the strategies employed to increase sustainability • the relative success of those strategies (i.e. positive and negative	**Sustainability** **Coastal protection** **Hard engineering** **Soft engineering**	**One stretch of coastline** This should be of manageable length i.e. not the whole south coast of the UK. A littoral cell is a useful unit for study. Ideally it includes both cliffs and depositional features resulting from longshore drift. Consideration of balance between natural processes and human influences. Management strategies. **Coastal protection measures** Hard and soft engineering, integrated planning e.g. SMPs (Shoreline Management Plans), government policy, managed retreat, 'do nothing'. Conflicts and local issues which may arise. Cost-benefit analysis of alternative protection measures. Sustainable management may involve more than coastal protection, i.e. zoning of human activities, marine reserves, limits on fishing.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 250–260 including case studies Geo Factsheet Number 141 Holderness Coast (UK) A study of coastal management www.curriculum-press.co.uk **Past papers**

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	aspects)		A range of case studies may be considered more appropriate which illustrate particular threatened landforms e.g. coral reefs, spits, salt marshes (see below). However, ideally, learners should appreciate the balance of processes along a section of coastline and be able to evaluate the advantages and disadvantages of the possible solutions, which may involve both physical protection and human utilisation of a stretch of coastline. A coral reef coastline may not offer sufficient coverage of all aspects of this unit so that, whilst it exemplifies a coastal area under threat, the range of landforms is somewhat restricted and it is advisable to consider examples of other stretches of coastline, too. **Note:** Be careful about the use of textbook case study material which may not be familiar to the learner. Start with a well labelled map so that they have a spatial context; try to find photographs as well. Maps can be a useful and time-saving means of describing a coastline provided the detail is included.	November 2011 Question 3(b) June 2010 Question 4(b) November 2010 Question 4(b) June 2009 Question 3(b)

Paper 2 Physical options – Unit 3: Hazardous environments

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	Introduction The intention is to convey an overview of the option at the outset. Main types of hazard, forecasting (prediction) and human response	**Hazard** **Tectonic** **Geomorphological** **Atmospheric**	**General introduction to hazards** **Definitions of terms** Hazard and disaster. **Relationship between the physical event and human population** Where the two overlap – that is the hazard/disaster. **Classification of hazards:** **Tectonic or crustal –** Volcanic activity and earthquakes (3.1) **Geomorphological –** a range of mass movements, landslides, mudflows and avalanches (3.2) **Atmospheric** – tropical storms and tornadoes (3.2) Should also include coastal and river flooding. **Factors which influence the impact of hazards** such as: economic (e.g. level of development); social (e.g. ethnic groups, education); physical (e.g. magnitude and frequency); political (e.g. aid, international relations); psychological (e.g. perception of risk). **Location –** Start with a world map showing relationship between hazards and population distribution and densities. Annotate, highlight multi-hazardous zones. Discuss level of economic development and likely variations in impact and response. Encourage learners to keep diaries of hazardous events as they occur throughout their course. Newspaper cuttings, television/radio news; current internet sources. They should record date, time, magnitude, location, cause, impact, scale of response –short term/longer term; local, national, global.	Links to volcanoes: www.geography@btinternet.co.uk Newspapers are an excellent resource: www.guardian.co.uk www.Vulcan.wr.usgs.gov www.adpc.ait.ac.th www.volcanoes.com

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
			Introduce idea of increasing frequency of hazardous events and numbers affected. Reasons: Global warming? Population increase? Relationship between magnitude and frequency; recurrence intervals. **Prediction –** Precaution, protection, prevention, preparedness, costs, benefits, aid, insurance, perception – acceptance – deterministic view where the environment is in control, adaptation, dominance i.e. 'technological fix' – the opposite of acceptance, so human control of the environment by engineering and technology. Discussion of this philosophical issue may generate interest and further enquiry. Management strategies which involve technological fix acceptance and/or adaptation. Discussion would include assessment of costs and benefits of strategies chosen. Forecasting and prediction of hazards, e.g. weather/tropical storms. Differences in response due to variations in levels of wealth, economic and technological development. **Differentiate between forecast and prediction:** **Forecast** is a relatively imprecise statement of time place and nature of the expected event' **Prediction** is a relatively precise statement of time place and ideally the nature and size of the event i.e. a precise forecast' **Human response to hazards** Introduction to basic ideas of risk and vulnerability: **Risk –** exposure of people to a hazardous event. **Vulnerability** – the ability of a person or group to anticipate, cope with and recover from the impact of a natural hazard. It may be that these ideas are best conveyed through case study material, rather than as general principles. This is a matter of individual choice and resources. However the ideas form the	

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
			guidelines which can be followed in each of the units of this option.	
3.1 Hazardous environments resulting from crustal (tectonic) movement	To understand the distribution, causes and characteristics of tectonic hazards To understand the difficulty of prediction and the variations in impact and human responses	**Constructive, destructive and conservative plate margins.** **Divergent, convergent and passive plate boundaries** **Hot spots** **Pyroclastic Nuées ardentes** **Acid/viscous lava** **Basic/fluid lava** **Lahar**	**Activity related to tectonic plates:** **Definition/description** i.e. lithospheric plates **Global distribution –** Relate to plate boundaries – global distribution of tectonic plates. Definition of a tectonic plate; activity related specifically to plate margins. Add reminder about relationship to population distribution. Not random, linear, coastal. **Types of plate margin –** Convergent/destructive; divergent/constructive; conservative/passive. **Causes of plate movement –** Convection currents relate to direction of movement – slab pull at the destructive margins and slab push at the mid-oceanic ridges. Relation between crustal creation (divergent margin) and crustal destruction (convergent margin). Rates of movement. Clear well annotated diagrams are ideal here – ones that can be reproduced easily. **Activity associated with tectonic movements:** **Volcanic activity –** Relationship between plate margin and type of activity. **Destructive margins –** Explosive activity, pyroclastic flows/nuées ardentes, ash fallout, acid viscous lava flows. **Resultant landforms –** Dome volcanoes – high, steep-sided, narrow cones. **Constructive margins –** Less explosive activity – fluid, basic, basalt lava flows, fire fountaining, lava bombs e.g. Iceland. Resultant landforms: shield cones – low, gently-sloping, wide cones. **Conservative margins –** Little vertical displacement, largely horizontal movement, produces earthquakes. Link to next section	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 261– 274 Figure 3.1 Page 261 shows Plates, Plate Boundaries, Volcanoes and Earthquakes Figure 3.2 Page 262 shows Hotspots Figure 3.6 page 268 shows Types of Eruption Figure 3.1 Page 264 shows the Mercalli Scale Figure 3.3 Page 263 shows Seismic Waves Section 3.1 Activities Pages 267, 270, 271 and 274

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
			on earthquakes. Emphasise hazardous nature of the activity: pyroclastic flows, lava flows and bombs, fire fountaining and lahars. Location especially 'Pacific Ring of Fire'. **Hot spots** e.g. Pacific plate. These are 'plumes' of molten material from the mantle which are ejected on the surface far from a plate boundary. They tend to produce isolated activity and can occur on continents as well. **Secondary activity:** **Lahars –** mudflows. Link to 3.2. A lahar is a type of mass movement. Best example is Nevado del Ruiz in Colombia, 1985 case study, page 271. **Climate change –** as the addition of dust to the atmosphere results in temporary cooling, e.g. Mt Pinatubo. **Prediction –** monitoring indications of imminent activity such as harmonic tremors, bulges in the cone, geochemical changes, gravitational changes, temperature changes, satellite monitoring. **Reduction –** control, hazard mapping, building structures. **Human response to volcanic activity** Case studies best exemplify this section. Highlight the physical causes and nature of the activity. The example should be closely tied to the relevant plate boundaries so that the causes and nature of the eruption are clearly known and understood. The links can be made to the impact on the population. Two case studies which contrast the type of activity and level of economic development of the country would be ideal. **Earthquakes** Definition of terms: focus, epicentre, seismic waves.	Geofile 554 Sept 2006 Plate Boundaries Himalayas and Pacific USA Geofile 526 Hot spots in Plate tectonics Evolution of a Theory Use key words for search engine, e.g. *Montserrat Volcanic observatory* Geofile 536 Jan 2007 Physical Disaster Warning systems British Geological Survey: www.earthquakes.bgs.ac.uk Use key words of location of an earthquake to locate factual information on the internet. In the case of a recent event CNN

