Scheme of work

| Syllabus reference | Approx. time allocation | Learning objectives | Key terms | Notes | Resources |
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| **CORE PHYSICAL GEOGRAPHY** | | | | | |
| Topic 1 Hydrology, river processes and hazards | 30 hours |  |  |  |  |
| 1.1 The drainage basin system | 10 hours | **1.1.1 The drainage basin as an open system and 1.1.2 movement of water through the drainage system**   * Inputs: precipitation (rain, snow, hail). * Outputs: evaporation, transpiration, condensation and channel flow. * Stores: atmosphere (clouds), vegetation (interception and through roots), surface (channel, lake), soil, bedrock (groundwater store below water table). * Transfers: stemflow, throughfall, infiltration, overland flow/surface runoff (Hortonian and saturation excess overland flow), throughflow, percolation, groundwater flow/baseflow, water table.   **1.1.3 Drainage basin characteristics influencing the movement of water**   * Basin: size and shape, drainage density, porosity and permeability of soils (clay, silt, sand) and rock types (granite, limestone, chalk, sandstone, clay), vegetation type and land use. * Climate: precipitation type, duration and intensity, temperature, evapotranspiration, antecedent moisture.   **1.1.4 Discharge relationships and hydrographs**   * Annual hydrographs: reading and interpreting variations in discharge through the year using hydrographs. * Factors influencing variations in discharge through the year: climate (precipitation type, duration and intensity, temperature, evapotranspiration, antecedent moisture), vegetation type, land use. * Storm hydrographs: components (rising/recessional limbs, peaks, lags) including amount and timing of rainfall. * Factors influencing storm hydrographs: climate (precipitation type, duration and intensity, temperature, evapotranspiration, antecedent moisture), vegetation type, land use, drainage basin characteristics. | Abstraction  Aeration zone  Albedo  Altitude  Annual hydrograph (river regime)  Antecedent soil moisture  Aquifers  Atmosphere  Baseflow  Biosphere  Carboniferous limestone  Channel  Channel storage  Climate  Closed system  Discharge  Drainage basin  Drainage density  Evaporation  Evapotranspiration (EVT)  Field capacity  Flood  Fog  Groundwater  Hortonian flow  Hydrological cycle  Hydrology  Infiltration  Infiltration capacity  Input  Interception loss  Lithosphere  Moisture availability  Open system  Outputs  Overland flow  Peak discharge  Peak flow  Percolation  Percolines  Permeability  Phreatic zone  Porosity  Precipitation (PPT)  Quickflow/stormflow  Rainfall  Recessional limb  Reservoir  Rising limb  Slope  Soil moisture  Soil moisture deficit  Soil moisture recharge  Soil moisture surplus  Soil moisture utilisation  Springs  Stemflow  Storm hydrograph  Sublimation  System  Throughfall  Throughflow  Time lag  Transpiration  Urbanisation  Water balance  Water table  Water vapour  Wilting point | * Emphasis should focus on the drainage basin as an open system with inputs, processes and outputs. Students should be encouraged to use flow diagrams, as well as sketch diagrams. Important for students to understand the relationship between inputs, outputs, stores and transfers and how a change in an input can cause change through the system. * Students should appreciate the time-scale involved with hydrographs (generally less than a week) and regimes (usually over a year). Students should examine natural factors that influence hydrographs as well as human factors. | Student’s Book: pages 1–12  Teacher’s Guide:   * Key terms * Topic summary * Additional example: Stores, inputs, transfers and outputs in the River Glyme, UK * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| 1.2 River channel processes and landforms | 10 hours | **1.2.1 River channel processes**   * Erosion: abrasion/corrasion, solution, cavitation and hydraulic action. * Load transport: traction, saltation, suspension and solution. * Relationship of velocity, discharge and load size.   **1.2.2 River flow**   * River flow: velocity and discharge, patterns of flow (laminar, turbulent and helicoidal) and thalweg.   **1.2.3 Formation of river landforms by erosion and deposition processes**   * Landforms of erosion and deposition: riffle and pool sequences, meanders (river cliffs, point bars, oxbow lakes), waterfalls, gorges, bluffs, floodplains, levees. | Abrasion  Attrition  Backswamp  Bankfull  Bed (tracted) load  Capacity  Cavitation  Competence  Corrasion  Corrosion (solution)  Critical erosion velocity  Entrainment  Floodplain  Geology  Gorge  Gradient  Helicoidal flow  Hjülstrom curve  Hydraulic action  Hydraulic radius  Incised meander  Ingrown meander  Intrenched meander  Laminar flow  Levee  Load  Meandering channels  Oxbow lake  Point bars  Pools  Riffles  River bluffs  River cliffs  Saltated load  Settling or fall velocity  Sinuosity  Solution  Straight channel  Suspended load  Thalweg  Turbulent flow  Velocity | * Students should study processes of erosion, transport and deposition, as well as the factors that influence them. * They should also examine landforms of erosion and deposition. * There are opportunities to use mapwork, aerial/oblique photographs, satellite images and a range of skills-related resources. | Student’s Book: pages 13–19  Teacher’s Guide:   * Key terms * Topic summary * Additional example: Niagara Falls, North America * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **1.3 River flood hazards and impacts** | 10 hours | **1.3.1 Causes of river floods**   * Physical factors that affect river discharge and cause flooding: duration and intensity of precipitation, snowmelt and ice melt, drainage basin characteristics. * Human land-use changes that affect river discharge and cause flooding: deforestation, changing agricultural systems, urbanisation.   **1.3.2 Impacts of floods**   * Impacts on people and the environment: short-term impacts and long-term impacts. * Physical factors and human factors of vulnerability to flood hazards and impacts: scale and duration of flood event, population density, infrastructure, economic development.   **1.3.3 Management of river floods**   * Prediction of flood risk: recurrence intervals, hazard mapping. * Forecasts (discharge measurements at gauging stations, rainfall, snow and ice melt), and warnings. * Effectiveness of hard engineering management strategies: dams, river straightening, artificial levees, diversion spillways. * Effectiveness of soft engineering management strategies: floodplain and drainage basin management, including afforestation and wetland and riverbank conservation. * Emergency responses to river flooding.   **1.3.4 Detailed specific example of one recent flood**   * Prediction and forecasting, causes, impacts and an evaluation of the success of strategies to manage river floods. | Dams  Disaster aid  Event modification  Flash floods  Flood abatement  Flood diversion  Hard engineering  High-income countries (HICs)  Infrastructure  Insurance  Land-use zoning  Loss-sharing  Low-income countries (LICs)  Recurrence interval  Risk  Risk assessment  River straightening  Soft engineering  Straightened channels  Vulnerability  Weather | * Students could start with an examination of human impact on river discharge due to deforestation, afforestation and urbanisation. * They should study the causes and consequences of flooding, and the potential management of floods through forecasting, use of recurrence intervals and hard and soft engineering. * Students are required to use a Detailed Specific Example of a named flood. The floods resulting from Storm Daniel in Libya in September 2023 is provided. | Student’s Book: pages 19–30  Teacher’s Guide:   * Key terms * Topic summary * Additional examples: Lessons to learn from the Ahr floods of 2021; Costs and benefits of the Kissimmee River restoration scheme, Florida, USA * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **Topic 2 Atmospheric processes and global climate change** | 30 hours |  |  |  |  |
| **2.1 Energy budgets** | 10 hours | **Introduction to the atmosphere**   * Atmospheric pressure, composition and structure of the atmosphere.   **2.1.1 Energy budget systems**   * Inputs and outputs: incoming (short-wave) solar radiation, outgoing (long-wave) terrestrial radiation, absorption, reflection (albedo), scattering, conduction, back radiation. * Transfers: latent heat and sensible heat transfer.   **2.1.2 The global energy budget**   * The latitudinal pattern of radiation: excesses and deficits. * The natural greenhouse effect.   **2.1.3 Global transfers of energy**   * Atmospheric: Tri-cellular model of atmospheric transfer (Polar, Ferrel and Hadley cells, inter-tropical convergence zone (ITCZ)), wind belts, jet streams. * Oceanic: vertical and horizontal transfers by ocean currents and ocean gyres. * Links between atmospheric and oceanic transfers.   **2.1.4 Seasonal variations in temperature, pressure and wind belts**   * Influence of latitude, land/sea distribution and ocean currents.   **2.1.5 Diurnal energy budgets**   * Differences between daytime and night-time. | Aerosols  Anticyclone  Atmospheric scattering  Atmospheric solids  Back radiation  Carbon dioxide  Chlorofluorocarbons (CFCs)  Conduction  Continental  Convection  Coriolis force  Deficit of radiation  Depression  Dew  Doldrums  El Niño Southern Oscillation (ENSO)  Energy budget  Excess of radiation  Ferrel cell  Greenhouse effect  Greenhouse gases  Hadley cell  Industrial Revolution  Insolation  Inter-tropical convergence zone (ITCZ)  Isothermal layer  Jet streams  Latent heat transfer  Long-wave infrared radiation  Maritime  Mesopause  Mesosphere  Methane  Microclimate  Natural greenhouse effect  Net long-wave radiation balance  Ocean gyres  Oceanic conveyor belt  Planetary albedo  Polar cell  Pressure  Pressure gradient  Radiation  Sensible heat transfer  Short-wave radiation  Solar constant  Stratopause  Stratosphere  Temperature inversion  Temperature lapse  Thermal stratification  Thermocline  Thermohaline circulation  Thermosphere  Thunderstorms  Tropopause  Troposphere  Ultraviolet (UV) radiation  Wind belt | * The focus is on the global energy budget and the main atmospheric transfers of energy. * Seasonal and latitudinal variations in temperature, pressure and winds are examined and the factors responsible for these changes should be understood. * Students should compare the operation of the daytime energy budget with that of the night-time energy budget. An example is provided for Washington, DC, USA. | Student’s Book: pages 31–48  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **2.2 Weather processes and phenomena** | 10 hours | **2.2.1 Atmospheric moisture processes**   * Evaporation, condensation, freezing, melting, deposition and sublimation.   **2.2.2 Causes of precipitation**   * Convection, frontal and orographic uplift of air and radiation cooling.   **2.2.3 Types of precipitation**   * Clouds, rain, hail, snow, dew and fog. | Advection fog  Clouds  Condensation nuclei  Convectional rainfall  Dew point  Drizzle  Frontal/cyclonic (depressional) rainfall  Hail  Hygroscopic  Melting  Orographic (relief) rainfall  Radiation cooling  Radiation fog  Rainshadow  Relative humidity  Saturated  Sleet  Smog  Snow  Steam fog  Supercooled water  Vapour pressure | * This section explores weather processes and phenomena, looking at evaporation, condensation, types of precipitation and types of cloud. * Students should understand the mechanisms of cloud and rain formation. | Student’s Book: pages 48–52  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **2.3 Global warming and climate change** | 10 hours | **2.3.1 Evidence for global warming and climate change**   * Proxy evidence for past climatic conditions: ice cores, tree rings, and fossils. * Evidence of recent atmospheric and sea temperature increases: recorded temperatures since 1850. * The link between temperature records (pre- and post-1850) and carbon dioxide emissions. * Other evidence of global warming: sea-level rise, sea ice reduction, ice sheet and glacial shrinkage.   **2.3.2 Causes of global warming and climate change**   * The greenhouses gases (GHGs): carbon dioxide, methane, nitrous oxide, F gases. * Global warming potential (GWP): Longevity and absorption in the atmosphere. * Abundance in the atmosphere. * Carbon dioxide equivalence (CO2 equivalence). * Annual Greenhouse Gas Index (AGGI) * Natural (physical) factors that affect global energy budgets: long-term impacts such as solar output, shorter-term impacts such as volcanic eruptions, El Niño Southern Oscillation (ENSO). * Anthropogenic (human) factors that affect global energy budgets: increased greenhouse gas emissions, greenhouse gas absorption and storage, reflection (albedo), the significance of the impact of the enhanced greenhouse effect on global energy budgets. | Anthropogenic  Carbon dioxide (CO2)  Carbon dioxide equivalent (CO2e)  Carbon sinks  Climate change  Climate sensitivity  CO2 fertilisation  Enhanced greenhouse effect  Global warming  Global warming potential  Heavy industry  Ice-albedo feedback loop  Paddy fields  Tipping points | * Students should recognise the difference between proxy evidence and recorded data and appreciate that climate change is not just a recent phenomenon. * The role of GHGs is vital, and their different efficacies should be recognised. * A link should ultimately be made between current climate change and the global energy budget. | Student’s Book: pages 52–68  Teacher’s Guide:   * Key terms * Topic summary * Additional example: Climate change in Europe * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **Topic 3 Earth processes and mass movements** | 30 hours |  |  |  |  |