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
		Focus **Epicentre** **Seismic wave** **Magnitude** **Liquefaction** **Tsunami**	Measurement of earthquakes: Richter (magnitude) and Mercalli (intensity) scales. Seismograph (instrument) seismogram (print out of magnitude of seismic waves). **Causes:** Link to conservative plate boundaries, fault lines. Appreciate that the effects extend beyond the immediate plate boundary. Ground movement, landslides. Other physical factors may compound the impact: geological conditions; liquefaction. **Management of the hazard** **Prediction** Seismic gap theory. Monitoring of earthquake zones – use of instruments. Hazard mapping; community preparedness, e.g. Earthquake Awareness Day in Japan; hard engineering: earthquake proof building structures are an example of technological fix. **Human response to earthquakes** Two contrasting case studies **–** Earthquakes of similar magnitude, one in an LEDC and one in an MEDC. Good examples: Iran 2003 and California 2003. Kobe 1995 is an excellent example of an earthquake which had a huge impact on a country seemingly prepared. Provides many issues for discussion and is well documented. Examples should relate to the particular plate boundary and contain factual detail. Issues of the causes, hazardous nature and impact of the event should be at the core of the study. Scale is a useful framework: area affected; long and short term impacts. Awareness of secondary events e.g. mass movements: landslides and mudflows. Link with 3.2 mass movements. These activities can compound the hazard.	and the BBC are useful sources of up-to-date information. Geo Factsheet September 2002 Number 133 Earthquakes: Why do some places suffer more than others? Geofile 513 Jan 2006 The Asian Tsunami Geo Factsheet 179 Tsunamis – Rare but Devastating Geo Factsheet 194 Tsunami + 1 – An Analysis of the Response **Past papers** June 2011 Question 6 November 2011 Question 5 June 2009 Question 5(a) June 2008 Question

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
			Tsunamis Definition – popularly known as tidal waves, but not linked to tides. Causes and formation, link to earthquakes. Nature of hazardous activity associated with tsunamis. Japan tsunami March 2011 is well documented with extensive video and photographs. Indian Ocean ('the Asian Tsunami') Dec 2004.	6(b)

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
				Japan earthquake map: video reports: www.bbc.co.uk/news/world-asia-pacific-12722187
3.2 Hazardous environments resulting from mass movements	To understand the causes and characteristics of hazardous mass movements To understand the difficulty of prediction and the variations in impact and human responses	**Flow** **Slide** **Fall** **Avalanche** **Rotational slip**	**Slope processes** Revision of theoretical work covered in Paper 1 Physical Core Unit 3.3 (slope processes and development). Focus for this unit should be on hazardous nature of the activity, especially management. This section may be short because foundations were laid in the AS course and case study material has been covered already. **Causes of mass movements:** **1. Physical –** Idea of downslope movement of material under the influence of gravity. Relationship between internal strength of, and external stress on, weathered material on a slope. **2. Human** mismanagement. **Nature and speed of the movement** Classification of processes: flows, slides and falls. Speed of flows; mixed lithology – rotational slip. **Landslides and mudflows**	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 274–281 includes case studies. Section 3.2 Activities Pages 276, 277 and 278 Figure 3.23 Page 279 shows Classification of Avalanches Figure 3.24 Page 276 shows Avalanche Impact

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
			Lahars link to previous section – volcanic activity. Link to river flooding. **Avalanches** will be new material. Nature of avalanches: slab-dry and snow-wet. Causes: conditions for avalanche formation. Precaution, prevention, control. Avalanches as hazards: human responses. **Case studies** will illustrate the above main points: Vaiont Dam, Italy; Aberfan, South Wales 1966; Holbeck Hall, Scarborough, UK. **Note:** This section may appear short. This is for two reasons. 1. The theoretical side of the section on processes may have been covered in the AS Physical Core, Rocks and weathering 3.3 and 3.4 (to some extent). 2. The case study material may also be linked closely to section 3.4 in this syllabus, the sustainable management of a hazardous environment resulting from mass movement.	CyberSpace Avalanche Center: www.csac.org Geo Factsheet Number 143 Avalanches January 2003 Geofile Number 435 September 2002 Avalanche Management National Hurricane Center: www.nhc.noaa.gov **Past papers** November 2011 Question 6(a) June 2007 Question 5(a)
3.3 Hazard resulting from atmospheric disturbances	To understand the distribution, causes and characteristics of tropical cyclones and tornadoes	**Tropical storm** **(Tropical) Cyclone** **Hurricane** **Instability** **Latent heat**	**Tropical storms (cyclones)** **Definition** **Classification** Hurricanes, cyclones and typhoons. **Location** Map to show global location and areas most at risk.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 282–289

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	To understand the difficulty of prediction and the variations in impact (and associated phenomena) and human responses	**Adiabatic** **Cumulo-nimbus** **Tornado**	**Formation** Conditions for formation. Understanding of processes of instability, adiabatic changes of temperature, release of latent heat. Link to AS Unit Atmosphere and weather 2.1 and 2.2. **Weather conditions** High winds, heavy rainfall and storm surges may result in flooding and landslides. Link to hazardous nature of the physical event. The weather elements and the way in which they are hazardous are important. Cross section of a tropical storm - fully labelled and annotated. **Magnitude and frequency** These hazards have considerable potential to damage life and property. Location may be an important factor – e.g. barrier islands of the eastern seaboard of the USA. **Prediction** Arguably tropical storms and tornadoes are the most predictable of all these physical events. Forecasting technology, seasonal pattern of the storms. However it is notoriously difficult to guarantee track and speed of movement. Reminder about distinction between forecasting and prediction. **Precaution** Evacuation, protection: coastal and river defences against flooding, drills, land use planning/zoning. Insurance, perception of the risk. **Two contrasting case studies** one in an MEDC, one in an LEDC. Hurricane Isabel Autumn 2003 – eastern seaboard of the USA. (Other well documented ones are Gilbert and Andrew) and Hurricane Mitch 1998 – Central America. The causes and secondary effects, e.g. storm surges, high winds, coastal flooding should be highlighted as these are specifically	Figure 3.29 Page 283 shows Distribution of Tropical Storms Figure 3.28 Page 282 shows the Formation of a Tropical Storm Section 3.3 Activities Pages 285 and 289 Geofile 516 April 2006 Hurricane Katrina Geofile 530 Sept 2006 Hurricanes Rita and Katrina and the after effects Geofile 500 Sept 2005 Hurricane Season in the Caribbean Resources for learners, schools and teachers: www.curriculum-press.co.uk Geo Factsheet Number 162 Hurricanes: A

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
			mentioned in the syllabus. The impact of the storm and the response to the event should be emphasised. Population densities, perception of the risk and contrasting levels of empowerment to control the environment, can be highlighted in the contrasting choices. Recent examples: Cyclone Nargis, Irrawaddy delta, Burma May 2008. Useful because of the political implication of the rescue and management of the aftermath. **Tornadoes** **Definition** A tornado is a short-lived, violently rotating, narrow, funnel-like column of cloud that reaches the ground from a cumulo-nimbus cloud. It is associated with intense low pressure conditions. **Formation** **Measurement of magnitude –** Fujita Tornado scale.	Predictable Hazard? Images of tornadoes: www.chaseday.com/tornadoes.htm . Frequently asked questions about tornadoes: www.spc.noaa.gov/faq/tornado World Meteorological Organization: www.wmo.ch Geo Factsheet Jan 2006 192 Tornadoes **Past papers** June 2011 Question 3 June 2009 Question 6
3.4 Sustainable management in hazardous environments	To acquire in-depth knowledge and understanding of contrasting hazardous environments,	**Multiple Hazard Zone**	Case studies incorporated at each stage will fulfil the requirements for this section of work. Therefore a separate section may not be needed. **General guidance on case studies:** 1. Knowledge of the cause and nature of the event and its	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 289–300