| **3.1 Plate tectonics** | 10 hours | **The structure of the Earth**  **3.1.1 Tectonic plates**   * Continental plates and oceanic plates: density, age, thickness and composition. * Relative directions and rates of plate movement.   **3.1.2 Tectonic movement**   * Continental drift theory and the ‘jigsaw’ fit of continents. * Geological and fossil records. * Evidence for sea-floor spreading: Earth’s magnetic field recorded in rocks (palaeomagnetism), the age of sea floor rocks. * Convection currents, slab pull, ridge push.   **3.1.3 Global distribution of types of plate boundaries:**   * Convergent/destructive. * Convergent/collision. * Conservative/transform. * Divergent/constructive. | Asthenosphere  Basaltic  Conservative boundaries  Continental crust  Continental drift  Convergent (collision) plate boundaries  Convergent (destructive) plate boundaries  Core  Crust  Divergent (constructive) plate boundaries  Folding  Granitic  Hotspot  Lava  Magma  Mantle  Mid-ocean ridges  Oceanic crust  Palaeomagnetism  Plates  Plate tectonics  Ridge push  Slab pull  Subducted  Transform fault | * This is an introduction to basic plate tectonics – types of plates, plate boundaries and their global distributions. * Students should understand the evidence for the underpinning theory of continental drift and be able to explain the mechanisms of plate movement. | Student’s Book: pages 69–73  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **3.2 Tectonic processes and landforms** | 10 hours | **3.2.1 Tectonic processes**   * Subduction at convergent/destructive boundaries. * Shearing and thrusting at convergent/collision boundaries. * Faulting at conservative/transform boundaries. * Faulting and rifting at divergent/constructive boundaries. * Sea-floor spreading at divergent/constructive boundaries.   **3.2.2 Formation of landforms by tectonic processes**   * Fold mountains, volcanoes, mid-ocean ridges, ocean trenches, volcanic island arcs, fault scarps, rift valleys. | Accretionary wedge / accretionary prism (subduction complex)  Arcuate chains  Andesetic  Benioff zone  Compression  Cone-shaped volcanoes  Confining stress  Elastic deformation  Fault scarp  Faults  Fracture  Inner slope  Island arcs  Land areas  Ocean trenches  Orogenic mountain belts  Outer slope  Plastic deformation  Rift valley  Sea-floor spreading  Shear stress  Shearing  Subduction zone  Tension  Thrusting  Trench outer rise | * Students should understand the processes that occur at different types of plate boundary, and how those processes led to the formation and development of distinctive landforms. * Cross-sectional diagrams through the plate boundaries are particularly useful, as are named examples as evidence. | Student’s Book: pages 74–79  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **3.3 Mass movement hazards and impacts** | 10 hours | **3.3.1 Types of mass movement**   * Heaves, flows (mudflows, debris flows), slides (landslide, rotational slides/slump), falls (rock)   **3.3.2 Physical and human causes of mass movement**   * Natural causes: geology, topography, precipitation intensity and amounts, potential impact of climate change. * Human causes: building and road construction; land use change, water management.   **3.3.3 Management of mass movement hazards**   * Prediction and risk identification of mass movements (hazard mapping and monitoring). * Impacts of mass movements on people and the environment. * Management strategies: pinning, netting, slope grading, slope drainage, afforestation, planning restrictions on building and development. * Emergency responses and recovery.   **Detailed specific example of one recent mass movement event**   * Prediction, impacts on people and the environment and an evaluation of the success of strategies to manage mass movement hazards. | Afforestation  Coastal protection  Cohesive forces  Disaster  Early warning system  Falls  Fibre-reinforced soil system  Flows  Friction  Geogrids  Greening techniques  Hazard  Heaves/creep  Informal housing  Landslides  Long-rooting grass  Mass movements  Mulching  Netting  Pivoting  Pore water pressure  Regolith  Rehabilitation  Rotational slides (slumps)  Safety factor  Shear strength  Shear stress  Slides  Slip plane  Slope angle  Slope processes  Talus creep  Terraces  Terracettes  Vegetation  Washouts | * This is an introduction to slopes and mass movement. The emphasis is on mass movement rather than slopes, but simple slope terminology is introduced. * A number of examples of mass movements illustrate their relative speed, type of movement and potential impacts. * An appreciation of the underlying principles of slope stability and instability is important for students. * The DSE of landslides in Hong Kong can be used to illustrate and evidence the issues around the management of mass movement hazards. | Student’s Book: pages 79–92  Teacher’s Guide:   * Key terms * Topic summary * Additional examples: Landslides in Puerto Rico; Sidoarjo mudflow; The global landslide hazard – natural causes and human causes * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **CORE HUMAN GEOGRAPHY** | | | | | |
| **Topic 4 Population and migration** | 30 hours |  |  |  |  |