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	focusing on: • location – use of sketch maps • the hazard or multiple hazards • the strategies employed to predict and reduce impact (manage the hazard) • the relative success of those strategies (i.e. positive and negative aspects)		location is fundamental. In the case of tectonic hazards, the nature and location of the plate boundary is essential. 2. The information should be focused under side headings. 3. Annotated maps and diagrams which are reproducible in examination conditions are ideal. 4. Factors that influence the impact of the hazard -physical, economic, social, political. Discussion and awareness of causes and factors that influence magnitude and response are important, e.g. nature of the underlying material in an earthquake can magnify the event. Political tensions may potentially influence availability of aid, e.g. Iran 2003. 5. Time scale i.e. short term and long term view of factors and impacts should be considered. Link made between the physical event and the human response.Case studies which contrast an MEDC with an LEDC provide useful material for discussion of human response to the physical event. Evaluation of the impact in terms of magnitude and timing of the physical event, preparedness, precautionary measures, prevention and control measures need consideration. e.g. hard engineering schemes. More sustainable precautionary measures, impact on the landscape/environment. Reality of accurate prediction in the future. Importance of technological fix. Management of the hazard after the event and preparation for the next hazardous event, e.g. Montserrat 1995 or impact of Mt Pinatubo on global climate. Multiple Hazard Zones could provide a useful vehicle for this section, e.g. California, Iceland, New Zealand. Local examples are always preferable, if applicable.	See case study of the Bam earthquake, Iran, December 2003. Geo Factsheet September 2002 Number 137 West Sussex: A Multiple Hazard Zone? **Past papers** November 2011 Question 6(b) June 2009 Question 5(b) November 2009 Question 5(b)

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
			Learners are expected to cover a range of hazards and be able to appreciate the human responses and management strategies, as well as the impact of the physical event itself, e.g. timing, location and scale of the event. Kobe 1995 would be a useful example. China 2008, 7.2 on the Richter scale, was interesting because of primary and secondary impacts. Learners should be aware of long term effects not always obvious at the time. These include psychological trauma; loss of family members, possessions and livelihoods; economic effects. Some questions focus on the prediction and management of hazards/hazardous environments. Case studies of contrasting environments and levels of economic development serve to illustrate answers very well.	

Paper 2 Physical options – Unit 4: Arid environments

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
4.1 The distribution and climatic characteristics of hot arid and semi-arid environments	To understand the causes of aridity, low (seasonal) rainfall and the reasons for unreliable rainfall. This understanding to be related to distribution and other climatic characteristics	**Arid** **Semi-arid** **Hadley Cell** **ITCZ** **Continentality** **Pleistocene** **Pluvial**	**Introduction** **Definition** of arid and semi-arid. Traditional criterion: annual rainfall amount Arid: less than 250mm per annum (year) Semi-arid: 250–500mm per annum (year) Definitions now use P:PET ratios (Precipitation:Potential EvapoTranspiration) and the aridity index. Arid: 0.03–0.2mm P:PET ratio Semi-arid: 0.2–0.5mm P:PET ratio In semi-arid areas rainfall may vary up to 40% above or below the mean. Aridity index: –100 (areas with no precipitation (ppt)) 0 (areas where P=PET) +100 (areas where P>PET). Arid areas are between -40 and -100 and semi-arid areas are between -20 and -40. Global distribution of hot deserts. World map is an ideal teaching aid. **Distribution** • Latitude (high altitude deserts within the area) • West coast – influence of cold ocean currents, e.g. Humboldt, Benguela currents • Continental interiors **Characteristics of an arid climate**	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 301–307 Geo Factsheet 24 The Causes of Aridity Figure 4.1 Page 301 shows Global Distribution of Arid Areas Figure 4.3 Page 303 shows the Causes of Aridity Table 4.3 page 305 shows *Climate Data for some Arid Cities* **Past papers** November 2011 Question 7(a) November 2010

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	To understand that arid and semi-arid regions today have had different climates in the past and that this affects current landforms and water availability		Temperatures: annual, diurnal range, rainfall annual amounts, variability, convectional rainfall, flash floods P:E ratios. Rainfall reliability, water availability, effective precipitation, soil moisture budgets, albedos. High wind energy environments. **Causes of aridity** 1. Descending limb of Hadley cell, related winds. (Seasonal movement of the thermal equator – ITCZ) relate to latitudinal distribution, e.g. Sahara desert 2. Offshore ocean currents, relate to global distribution map, e.g. Namib desert 3. Rain shadow areas, relate to continental interiors and high mountains, e.g. Andes Patagonia, Rockies 4. Continentality, e.g. Gobi desert **Past climates** Climate change – Pleistocene period – continental ice sheets in Northern Hemisphere. 'Pluvials', wet periods – result of migration of wind and pressure belts south. Therefore North Africa influenced by mid-latitude rainfall and southern edge of Sahara migrated into the savannas. i.e. weathering, erosion and landforms. Archaeological evidence should be separated from geomorphological evidence.	Question 7(a)
4.2 Processes producing desert landforms	To understand the processes of weathering, erosion, transportation and deposition in arid and	**Hortonian overland flow** **Perennial** **Ephemeral** **Aquifer**	Emphasise link between process and form throughout, also link back to climate in 4.1 and link to hydrological regimes, which could be the starting point here, because the topic straddles climate and landforms.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 307–314

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	semi-arid environments and their effect on landforms	**Exfoliation** **Salt weathering** **Frost shattering** **Hydration** **Block disintegration** **Granular disintegration** **Pedestal rock** **Yardang** **Zeugen** **Deflation** **Barchans, seif (linear), transverse and star dunes** **Wadis** **Alluvial fans** **Arroyos** **Pediments** **Piedmont zones** **Bahadas** **Salt lakes** **Playas** **Inselbergs** **Pediplanation** **Pedimentation**	**Desert environment hydrology** Water flows and stores, groundwater, predominance of Hortonian overland flow because rainfall intensity invariably exceeds infiltration capacity. Hydrographs, water budgets. Brief mention of perennial and ephemeral water courses, surface stores, oases, playa lakes, exotic rivers with seasonal flows. Wadi flows. Groundwater stores. Aquifers, fossil groundwater. Should make links with human activities e.g. semi-arid areas like the Sahel in 4.4. Water availability, tapping of groundwater supplies – wells, etc., irrigation. **Processes –** Throughout there has to be discussion about these processes, the extent to which they dominate arid areas and the factors that influence the processes. **Weathering** **Physical – Exfoliation –** conductivity of rocks, coefficients of expansion of different mineral of different sizes and colours. Peeling of surface layers of rock – curvilinear sheets. May be aided by dilatation/pressure release. Relate to diurnal range of temperature. Link to water – episodic rainfall, upward capillary movement of water as a catalyst of the process. Exfoliation domes, bornhardts, in semi-arid areas. **Salt weathering** **Frost shattering** in high altitude deserts. **Chemical** – limited because of lack of water but present. **Hydration** especially in arid areas. Greater chemical weathering in semi-arid areas due to greater vegetation cover producing organic acids to facilitate processes. End products of weathering. **Block and granular disintegration** – link back to the process.	Section 4.2 Activities Pages 309 and 311 Figure 4.8 Page 208 shows Wind Erosion Figure 4.9 Page 310 shows Sand Dune Types Figure 4.14 Page 313 shows Desert Landforms Excellent images of the landforms: www.geoimages.berkeley.edu **Past papers** June 2011 Question 7 November 2011 Question 8(a) June 2010 Question 8 – Figure 4 is useful resource

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
			Erosion, transportation and deposition – by the agents wind and water Link to landforms at every stage. **Erosion** – abrasion, deflation. **Transportation** – suspension, saltation, traction. **Deposition** **Erosion and transportation –** chief agent wind. Process of abrasion – produces mushroom or pedestal rocks. Discussion about role of wind, transportation of sand particles. Concentration within a metre or less of the surface. Changing view, it is now thought that the role of water and chemical weathering is important. Yardangs and zeugen can be mentioned but structure as well as wind may be an influential factor. **Deflation –** erosion of sand to produce deflation hollows. Dimensions large – other factors –structural and then chemical processes once the hollow has reached the water table. **Deposition –** sand dunes. Reasons for deposition, reduction in wind velocity, initiator of velocity reduction – changing gradient of the surface (an obstacle), changing atmospheric conditions. **Variety of form according to local conditions** Barchans, seif (linear), transverse, star, etc. Annotated diagrams are an ideal way to present the description of these landforms. **Specified landforms** Wadis, alluvial fans, arroyos, pediments, piedmont zones, bahadas, salt lakes, playas, inselbergs. A diagram is ideally suited. Landforms produced due to the action of water Wadis and arroyos – flash-floods, relate to discharges and relative importance of erosion, amount of load and debris removal.	