| **4.1 Global population** | 10 hours | **4.1.1 Population distribution and density**   * Current patterns of global population distribution. * Factors influencing population density: physical, environmental, social, economic, political, historical.   **4.1.2 Trends in global population growth and regional variations**   * Factors affecting global and regional population growth: physical, environmental, social, economic, political, historical. * Recent demographic change.   **4.1.3** **Components of population change and their spatial variations**   * Natural increase and net migration: crude birth rate and crude death rate, fertility rate and total fertility rate (TFR), fertility decline, factors affecting levels of fertility, mortality and life expectancy, infant mortality rate (IMR), causes of death, Covid-19 pandemic. | Carrying capacity  Child mortality rate  Crude birth rate  Crude death rate  Cumulative causation  Demographer  Densely populated  Fertility rate  Infant mortality rate  Life expectancy at birth  Natural change  Natural decrease  Natural increase  Net migration  Population density  Population distribution  Population momentum  Population projections  Replacement level fertility  Rural population  Sparsely populated  Total fertility rate (TFR) | * This section promotes knowledge and understanding of basic demographic terminology and the skills required to interpret demographic data and graphical and cartographical illustrations. It provides the platform for the remaining sections of the topic. | Student’s Book: pages 93–106  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **4.2 Population structure** | 10 hours | **4.2.1 Population structures**   * Components of population structure: age, sex. * Dependency: dependency ratio, youth dependency ratio, aged dependency ratio. * Demographic dividend. * Sex structure: sex ratio, differences within countries. * Interpretation of different age/sex structure diagrams.   **4.2.2 Changes in population structures over time**   * Factors influencing population structure: natural increase and net migration. * Stages in the Demographic Transition Model (DTM), its purpose, limitations and usefulness when applied to a range of countries. * Impacts of youthful population structures and ageing population structures: social, economic, environmental, political impacts.   **4.2.3 Government attempts to manage natural increase**   * Reasons why governments attempt to manage the consequences of natural increase.   **Detailed specific examples of population policies in two contrasting countries – India and France.**   * How successful have pro-natalist policies been?   **Detailed specific example: Managing natural increase in China.** | Aged dependency ratio  Ageing of population  Anti-natalist policies  Demographic ageing  Demographic dividend  Demographic preparedness  Demographic transition model  Dependency ratio  Family planning programme  Gender dividend  Population policy  Population pyramids  Population structure  Pro-natalist policies  Selective abortion  Sex ratio  Social norms  Youth dependency ratio | * The merits and limitations of the Demographic Transition Model form the basis of this section, leading on to the issues associated with high youth and elderly dependency. As countries develop, their demographic characteristics change – here the focus is on infant mortality and life expectancy. * Examples of government policies in India and France are provided. | Student’s Book: pages 107–19  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| * 1. **Migration** | 10 hours | **4.3.1 International migration types**   * Voluntary: economic, social. * Non-voluntary (forced): asylum seekers, refugees. * Temporary and permanent.   **4.3.2 Causes of migration**   * Push and pull factors: economic, cultural, demographic, political, environmental. * Migration theory: E S Lee’s model. * Constraints (obstacles and barriers) to migration: physical, environmental, social, economic, political. * Forced migration: internally displaced persons, ethnic cleansing, refugees and asylum seekers, human trafficking.   **4.3.3 Impacts of migration**   * Positive and negative impacts (economic, cultural and social, political, demographic and environmental) on source areas, receiving/destination areas and migrants. * Factors influencing the level of impact of migration: number of migrants, migrant characteristics, type of migrant flow, wealth, level of education and skill, existing population characteristics of source areas, receiving/destination areas. * The management of migration.   **Detailed specific example of the impacts of international migration on one country**   * The causes, characteristics, scale, pattern, impacts and an evaluation of attempts at managing migration. | Assimilation  Asylum seeker  Capital  Chain migration  Counterstream  Depopulation  Destination  Diaspora  Economic optimum  Emigration  Ethnic cleansing  Forced migration  Guest workers  Human trafficking  Immigration  In-migration  Internal migration  Internally displaced person  International migration  Intervening obstacles  Labour-related migration  Mass migration  Migration  Migration corridors  Migration stream  Modern slavery  Multiplier effect  Origin  Out-migration  Overpopulated  Pull factors  Push factors  Refugee  Relay migration  Remittances  Shifting cultivation  Stepped migration  Underpopulated  Urban hierarchy  Voluntary migration | * The main theme initially is the distinction between voluntary and forced movements. The large scale and increasingly controversial nature of international migration is also emphasised along with the economic importance of remittances. * Push and pull factors should be understood, as should the impact of obstacle/barriers to migration. * The positive and negative impacts of migration should be appreciated, for both the source and receiving areas. Factors influencing these impacts should be understood. The above should then be applied to a DSE, with immigration to the USA, particularly from Mexico, provided as an example. | Student’s Book: pages 119–37  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **Topic 5 Water resources and management** | 30 hours |  |  |  |  |