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
			A typical desert profile – mountain front with embayments, knick, pediment with veneer of alluvial material, bahada (peripediment), playa. **Evolution of the profile –** theories of formation **Pediplanation** To include parallel retreat of slopes (scarp retreat) and pedimentation, i.e. the formation and extension of the pediment. Theories of pedimentation: (i) An erosional feature as the result of lateral planation by stream and sheet floods (ii) the possible role of the pediment as a transportational slope. Discussion of scarp retreat as the result of weathering and formation of a boulder controlled slope which retreats parallel to itself over time, thus extending the pediment, as opposed to the undercutting of the mountain front by lateral corrasion. Relate the theories to the form of the desert cross profile e.g. the slightly concave pediment seems to indicate the action of running water. Residual masses of mesas, buttes, inselbergs. These masses represent different stages in the evolution of pediplanation. Importance of climatic change in the evolution of desert landforms – pluvials, wetter period coincidental with the glacials of the Pleistocene –movement south of mid latitude rainfall, southern extension of the desert into the savanna. Evidence for climate change ranges from geomorphological to geological to archaeological. Link to 4.1.	
4.3 Soils and vegetation	Introduction to the concept of an ecosystem.	**Biodiversity** **Trophic level** **Biomass** **Biomass**	Functioning and structure of the ecosystem Productivity – NPP nutrient cycling. Low biomass productivity. Biodiversity, trophic levels/food chain. Fragility/resilience: two theories – fragile because food chains are simple or resilient because the	*Cambridge International A and AS Level Geography* (Nagle and Guinness)

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	To understand the characteristics of and processes within arid and semi-arid vegetation and fauna To understand the factors affecting soil formation and characteristics To understand the causes, effects and possible solutions to	**productivity** **Capillary action** **Salinisation** **Solonchak** **Solonetz** **Duricrust** **Desertification** **Soil degradation**	organisms are highly adapted. **Vegetation –** Characteristics and adaptations to high temperature and drought and salinity in soils and soils generally, shallow and nutrient deficient. Distinguish between physical and physiological drought. Adaptations of plants to aridity: - strategies to reduce water loss - strategies to maximize water take-up - strategies to reduce overheating - strategies to reduce reproduction in times of adverse conditions **Animals –** Characteristics and adaptations to food shortages, high temperature and drought **Soils –** Evaporation is greater than precipitation therefore there is upward movement of water by capillary action. Halomorphic/saline soils – process of salinisation, i.e. evaporation of water to produce saline crusts. **A typical desert soil** – shallow, grey, saline and nutrient poor. Discuss learners' expectations of desert soils and reasons. Soil formation processes including salinisation Solonchaks, solonetz, solod, important to appreciate and account for the variations. Creation of duricrust. **Desertification** Causes of desertification – human activity or natural causes: opportunity for individual research of factors and class debate. • overcultivation	Pages 314–322 Figure 4.15 Page 314 shows Model of Nutrient Cycling in a Desert Figure 4.16 Page 315 shows Plant Adaptations to Drought Figure 4.17 Page 317 shows a Model of Desertification 'Plant distribution in the Sonoran Desert' Jane Dove *Geography Review* Nov 2001 pp.10–13 Excellent source. Other resources for Desertification are included in 4.4. **Past papers** June 2011 Question 8(a) November 2011 Question 7(b) November 2011 Question 8(b)

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	desertification and soil degradation		• overgrazing • deforestation • population changes including migration • climate change • others Case study – Sahel is a classic example and there are good examples in China. **Soil degradation** Causes of soil degradation – human activity or natural causes: opportunity for individual research of factors and class debate. (May be linked with desertification but they are distinct.) Links well with salinisation especially where excessive irrigation used. Natural causes made worse by human activities leading to soil erosion soil exhaustion etc in fragile environments. Once causes and the intricate inter-relationships are understood, learners to devise ways of overcoming some of the issues.	June 2010 Question 7 November 2010 Question 7(b)
4.4 Sustainable management of arid and semi-arid environments	To acquire in-depth knowledge and understanding of **one** tropical environment, focusing on: • Its location – use of sketch maps • The issue affecting sustainability • the strategies employed to increase sustainability • the relative success of	**Sustainability**	One possibility is a case study to include problems of desertification and its management in a sustainable fashion and possibly water supply and the management of that supply. It should illustrate some of the problems of the physical environment and relate these to human activity and the ways in which the problems of rainfall reliability and drought have been overcome, e.g. dams and reservoir schemes, tapping of groundwater supplies, tube wells, irrigation. The process of desertification, typical of the arid margins (semi-arid areas like the Sahel in sub-Saharan Africa) is a useful vehicle for discussion of the combination of physical factors (lack of rainfall) and human activities responsible for environmental degradation and the need for sustainable measures.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 323–226 Geofile Number 446 Drought and Desertification in India and Pakistan April 2003 *Drought response in southern Zambia*

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	those strategies (i.e. positive and negative aspects)		Possible case studies include: • **Gezira Irrigation scheme Sudan** • **Tunisia –** water management • **Drought in Zambia** • **Nile Valley** – the best documented example in accessible texts • **Drought in the semi-arid Sahel** (sub-Saharan Africa) Online information is readily available if key words are put into the search engine. **Note:** It is essential to have one case study that deals with the issue of desertification.	Richard Byrne *Geography Review* Jan 2000 pages 22–24 *Water Management in Tunisia* Woodland and Hill *Geography Review* Sept 2001 pages10–14 *Desertification in Southern Africa* Thomas and Dougill *Geography Review* Nov 2003 pages 24–7 Geofile 339 Desertification Desertification: www.un.org/ecosocdev/geninfo/sustdev/desert.htm Geo Factsheet 28 Desertification: Causes and Control Geo Factsheet 191 Soil Degradation: A Creeping Concern? Geo Factsheet 199

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
				Water Issues in the Middle East General websites on deserts with images and factual information: www.tooter4kids.com/Desert/sahara_desert.htm www.oxfam.org.uk/coolplanet/ontheline/explore/nature/deserts/deserts.htm www.geo.ua.edu/intro03/wind.html www.earthobservatory.nasa.gov/Newsroom/New Images Excellent photos at: www.geog.nottingham.ac.uk/~michele/research/geomorphology/sand.htm http://pubs.usgs/gip/deserts/dunes

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
				www.geo.arizona.edu www.terragalleria.com/arizona/monument-valley/picture Cactus plants: www.rivenrock.com An essay on the Gezira Irrigation scheme: www.courseworkbank.co.uk www.wadmedani.com/english/gezira_scheme.htm **Past papers** June 2011 Question 8(b) November 2010 Question 8(b)

Paper 3 Human Options – Unit 1: Production, location and change

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
1.1 Agricultural systems and food production	To understand the concept of an agricultural system	**Land-use** **Arable** **Pastoral** **Subsistence** **Commercial** **Land tenure** **Irrigation** **Export production** **Extensive** **Intensive** **Productivity** **Inputs** **Outputs** **Throughputs** **Subsystems**	Introduce the idea of classifying agricultural production systems and the basis for classification. Idea of inputs, outputs and throughputs. A blank systems diagram could be filled in by learners as each input, output and process is referred to. This would help to reinforce the links between each.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 327–339 including case studies Figure 1.9 Page 332 shows the Agricultural System **Past papers** June 2009 Question 1 June 2010 Question 1 November 2008 Question 1(a)
	Knowledge and understanding of factors affecting agricultural land use and practices	**Intensification** **Extension of Cultivation**	Main factors to be covered are **physical** (land/relief, soil, climate, hazards), **social** (e.g. population pressure, cultural practices, inheritance laws, education, health), **economic** (e.g. motive, money/capital, labour force, distance from market), and **political** (e.g. government policy, NGO assistance, aid, debt). Think about **positive and negative** factors. Classification is essential. The basic principles underlying the Von Thünen model may be introduced, but there is no need to learn the model in detail. It is important to link it to intensive and extensive farming systems.	
	Study of examples of intensive and extensive agricultural production	**Extensive** **Intensive** 1. Arable system	Two case studies: It may help learners if the cases chosen are accessible to them from their own context or home country. Other possible case	

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
		2. Pastoral system	studies include for 1. Intensive wet rice cultivation and for 2. Dairying.	
1.2 The management of agricultural change	To understand the nature of agricultural change – intensification of production and extension of cultivation The syllabus requires a case study of one country at two different scales: To understand agricultural change at the scale of the holding or producer To understand agricultural change at the national scale	**Agricultural change** **Innovation** **Agricultural development** **Agricultural reform** **Agricultural extension** **Biotechnology** (Link to AS Unit 1.3 Population-resource relationships) **Irrigation** **Agribusiness** **Diversification**	Agricultural change may occur as a result of government policy or because of external factors such as population pressure, profit motivation or climate change. Modern technology has introduced controversial methods such as GM crops. Alternatives include organic farming. The choice of case studies ideally should be as local and familiar as possible. In a global economy, farmers are affected by external factors. In MEDCs farmers are exploring alternatives to intensive farming. It is important to stress the difference between increasing yield per hectare and increasing land area under cultivation. Both strategies are possible, but may not go hand in hand, one or the other may be the preferred option depending on the location. Teaching should focus on the need for change, difficulties in bringing about change, management issues and evaluation of attempted solutions. Possible case studies – agricultural change in South Africa or in Eastern Europe.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 339–345 Geo Factsheet 75 Sept 1999 Climate Change and Vegetation Geofile 541 April 2007 The Globalisation of Food Production Various farming issues: www.defra.gov.uk/ Linking environment and farming: www.leafuk.org Geo Factsheet 105, January 2001 The Crisis in British Farming **Past papers** June 2011 Question

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
				1(b) November 2011 Question 1(b)
1.3 Manufacturing and related service industry	To understand the reasons for industrial location	The factors of production (land, labour, capital, markets) Physical factors e.g. relief, site, raw materials Economic factors e.g. labour supply, capital, transport, communications Political factors e.g. government policy, instability	The differences in location factors for old "heavy" industries such as steel or shipbuilding compared to modern "light" or "footloose" industries could be a useful starting point. This could be stimulated by two locational diagrams. Simulation exercises can be very useful here. They can be produced imaginatively by the teacher therefore as many variables as desired can be built in. Consider the relative roles of the various factors and link factors to productivity. The theories of Weber, Lösch, Smith (spatial margins to profitability) and the Product Life Cycle model could be presented to the learners in a comparative form, perhaps with sufficient discussion to ensure that the concepts behind them are understood. **Note:** Learners do not need to be able to draw or recall the content of the models and theories, but should be able to interpret a diagram based on one of the above. **Optional extension study –** Models and theories of industrial location. These are not specified in the syllabus therefore it is possible to omit. The decision can be individual and may depend on available time.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 345–355 Section 1.3 Activities Pages 346, 348 and 350 Figure 1.26 Weight Loss Diagram Page 345 Figure 1.29 Transport Costs and Distance Page 347 Figure 1.32 Economies and Diseconomies of Scale Page 349 Geo Factsheet 172 The Challenge of Globalisation Geo Factsheet 198 Global Trends in FDI

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
				Geo Factsheet 161 The Global Shift Geo Factsheet 94 April 2000 Research & Development Parks **Past papers** June 2011 Question 2(a) November 2011 Question 2(a) June 2010 Question 2(a) November 2010 Question 2
	To study the processes leading to industrial change, growth and development: agglomeration and linkages	**Agglomeration** **Functional linkages:** **Horizontal linkage** **Vertical linkage** **Forwards linkage** **Backwards linkage** **Industrial inertia** **Economies of scale** **Diseconomies of scale** **Globalisation** **Global shift**	The emphasis needs to be on • Character • Location • Organisation • Productivity The location factors have changed over time due to factors which include new technology and competition. Case studies of industrial change could be introduced, such as global shift in the steel industry. Looking at past questions does indicate areas of the syllabus that need attention to detail. Case study 1 – Industry in Maharashtra, India	

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	To understand the character, and reasons for the development, of industrial estates and export processing zones (EPZs)	**Foreign direct investment (FDI)** **Industrial estate** **Export processing Zone (EPZ)**	Case study 2 – Industrial development in South Korea Case study 3 – High-tech industry in the UK Case study 4 – The US manufacturing belt Case study 5 – The Rise of the Pacific Rim Cover advantages and disadvantages of EPZs and industrial estates in detail. Case studies need to be compared and consolidated. Learners should look for similarities of approach in the successful countries. Examples could be mentioned from Mauritius, China, Mexico and much of SE Asia.	
	To learn about the importance of the informal sector (manufacturing and services)	**Informal sector** **Manufacturing industry** **Service industry**	In the economies of many LEDCs, a large informal sector exists. The informal sector is often associated with those who migrate from rural areas to urban areas who live in informal housing. Unable to find work in the formal sector, they find, or create, work in the informal sector. Definition of the informal sector: • Characteristics • Materials used • Profile of the labour force • Location(s) • Lack of regulation	examples may also be able and should be used e possible.

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
			Consider how the informal sector may or may not be a springboard for industrial development or future employment. Dynamism of the sector.	
1.4 The management of industrial change	To understand the basis of industrial policy in *one* country To evaluate the success of the policy	**Industrialisation** **Deindustrialisation** **Reindustrialisation** **Regional disparities** **Development zones** **Enterprise zones** **Business parks** **Science Parks**	Governments try to control and develop their resources by planning industrial development. It is useful to study policy priorities (type of industry, location), changes in policy over time and difficulties or issues in industrial change in the chosen country. Case study 1 – the industrial and economic development of Singapore Case study 2 – Spatial changes in China's industrial structure Case study 3 – Industry in the North East of England **Note:** Evaluation is a crucial aspect of the case study as it tests learners' higher order skills.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 355–360 Case Study of India Geo Factsheet 154 Structural Change in the Ruhr (Germany) **Past papers** June 2011 Question 2(b) November 2011 Question 2(b) June 2010 Question 2(b)

Paper 3 Human options – Unit 2: Environmental management

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
2.1 Sustainable energy supplies	To understand the differences between renewable and non-renewable energy resources	**Sustainability** **Renewable energy** **Non-renewable energy** **Energy budget** **Fossil fuels** **Hydro-electric power (HEP)** **Solar energy** **Biofuels** **Tidal power** **Wind power** **Nuclear power** **Technology**	**Classification of resources:** renewable and non-renewable. Facts and statistics for energy use can be taken from an atlas. Analysis of trends in use of energy should be a starting point e.g. energy demand and supply in a country in 2005 and 2020. It is important that there is detail about each of the sources of energy in this section. Focus on a particular source of energy – requirements for production, location, contribution to energy budget, etc. Suggested case studies: USA – energy alternatives for the future Wind farms in Europe – a topical issue	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 361–374 covers Section 2.1 Geo Factsheet 76 Sept 1999 – Geothermal Energy Includes items on nuclear energy and the greenhouse effect: www.uic.com.au/education.htm **Past papers** Section 2.1 Questions: November 2011 Question 3(a) June 2010 Question 3(a) November 2010 Question 3
	To understand why levels of supply and demand for energy	**Demand** **Supply** **Resource**	This section is focused on supply and demand and the relationships between them.	Table 2.1 Page 362 shows Factors Affecting the Supply of

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	resources vary at the national level	**endowment** **Technology** **Energy gap** **Factors that influence energy policy** e.g. level of development, capital, energy policy, environmental concerns, Kyoto targets, etc.	Maps and statistics can be studied to show that the main producers of energy are not necessarily the main consumers. Local case studies are encouraged and often highly effective.	Energy
	To examine trends in the patterns of energy consumption in LEDCs and MEDCs		A good starting point is graphs and data. Relate to changes in technology. Trends in consumption.Comparison of statistics for present demand/ supply and future demand/supply, e.g. for 2005 and 2020. Possible comparison of LEDCs and MEDCs. This could be picked up as part of the case study (2.2).	Figure 2.7 Page 372 shows Primary Energy Consumption
	To understand the environmental impact of energy production, transport and usage at the *local* scale	**Environmental impact** **Natural environment** **Pollution** **Degradation** **Conservation**	All energy production has some environmental impact (including renewables). Fuel extraction and electricity production create industrial waste, transport may spill crude oil, etc. This can be demonstrated by use of case studies e.g. Exxon Valdez oil spill or the Trans-Alaska pipeline which has great effects on the natural environment. Nuclear energy has distinct actual and potential impacts locally which may impact wider areas e.g. Chernobyl. **Note:** Impact on people (human impact) is not needed.	Global warming: www.iclei.org Other links on this website explore alternative energy sources and their effects.
	To understand the environmental impact		Data of carbon dioxide emissions and levels of deforestation can be analysed, considering ‘Carbon sinks’, and a	www.uic.com.au/education.htm

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	of energy production, transport and usage at the *global* scale		link made to Tropical environments, Physical Options Unit 1. Could compare burning fossil fuels with nuclear energy, which may be seen as "clean" but has other possible dangers.	deals with Australian uranium *Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 373 and 374 offer case studies
2.2 The management of energy supply	To examine and evaluate the supply of electrical energy in *one* country at *two* scales 1. Overall energy strategy (national) 2. Named, located energy scheme (local)	**Demand** **Supply** **Energy gap** **Production** **Location**	One case study is sufficient as long as it covers both scales, e.g. of Zimbabwe and Kariba (HEP). Teachers may develop more than one case study, e.g. the home country and a contrast (LEDC or MEDC). It is anticipated that the scheme studied will be from the same country as the strategy, to offer greater detail and depth.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 374–378 Case Study of China **Past papers** November 2011 Question 3(b) June 2010 Question 3(b) Geo Factsheet 95 April 2000 UK Energy – Update
2.3 Environmental degradation	To understand the nature and causes of the many types of pollution To distinguish	*Environmental degradation* **Land pollution** **Air pollution** **Water pollution**	Industries in all four sectors can pollute land, air and water. Definition, classification and causes and sources of pollution as an introduction. Can use spider diagram to brainstorm the topic. Add water as a resource to the discussion. Could link to AS Unit 1 Hydrology through water quality, abstraction, etc. Could Physical	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 378–392 cover Section 2.3

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	pollution from environmental degradation	May also include: **Noise pollution** **Visual Pollution**	Options, Unit 4 Arid and semi-arid environments.	**Past papers** June 2010 Question 4(a) November 2010 Question 4
	To analyse the factors which have led to degradation of *rural* environments Causes and consequences of misuse or overuse of rural land	**Population pressure** **Soil erosion** **Land degradation** **Deforestation** **Desertification** **Poor farming practices**	Degradation of rural environments occurs in both MEDCs and LEDCs. Suggested case study from home country or any context which learners can readily understand.	Question 4 November 2011– Land Degradation
	To examine and evaluate policies designed to improve the quality of degraded rural environments	**Reclamation** **Land reform** **Soil conservation** **Afforestation** **Environmentally Sensitive Areas (ESAs)** **Waste disposal**	Case study – Basilicata, Italy, is a very good, up-to-date case study to use.	www.desire-his.eu/es/descargas/doc_view/322-highlight-conclusions-rendina-study-site Rendina study site, Basilicata, Italy
	To understand the relative success or failure of policies designed to address urban environmental degradation	Urban regeneration Urban redevelopment	Case study 6 – inner city areas Case study 7– São Paulo, Brazil Case study 8 – London Docklands Case studies are a matter of individual choice.	Geo Factsheet 121 January 2002 Urban Problems in Rio de Janeiro

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	Knowledge of risk factors affecting environments, environmental protection policies and their impact	Examples may include: **National Parks** **Nature reserves** **Mining agreements** **Tropical rainforest (TRF)** **Ecotourism** **Earth summits** **Kyoto protocol** **CO_2 emissions targets**	Identifying: **Risk factors**: general risk factors e.g. population pressure and specific risk factors (to time and/or place) e.g. road building project. Awareness of the need for some form of environmental protection. **Measures**: proposed or taken. **Outcomes**: relative success/failure. Unexpected effects, further needs, etc. Study of the Earth summits of Rio de Janeiro 1996 and Kyoto 1997 and the targets of the Kyoto Protocol. Possible link back to AS Unit 2 Atmosphere and weather, 2.4 The human impact	
2.4 The management of a degraded environment	To acquire detailed knowledge of *one* degraded environment	Factors that cause and influence degradation: economic, social, environmental, political. Positive and negative.	This section may be covered by reference to any case study of a teacher's or learner's choice. Factors, causes, problems, issues, management strategy, attempts or initiatives, and relative success or failure are the key elements. **Note:** Ensure that the chosen case study has all the attributes needed. It is advisable to check the wording of past questions in order to select a case study that fulfils the question requirements.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 392–396 Geo Factsheet 91 April 2000 Cardiff Bay Redevelopment, UK **Past paper** June 2007 Question 4(b)

Paper 3 Human options – Unit 3: Global interdependence

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
3.1 Trade flows and trading patterns	To examine the nature of global patterns of trade	**Imports** **Exports** **Flows** **Patterns of trade** **Balance of trade**	This topic could be introduced by reference to an atlas and the use of world outline maps.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 397–408 covers Section 3.1 **Past papers** Section 3.1 Questions: November 2011 Question 5(b) June 2010 Question 1 November 2010 Question 5
	To understand why current trade patterns have been influenced by past events Factors affecting global trade	**Trading bloc** **Visible imports/exports** **Invisible imports/exports** **Product life cycle** **Protectionism** **Resource endowment** **Locational advantage** **Trade agreement** **World Trade**	World trade is organised into trading blocs, based mainly on economic or historical associations. This topic could be introduced by using a matching exercise with the various blocs' acronyms e.g. ASEAN, and their definitions – see map in Waugh p.560 Suggested case studies: NAFTA, OECD and GATT. Learners can explore economic, social, environmental and political factors. It helps to identify short term and long term changes and internal and external factors.	Geo Factsheet 117 Sept 2001 The North American Free Trade Agreement (NAFTA)

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
		Organization (WTO)		
	To appreciate the nature of recent and current changes in global patterns of trade	**Tiger economies** **Pacific Rim economies** **NICs** **RICs** **BRIC**	Global trade has been influenced strongly by the rise of the NICs and of the Pacific Rim countries.	
	To understand the role of innovation in changing trading practices	**Freeports** **Fair trade** **Ethical trade**	Free ports encourage trade to develop, e.g. Manaus, Brazil. Should study the issues surrounding fair trade. Definition. Who benefits? Why? Negative and positive outcomes in both MEDCs and LEDCs. Issues of tariffs, child labour, unfair/comparative advantage. Recent publicity in MEDCs. Many products are now available as fairly traded items. Role play can be used to explore the perspectives of producers, consumers and middlemen. Learners could find one product which is fairly traded and/or one which is unfairly traded and write a profile to present to the class.	The best source of information is from company websites. TV programmes e.g. Channel 4 Dispatches programme *Blood Sweat and T-Shirts*. Available on DVD: http://planetgreen.discovery.com/tv/blood-sweat-tshirts/ A good magazine source is NEW Internationalist. It has a left wing political bias and is informative for the whole unit. Geo Factsheet 163 The Way Ahead for Burkina Faso.

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
				New Internationalist: www.newint.org
3.2 Debt and aid and their management	Aid and debt as concepts Distribution of aid Appreciation of organisations and institutions that distribute aid Factors that influence aid donation Advantages and disadvantages of aid donation for recipient and donor countries	**Aid** **Types of aid** **Bilateral aid** **Multilateral aid** **Emergency aid** **Relief aid** **Development aid** **Tied aid** **Short and long term aid** **Debt** **Donor country** **Recipient country** **Aid agencies** **World Bank** **IMF** **NGOs** **Charities**	Some of these overlap. A brainstorming session, spider diagram or family tree to distinguish could be useful. Expand to include definitions and examples which are essential for full answers. At some stage it would help to hold a class discussion or debate about the relative merits of **trade versus aid and debt**. It may be sensible to mention this early on, so learners make the link back to trade. Consider the topic in relation to donor and recipient countries. Distribution and direction of aid globally. Compare with trade and with GDP map of development (the indices are closely connected). Aid as grants. Aid as loans which lead to debt, i.e. debt as an outcome of aid donation. Capital projects for development. e.g. HEP schemes. A critical appreciation of aid in terms of its impacts on receiving countries (e.g. positive/negative; short-term and longer term; spatially).	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 408–418. Includes case study of Water Aid in Mali. Figure 3.25 page 413 shows Cycle of Poverty Figure 3.26 Page 413 shows Different Types of International Aid. Section 3.2 Activities Pages 412 and 418 **Past papers** June 2011 Question 5 June 2011 Question 6(a) November 2011 Question 5(a)

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	Advantages/disadvantages of the different types of aid. Factors that influence aid donation economic, social political e.g. Oil crisis 1973 Aid and debt			
	Appreciation of debt Appreciation of debt relief/cancelling of debt Causes Nature Problems	**The Millennium Development Goals (MDGs)** **Debt cancellation** **Debt crisis** **Debt relief** **Lobbying and pressure groups** **G8 Summits**	Since 2005 the issue of debt cancellation has arisen at the G8 summits, e.g. held at Gleneagles, Scotland, 2005. Follow the arguments. Crippling debt and inability to even pay back the interest on the debt means that LEDCs are unable to invest in development and so endure poverty, etc. There are many ways to tackle this topic but it lends itself to debate, discussion and evaluation. It must be rooted in factual knowledge. The resources should help although many are not available in textbook form and require imaginative research. The scale needed is *national*; a study of a single country would give depth, with other examples as contrast and to ensure that all the issues are covered.	UN Development Report on MDGs 2005 New Internationalist Oct 2005, excellent articles on NGOs. Geo Factsheets 186 MDGs 78 Third World Debt 201 Sustainable Development in Ecuador Geofile 471 2004 Action Aid in Africa Geofile 453 2003 Sustainable Development in South Africa Geofile 528

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
				Development Indicators New Internationalist: www.newint.org For proportional maps: www.worldmapper For animated graphs comparing development indicators: www.gapminder. org Make poverty history: www.makepovertyhistory.org
3.3 The development of international tourism	To understand the nature of tourism	**Tourism** **Invisible export** **Tertiary/service industry**	It is useful to reach a consensus as to what tourism is – this could be done by a brainstorming session, from which it should emerge that there are many kinds of activity which could be classed as tourism. Distinguish between leisure and recreation. Make the link to trade.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 418–426 Section 3.3 Activities Page 420, 422 425 and 427 **Past papers** Section 3.3 Questions: June 2011 Question 6(b)

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
				November 2011 Question 6(a) June 2010 Question 6 November 2010 Question 6(a)
	The growth of tourism –social, economic and political factors that have influenced its nature and growth	**Demand factors** e.g. income, time available **Supply factors** e.g. charter flights, package holidays **Facilitating factors** e.g. electronic communication, advertising, the media, globalisation	Reference to a thematic atlas map of tourist origins and destinations could form the basis for a discussion of global patterns of tourism.	Geo Factsheet 1 Sept 1996 International Tourism (This is a little dated but a good talking point.)
	To study the changes in the patterns of origin and destination of international tourists	**Pleasure periphery** **Models of tourism** **Life cycle model** (Butler)	Use statistics for tourism destinations for different years to analyse the rate of growth in international tourism and to find out the patterns.	
			A suggestion: discuss the learners' own experiences of holiday destinations (if applicable) and their perceptions as gathered from the media. The intention is to lead into the idea of the life cycle model. The life cycle model could be presented and appropriate case study examples could be used to demonstrate its application (and predictions?).	
	To examine the economic, social and	**Leakage** **Multiplier effect**	Case study – environmental impact of tourism. Local examples are encouraged as they are readily relevant and familiar. It is	Geo Factsheet 81 January 2000 Tourism

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	environmental impacts of tourism on the receiving countries/ tourist destinations The impacts must include impacts on: Economies Societies Environments	**Carrying capacity** **Honeypot sites** **Sustainable tourism**	essential that both positive and negative environmental impacts on tourist destinations are included. Perception of impacts should be discussed. Appreciation that tourism may be an unstable industry, subject to rapid change. Learners may be able to contribute experience of this from their own lives or home areas. Use could be made of news reports about the impacts of terrorist acts on tourism (e.g. Bali) or hazards (e.g. the Asian tsunami). Local familiar case studies are recommended, but it is essential that they contain facts, statistics, locations and, preferably, a map. Case study – Growth of tourism in Australia Case study – News report: effects of terrorism on tourist trade in Egypt.	in Southern France
	To examine the nature of recent developments in tourism	**Carrying capacity** **Ecotourism** **Green tourism** **Heritage tourism** **Cultural tourism** **Wilderness tourism** **Adventure tourism** **Sustainable tourism** **Ethical tourism**	The tourism industry is dynamic, constantly redefining what tourism is and diversifying the tourism product. Case study 1 – Nature tourism in Costa Rica Case study 2 – Tourism in Thailand Case study 3 – Tourism in Kenya	Geo Factsheet 112 April 2001 Can Ecotourism work?
3.4 The management	To examine and evaluate the complex		The case study may best be located somewhere which is familiar to, or readily understood by, learners.	*Cambridge International A and AS*

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
of a tourist destination	nature of the impacts of tourism on one specific tourist area or resort, to illustrate Growth Development Issues of sustainability Impacts		Emphasis should be given to management issues at all stages. Suggested case studies, as a guide: Case study 1 – Tourism in South Africa Case study 2 – Malham, Yorkshire Dales National Park, UK The need to protect areas Case study 3 – Canada Case study 4 – Antarctica Case study 5 – Tourism in Brazil, Iguaçu	*Level Geography* (Nagle and Guinness) Pages 427–430 provides a case study of Jamaica. Geo Factsheet 103, January 2001 Managing US National Parks **Past paper** November 2010 Question 6(b)

Paper 3 Human options – Unit 4: Economic transition

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
4.1 National development	Classification of economic activity – knowledge that economic activity can be classified into primary, secondary, tertiary and quaternary sectors • Nature of these sectors • Activities in these sectors • Role of each sector in development	**Primary industry** **Extractive industries** **Manufacturing and processing industries** **Service sector** **High-technology industry** **Information technology** **R&D** **Management consultancy**	This section could be introduced by showing a series of slides or photographs of people at work in different occupations, leading to a general discussion of the basis for classification. If too simplistic at this level, statistical analysis could be done. There is little agreement in the textbooks about the classification: this makes an excellent point for discussion after learners have completed research as an out of class activity. Discussion could be linked to the Clark Fisher sector model of development. A follow-up exercise could utilise triangular graphs, or a series of pie charts, to compare the distribution pattern of employment structures in different countries and/or change over time.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 431–442 Figure 4.1 Page 431 shows Food Industry's Product Chain (illustrates primary, secondary, tertiary and quaternary) Figure 4.2 Page 432 gives a Triangular Graph of Employment Structures Figure 4.3 Page 433 shows the Sector Model Figure 4.6 and Table 4.3 page 435 shows Worldwide GNI PPP per capita Figure 4.7 Page 436 shows Human Development Index

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
				Figure 4.15 Page 440 shows Stages of Development Section 4.1 Activities Pages 433, 440 and 442 Geo Factsheet 147 April 2003 The Development Gap
	To understand and appreciate global patterns of development and social and economic wellbeing • Distribution • Nature Factors influencing global disparities in development • Causes e.g. environmental, political; positive and negative; short-term and longer term	**MEDCs** **LEDCs** **Development gap** **Development continuum** **Brandt line** **North-South divide** **NICs** **RICs** **BRIC** **GDP/GNP** **Indices of development** **HDI** **Inequalities** **Core and periphery-global/regional**	Definitions and global patterns using world maps of different indices e.g. GNP. Look at distribution, global North and global South and anomalies. Describe the pattern – spatial patterns are particular to geography and an understanding of them is important. Patterns may be repetitions of the same phenomenon and may show clusters, highs and lows, etc. Anomalies are exceptions to the pattern. Then ask learners to **explain** the pattern/ Brandt line and the anomalies. This is a higher order skill and needs understanding of the factors that influence development. See development as a continuum. Use a brainstorming session and a matching exercise to analyse the effectiveness of different economic and social indicators in demonstrating variations in quality of life.	See Sheffield University (UK) website for their recently developed topological maps, an excellent teaching resource. UN websites have useful information. **Past papers** June 2011 Question 8(a) November 2011 Question 7 June 2010 Question 7(a) November 2010 Question 8(a)

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	To understand that the pattern of economic activity in a country is a reflection of its current level of economic development. Scale is important Global/ National	**and national scale** **Resource-rich zones** **Resource-poor zones**		
	To understand the use of social and economic indices as measures to compare quality of life in different countries	**PQLI – Physical Quality of Life Index** **HDI – Human Development Index** **Standard of living** **Quality of life** **Demographic indices e.g. IMR** **Literacy** **GDP/GNP**	Case study 1 – Sub-Saharan Africa Case study 2 – Development in a Javanese village Case study 3 – Development in a named NIC	Geo Factsheet 140, January 2003 Least Developed Countries United Nations Conference on Trade and Development: www.unctad.org OneWorld (online civil society portal): www.oneworld.org United Nations: http://un.org
4.2 The globalisation of industrial activity	To examine the concept of globalisation	**Globalisation** **Industrialisation** **Teleconnections** **Internet** **email**	Globalisation is the process in which national economies are becoming more and more integrated into a single global economy. It includes the spread of ideas and cultures too. Actions and decisions taken in one part of the world have knock-on effects in other parts.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 442–453

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
		Factors promoting globalisation **Time-space concept**		Figure 4.22 Page 444 shows Globalisation Trends Table 4.7 Page 446 shows the World's Largest Corporations Figure 4.31 and 4.32 shows the Development of a TNC Section 4.2 Activities Pages 446, 450 and 453 **Past papers** June 2011 Question 7 June 2010 Question 7(b) November 2010 Question 7
	To study the global patterns of resources and primary production – link to the development gap • Production • Markets	**Primary production** **Extractive industries** **Markets e.g. newly emerging** **Trading patterns**	LEDCs tend to be dependent on primary sector (agriculture and extractive industries). The nature of the industries also varies spatially. Links back to Units 4.1 and 3.1.	An atlas is a useful source.
	To compare patterns	**Division of labour**	NIDL is the shift of low-end manufacturing and assembly jobs	

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
	in the new international division of labour (NIDL)	**NIDL** **Employment structures** **Global shift** **FDI**	from traditional MEDC centres to new locations where labour costs are lower and other locational advantages may exist. It also involves the relocation of other types of work, such as research to some NICs.	
	To understand that globalisation means that industrial growth in one country may impact on the industrial activity in another country i.e pattern of NIDL and global shift Factors that have influenced these new patterns of industrial activity • Economic • Political Social and environmental factors may play a lesser role	**Industrial relocation** **Industrialisation** **Deindustrialisation** **Competition** **Rationalisation** **Reindustrialisation** **Comparative advantage** **Outsourcing** **Offshoring** **Call centres** **Tele-working** **Tax havens**	Case study – Deindustrialisation in the UK and EU **Note:** Consider factors in MEDCs and LEDCs	Geo Factsheet 107
	To examine the nature of transnational corporations (TNCs)	**Transnational corporation** **Host country** **Base country** **Outsourcing** **Offshoring**	A model of the way in which TNCs grow and develop over time. Could look at the motor vehicle industry and different companies globally as an introduction. Link the TNC to the whole notion of globalisation. Emphasise diversity and change e.g. TNCs may have HQs in NICs and manufacture in MEDCs. **Note:** Try keeping the theory to a minimum and doing the work	Geo Factsheet 86 Globalisation of Manufacturing McDonald's: www.mcdonalds.com/countries.html

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
			through the case study to reduce teaching time.	
	To gain knowledge of the global operations of one TNC • Growth • Spatial structure • Operations There is freedom to choose which TNC is studied.	**Products** **Markets** **HQ** **Regional HQ** **R&D** **Plants e.g.** **Full production assembly**	Case study – The Virgin company/ Nike/Mattel • Operations • Organisation • Production • Factors that have influenced growth and development: labour, health and safety regulations, pollution, government legislation and incentives, i.e. economic, social, environmental and political factors • Include the positive/negative factor of deindustrialisation in MEDCs	Geo Factsheet 123 January 2002 Virgin – a new breed of MNC?
4.3 Regional development **Note** This is to be studied at the national scale, i.e. within a country	Appreciation of economic and social disparities and inequalities within countries	**Regional disparity** **Regional development** **Resource region** **Core-periphery**	Show that economic development is rarely evenly distributed within a country. Policies are needed to seek to spread economic growth. Best pursued using a case study. Home country case studies are accessible to learners and welcomed when the knowledge is detailed and supported with local detail e.g. facts, locations and data. Other classic studies exist, e.g. Brazil.	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 454–463 Section 4.3 Activities Page 457 Figure 4.41 Cumulative Causation Page 456 Geo Factsheet 113, April 2001 Regional Inequalities

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
				Past papers November 2011 Question 8(a) June 2010 Question 8
	Development of a region within a country may be encouraged by the process of cumulative causation	**Core-periphery model (Friedmann)** **Initial advantage** **Spread effects** **Cumulative causation** **Multiplier effects** **Backwash effects** **Growth poles**	Case studies – Development in India or in South Korea	
4.4 The management of development	To study and evaluate the strategies adopted by *one* country for social and economic development This may be for national development of the country or for addressing regional inequalities within the country Local, familiar, case studies are recommended.	.	Teaching should focus on management issues and centre on the discursive elements here. • Nature of policy • Management issues • Relative success or failure of the strategies e.g. economic, social, political and environmental; spatially; and different groups of people. Case study 1 – The industrial and economic development of Singapore Case study 2 – Regional policy in the UK Case study 3 – Regional development in Canada Case study 4 – Hong Kong Case study 5 – Industrial growth in Malaysia Case Study 6 – India	*Cambridge International A and AS Level Geography* (Nagle and Guinness) Pages 463–466 includes case study of Bolivia Geo Factsheet 128, April 2002, India: a Third Generation Newly Industrialised Country? **Past papers** November 2011 Question 8(b)

Syllabus ref	Learning objectives	Terminology	Suggested teaching activities	Learning resources
				June 2011 Question 8(b)
			Past and specimen	
			Past/specimen papers and mark schemes are available to download at https://teachers.cie.org.uk *[where relevant list specific papers with or without specific Qs, e.g. Jun 13 Paper 12 Qx]*	

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