| **5.1 Global water resources** | 10 hours | **Global water crisis**  **Types of water resource**  **5.1.1 Patterns of water resources, spatial variation and changes over time**   * Types of water resources: rivers, lakes and reservoirs, oceans and seas, ice sheets, glaciers, groundwater, precipitation, recycled, in the atmosphere as water vapour and clouds. * Global pattern of water resources.   **5.1.2 The human water cycle**   * Capture, management, use, disposal, reuse of water. * Modification to the water cycle: agriculture, deforestation and afforestation, urbanisation, industrialisation, water abstraction, flood management.   **5.1.3 Trends in water consumption**   * Water surplus and water depletion. * Water stress and water scarcity (physical and economic). * Water consumption linked to economic development. * Changing demands for water from human activities: agriculture, domestic use and different industrial sectors. * Groundwater use. * Water consumption and affluence. | Agricultural productivity  Arid and semi-arid  Deforestation  Economic water scarcity  Fluxes  Fossil water  Heat island  Human water cycle  Irrigation  Land use  Middle-income countries  Net forest loss  Physical water scarcity  Potable water  Reforestation  Saltwater intrusion  Sea level  Terrestrial moisture balance  Water abstraction  Water depletion  Water quality  Water recycling  Water scarcity  Water stress  Water supply  Water surplus  Water utilities  Wetland | * Students are introduced to a range of water sources, their global pattern and their spatial and temporal variation. * Building on the study of the water cycle in Topic 1, students should understand the increasing influence of human activity on the water cycle. * Students should develop a secure grasp of the concepts of water stress and water scarcity and their links to economic development. | Student’s Book: pages 138–50  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |

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| **5.2 Factors influencing water resources at regional/national scale** | 10 hours | **5.2.1 Factors that influence the supply of water (volume and quality)**   * Physical factors affecting water resource: climate, soils and geology, drainage patterns, relief. * Human factors affecting water resource: storage and water transfers, water abstraction, desalination, cloud seeding, water treatment and recycling, type of infrastructure.   **5.2.2 Factors influencing the demand for water**   * Population characteristics: number and wealth. * Economic structure: type of industry, agriculture, recreation and tourism. * Seasonal demand. * Water access issues: poverty, pollution, infrastructure.   **5.2.3 Water security**   * The concept of water security. * Global patterns of water security. * Physical and human factors that contribute to water insecurity. * Floods and water resources. * Impact of water insecurity. | Alluvial aquifers  Artesian well  Cloud seeding  Desalination  Equatorial cold tongue  Flood impact assessment  Grey water  Humidity  Hydrological drought  Impermeable  Malnutrition  National security  Pollutants  Rainwater harvesting  Reservoirs  Soil texture  Water footprint  Water insecurity  Water investment gap  Water pollution  Water security  Water treatment  Water-energy-food-ecosystem (WEFE) nexus  Wellfields | * Students should study the physical and human factors influencing water supply and factors influencing demand. * The concepts of water security and insecurity and their related issues should be recognised as an increasingly significant global concern. | Student’s Book: pages 150–65  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **5.3 Management of water resources at regional/national scale** | 10 hours | **5.3.1 Strategies to increase water resources and access to water**   * Relative success of strategies: dams and reservoirs, multi-purpose river schemes, water transfer schemes, desalination, rainwater harvesting, use of grey water, technological solutions for areas without piped and clean water supplies.   **5.3.2 Strategies to manage demand for water**   * Increasing the price, restricting use and rationing, use of technology (‘big data’ analytics) to reduce amount needed, education about water conservation.   **5.3.3 Management of water resources**   * The need to manage water resources. * Impact of variability in water resources (volume and quality): environmental, economic, social, political. * Integrated water cycle management. * Challenges of managing water resources: rates of abstraction, saltwater incursions, water conflicts, transboundary issues, water pollution and ground subsidence.   **Detailed specific example of the challenges in water resources faced by one country.**   * Strategies used and evaluation of the relative success of these strategies. | Dam failure  Integrated water cycle management  Megadrought  Megaflood  Multi-purpose river schemes  Sustainability  Sustainable water management  Virtual water  Water meters  Water resources management  Water transfer schemes | * Students should study a variety of strategies that can be used to increase water supply. They should be able to evaluate their relative success. * Students should understand the options that exist for managing water demand. * A DSE of California is provided to investigate the management of water resources, including the range of challenges involved. An evaluation of the success of the strategies employed should be undertaken. | Student’s Book: pages 166–80  Teacher’s Guide:   * Key terms * Topic summary * Additional example: Transboundary issues in the GERD project * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **Topic 6 Urban areas and management** | 30 hours |  |  |  |  |
| **6.1 Urban growth** | 10 hours | **6.1.1 Processes of urban growth**   * Growth in population and area: globally and at city level: global growth, theories of urban growth. * Cities experiencing different types of urban growth: urbanisation, suburbanisation, urban sprawl, counter-urbanisation, re-urbanisation, urban renewal and regeneration.   **6.1.2 Causes and consequences of urban growth for urban and rural areas**   * Causes of urban growth: economic, social, political, historical. * Consequences of urban growth on urban areas and rural areas: environmental, economic, social, political.   **6.1.3 Urban growth and a hierarchy of urban areas**   * The concept of a hierarchy of urban areas in a country. * Primate cities: causes and consequences for countries. * World cities: hierarchies and causes. | Backwash urbanisation  Counter-urbanisation  Cycle of urbanisation  Decentralisation  Deconcentration  Foreign direct investment (FDI)  Green belts  Re-urbanisation  Rural–urban migration  Suburbanisation  Transnational corporations (TNCs)  Urban growth  Urban redevelopment  Urban regeneration  Urban renewal  Urban sprawl  Urbanisation  World city (global city) | * Students should be aware of the distinction between the ‘first’ and ‘second’ urban revolutions; the cycle of urbanisation is a fundamental concept in urban trends and issues. * The causes and consequences of urban growth should be understood, including the consequences for surrounding rural areas, as well as for the urban area itself. * Differences between world cities and primate cities should be established. | Student’s Book: pages 181–94  Teacher’s Guide:   * Key terms * Topic summary * Additional examples: The growth of Shanghai; The development of fast-growing outer suburbs, near Sydney, Australia; Counter-urbanisation and re-urbanisation in Melbourne, Australia; Urban decline in Detroit, USA * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **6.2 Urban structure and change** | 10 hours | **6.2.1 Factors which influence the structure and characteristics of urban areas**   * Factors affecting the location of urban activities. * Horizontal and vertical urban structures and urban land-use zones. * The roles of factors (physical, economic, social, political, historical) in creating distinct structures and patterns of land use. * The concept of place identity and perceptions of place.   **6.2.2 The changing location of urban activities**   * Factors (population change, cost of land, transport provision, competition for space, investment, local and national planning) causing changes in the characteristics and location of retail, manufacturing, services, residential activities. * Rate of change may vary in different cities depending on the location, economic classification and influences on change.   **6.2.3 Zonation of residential areas**   * Characteristics of different residential areas. * Causes of zonation: income, supply of housing, ethnicity, planning, culture and historical factors. | Accessibility  Central business district (CBD)  Concentric zone  Constrained location theory  Deindustrialisation  Ethnicity  Industrial estates  Post-industrial city  Rural–urban fringe  Urban morphology  Urban periphery  Urban renaissance  Zonation  Zone of assimilation  Zone of discard | * Urban models are a useful aspect of the content of this section, although the study of specific models is not explicitly required. * Students should be able to explain the influence of a variety of different factors on development and change in the structure of urban areas. The role of national and local planning policies is a key element of this and should be recognised. * Perceptions of place and place identity may be new concepts to students and need to be introduced. | Student’s Book: pages 194–206  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **6.3 Sustainable urban development** | 10 hours | **6.3.1 Challenges of sustainability in urban development**   * Different definitions of sustainability. * Difficulties in measuring sustainability. * The balance between social, economic and environmental priorities and the view of different groups of people (residents, landowners, local business owners, community groups, local and national government).   **6.3.2 Sustainable issues in urban areas**   * Solid waste disposal, transport (public and private), and quality and density of housing, the role of green space and water features.   **6.3.3 Strategies for the sustainable management of urban areas**   * Strategies for reducing the issues of solid waste disposal, pollution, transport and housing. * Constraints and incentives to successful management of urban areas.   **Detailed specific example from one urban area.**   * The challenges in sustainable management, the strategy or scheme used, and an evaluation of these strategies. | Green walls  Pollution  Sustainability  Note: some of the key terms in this section have been highlighted in earlier sections of Topic 6 but are also relevant to subtopic 6.3. | * The concept of sustainability should be explored, with different definitions considered. Students should appreciate that this is a contested concept. * The challenges for sustainable management should be recognised and a range of potential solutions considered. * Cairo is provided as a DSE and the concepts should be applied to this specific case. | Student’s Book: pages 206–14  Teacher’s Guide:   * Key terms * Topic summary * Additional example: The Beddington Zero Energy Development, London, UK * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **ADVANCED PHYSICAL GEOGRAPHY** | | | | | |
| **Topic 7 Tropical environments** | 30 hours |  |  |  |  |
| **7.1 Tropical climates** | 7.5 hours | **World climates: a classification**  **7.1.2 Climatic characteristics of rainforest and savanna environments**   * Climatic characteristics of humid tropical (rainforest) and seasonally humid tropical (savanna) environments including monsoons. * Key features of temperature and precipitation. * Annual variations and diurnal variations in temperature and precipitation.   **7.1.3 Reasons for the global distribution and climatic characteristics of rainforest and savanna environments**   * The roles of air masses, the inter-tropical convergence zone (ITCZ), subtropical anticyclones and seasonal monsoons. * The influence of El Niño Southern Oscillation (ENSO). | Air mass  Anticyclonic gloom  Coral bleaching  Diurnal  Drought  El Niño Southern Oscillation (ENSO)  Monsoon  Ocean currents | * Students study the distribution of tropical areas, and the variety of climates found in the tropics. * Students study the main factors that help to explain the characteristics of tropical climates such as pressure systems, ITCZ, ENSO (El Niño and La Niña events), air masses, ocean currents and winds, including the seasonal monsoon. They will have previously studied ENSO in Topic 2 and this should be built upon. | Student’s Book: pages 215–24  Teacher’s Guide:   * Key terms * Topic summary * Additional examples: Pakistan floods, 2022; The climate of Brunei Darussalam * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **7.2 Processes and landforms in tropical environments** | 7.5 hours | **7.2.1 Weathering processes and their significance in forming and shaping landforms**   * Chemical weathering processes: hydrolysis and carbonation. * Physical (mechanical) weathering processes: pressure release (dilatation), freeze–thaw, salt crystal growth. * Biological weathering: chelation, root growth.   **7.2.2 Granite landforms: bornhardts, kopjes and tors**   * Characteristics and formation of bornhardts, castle kopjes (koppies) and tors (boulder inselbergs): the role of weathering (etchplanation), climate, rock structure.   **7.2.3 Limestone landforms: tropical karst**   * Cone karst, tower karst and cockpit karst: distribution, characteristics and formation including the role of weathering, climate and rock structure. | Biological weathering  Bornhardt  Boulder inselberg  Calcium bicarbonate  Carbonation  Castle kopjes (koppies)  Chelation  Climatic geomorphology  Cockpit karst  Cone karst  Dwala (whaleback)  Etchplanation  Freeze–thaw  Humid tropics  Hydrolysis  Kaolin  Pressure release (dilatation)  Ruware  Salt crystal growth  Spheroidal weathering  Tors  Tower karst  Unloading (of pressure) | * This section investigates the main types of weathering found in tropical areas. * Students may need detailed coverage of this, as it is no longer studied at AS. * Landforms associated with granite are discussed, followed by landforms associated with limestone. Appreciation of theories of formation could be helpful. Formation and shaping should both be considered, and the differences between them recognised. | Student’s Book: pages 224–29  Teacher’s Guide:   * Key terms * Topic summary * Additional example: Blue holes in the Bahamas * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **7.3 Vegetation, soils and ecosystems in tropical environments** | 7.5 hours | **7.3.1 Vegetation characteristics** **of rainforest and savanna ecosystems**   * Ecosystems, communities and biodiversity. * Development of plant communities: climatic climax, subclimax and plagioclimax. * Succession in plant communities. * Vegetation in tropical rainforests: the impact of climate and human activities. * Vegetation in savannas: impact of climate and human activities.   **7.3.2 Soils in rainforests and savannas**   * Soil types and profile characteristics: oxisols/latosols, tropical red and brown earths. * Impact of human activities on tropical soils: burning clearance and deforestation. * Changes to savanna soils.   **7.3.3 Nutrient cycling in rainforests and savannas**   * Gersmehl diagrams. * Rainforest and savanna nutrient cycles: the impact of climate, vegetation and human activities, burning clearance and deforestation. * Savanna nutrient cycles. * Energy flows and trophic levels. | Biodiversity  Biogeography  Biomass  Biomes  Capillary action  Cation-exchange capacity  Climatic climax  Climax community  Closed canopy  Community  Ecology  Ecosystem  Edaphic  Emergent  Epiphytes  Ferralitic soil  Ferruginous soil  Gersmehl’s nutrient cycles  Hurricane  Laterite  Latosols  Leaching  Macronutrients  Micronutrients  Mycorrhizal  Net primary productivity (NPP)  Oxisols  Plagioclimax  Population  Pyrophytic  Sere  Shield (areas)  Soil catena  Soil profile  Sub-climax  Succession  Trophic layer  Tropical brown earths  Tropical podzol  Tropical red earths  Understorey  Vertisols  Xerophytic | * This section is quite complex, especially in relation to tropical soils. The first part introduces the idea of ecosystems, vegetation characteristics and succession. * Tropical rainforest ecosystems are considered first, and then savanna ecosystems. Both have a variety of sub-systems. * Lastly, soils and nutrient cycles of rainforests and savannas are considered. This may take time to cover, particularly for students without a solid background in Biology. | Student’s Book: pages 229–41  Teacher’s Guide:   * Key terms * Topic summary * Additional example: Succession on Montserrat, Caribbean * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **7.4 Changes and challenges in tropical environments** | 7.5 hours | **7.4.1 Changes and challenges and their impacts on tropical environments**   * Increase in population pressure and changes in land use. * Threats from exploitation: large-scale monoculture, logging, mining. * Challenges associated with climate change: regional climate change, drought and increase in wildfires, CO2 fertilisation and death of trees.   **7.4.2 Detailed specific example of a tropical ecosystem (either a rainforest or a savanna)**   * Issues affecting the ecosystem, management strategies and an evaluation of the success of those management strategies. | Mudslide  Watershed | * The human and physical challenges for tropical environments should be investigated, and students should be able to evaluate the resultant impacts. * This section includes a DSE on the savanna ecosystem of Niger. | Student’s Book: pages 241–46  Teacher’s Guide:   * Key terms * Topic summary * Additional example: The tropical rainforest ecosystem of Talamanca, Costa Rica * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **Topic 8 Coastal environments** | 30 hours |  |  |  |  |
| **8.1 Coastal processes** | 7.5 hours | **8.1.1 Factors influencing coastal environments**   * Rock type, sea-level changes. * Wave generation and wave characteristics: fetch, high and low energy waves, breaking waves, swash and backwash, wave refraction. * Coasts and climate. * Coasts and human activities.   **8.1.2 Marine erosion processes**   * Hydraulic action, cavitation, corrosion, abrasion, attrition.   **8.1.3 Sub-aerial processes**   * Physical (mechanical) weathering: freeze–thaw, salt crystal growth. * Chemical weathering: carbonation, solution, hydrolysis. * Mass movement: rock falls, landslides, mudflows, slumps.   **8.1.4 Marine transportation and marine deposition processes**   * Traction, saltation, suspension, longshore drift. * Sediment sources and characteristics, sediment cells, littoral cell system. | Backwash  Bays  Breaker  Breaking waves  Cavitation  Constructive waves  Deposition  Destructive waves  Dynamic equilibrium  Erosion  Fetch  Geological structure  Headlands  Human impacts  Lithology  Littoral cell system  Longshore drift  Neap (tides)  Offshore  Plunging breakers  Prevailing wind  Processes  Saltation  Sea-level changes  Slaking  Solution weathering  Spilling breakers  Storm waves  Sub-aerial processes  Surging breakers  Swash  Swell wave  Traction  Wash loads  Wave base  Wave energy  Wave orbit  Wave pounding  Wave refraction  Wave shoaling  Waves  Waves of oscillation  Waves of translation  Weathering | * Students study wave generation and their characteristics before going on to consider the variety of factors that influence coastal environments. * Processes such as erosion, weathering, transport and deposition are discussed. | Student’s Book: pages 247–54  Teacher’s Guide:   * Key terms * Topic summary * Additional examples: Erosion in southern Nigeria; Changes in part of the oceanside littoral cell, southern California; Human activity and longshore drift in West Africa * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **8.2 Characteristics and formation of coastal landforms** | 7.5 hours | **8.2.1 The role and significance of coastal processes in forming and shaping characteristic landforms and 8.2.2 Erosional landforms**   * Shore platforms, wave-cut platforms, caves, geos, arches and stacks. * Concordant and discordant coastlines.   **8.2.3 Depositional landforms**   * Beaches (cross-section and plan), swash- and drift-aligned beaches, spits, tombolos, barrier beaches.   **8.2.4 Formation and development of landforms influenced by coastal processes and vegetation types**   * Coastal sand dune systems, coastal saltmarsh systems, mangrove swamps. | Arch  Aspect  Barrier beaches  Bay bars  Bayhead beaches  Beach  Berm  Bioconstruction  Cave  Composite cliffs  Compound recurved spit  Concordant (accordant) coastline  Creeks  Cuspate forelands  Cusps  Discordant coastline  Drift-aligned coasts  Dunes  Foreshore  Fulls  Geo  Littoral deposits  Mangroves  Neritic  Offshore bars  Platform / wave-cut platform  Recurved spit  Rias  Salting  Shingle ridge  Shore platform  Spits  Stack  Swales  Swash-aligned coasts  Tidal range  Tombolos | * Erosional and depositional landforms are discussed. * The role of vegetation type is considered in the context of sand dunes, salt marshes and mangrove swamps. | Student’s Book: pages 255–64  Teacher’s Guide:   * Key terms * Topic summary * Additional example: Shore platform at Kaikoura Peninsula, New Zealand * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **8.3 Coral reefs** | 7.5 hours | **8.3.1 Distribution of coral reefs and conditions required for coral growth**   * Coral, reef distribution * Factors affecting coral growth rates: temperature, water depth, light and lack of sediment (for photosynthesis), water oxygenation, salinity. * Symbiotic relationships with algae (zooxanthellae).   **8.3.2 Threats to coral reefs**   * State of coral reefs: climate change, overfishing, destruction and pollution. * Coral bleaching. * Impacts of climate change: marine temperature rise, marine acidification, sea-level rise, increased storm activity, changes in salinity. * Pollution: land- and marine-based. * Physical damage: natural and human action. * Management strategies and evaluation of success in reducing threats, managing the Great Barrier Reef. | Coral  Zooxanthellae | * The distribution and conditions required for growth of coral reefs are discussed. The slow rate of growth and importance of coral reefs for marine ecology and human communities could be considered. * There is a potential link here to the climate change impacts and governance: healthy coral reefs help protect low-lying island nations. * Threats are identified. Pollution could include agriculture runoff, increase in sediments and oil spills. * Physical damage could include tropical storms, tsunamis, shipping, fishing and tourism. * Possible management strategies to protect coral are assessed. | Student’s Book: pages 264–69  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **8.4 Physical and human challenges to the coastal environment** | 7.5 hours | **8.4.1 Detailed specific example of** **a stretch or stretches of coastline**   * Human challenges to the coastal environment, coastal management, hard and soft engineering, and an evaluation of the success of these strategies. | Coastal defence  Gabions  Groynes  Revetments  Rock armour | * In this section, different types of hard and soft engineering should be considered. * A DSE of the how Venice is protected against flooding is provided. | Student’s Book: pages 270–73  Teacher’s Guide:   * Key terms * Topic summary * Additional examples: The USA’s eastern seaboard; Coastal management on the North Norfolk coast, UK * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **Topic 9 Hazardous environments** | 30 hours |  |  |  |  |
| **9.1 Earthquake and volcanic hazards and impacts** | 7.5 hours | **9.1.1 Global distribution of earthquakes and volcanoes and related plate tectonics**   * Spatial distribution of earthquakes. * Spatial distribution of volcanoes.   **9.1.2 Earthquake hazards and their impacts**   * Factors affecting severity of earthquakes: focus and epicentre, types of seismic waves (P-waves and S-waves, Love waves and Rayleigh waves), magnitude and magnitude scales (Richter, Modified Mercalli Intensity and Moment Magnitude), local geology, depth of focus, distance from epicentre, stress on plates. * Main hazards: surface faulting, ground shaking, foreshocks and aftershocks, liquefaction, mass movement, tsunami. * Factors affecting vulnerability to earthquakes. * Impacts of earthquakes.   **9.1.3 Volcanic and hazards and their impacts**   * Processes involved in volcano formation. * Types of volcano: strato volcano (composite cone), shield volcano, cinder cone, lava dome, fissure vents. * Hazards associated with volcanic eruptions: lava flows, tephra and ash falls, volcanic mudflows/lahars, volcanic landslides, pyroclastic flows (nuée ardentes), jökulhlaups, toxic gas. * Measuring volcanoes: volcanic explosivity index (VEI). * Factors affecting vulnerability to volcanoes: speed of flow, size of eruption, frequency, extent, human factors (population density, infrastructure, economic development). * Impacts of volcanoes: on people and the environment including short-term and long-term impacts.   **9.1.4 Management of earthquake and volcanic hazards**   * Predicting earthquakes and volcanic eruptions: techniques and their reliability, precursor events (warning signs) and warning times, instruments used to measure earthquakes and precursor events. * Managing risks: effectiveness of management strategies, perception of risk, prevention, early warning systems, infrastructure design, planning, education and awareness. * Short-term emergency responses and long-term recovery. | Active volcano  Aftershocks  Avalanche  Body waves  Cinder cones  Composite cones (strato volcanoes)  Debris avalanche  Epicentre  Flow failure  Foreshocks  Jökulhlaups  Lahars  Lava domes  Liquefaction / fluidisation  Love waves  Magnitude  Modified Mercalli Intensity scale (MMI)  Moho  Moment Magnitude scale M  P-waves  Pyroclastic flows (nuée ardentes)  Rayleigh waves  Richter scale  Seismic waves  Shadow zone  Shield volcanoes  Surface waves  S-waves  Tsunamis  Volcanic Explosivity Index (VEI) | * This section provides an overview of the distribution of tectonic hazards, the causes and impacts of earthquakes and factors affecting the impact of earthquakes. * Volcanoes and their impacts are considered. * The management of both types of tectonic hazard is addressed. This includes the concept of risk perception, prediction, prevention, and preparation. * Risk and risk reduction, building design and other methods of reducing hazard impact are also discussed. | Student’s Book: pages 274–92  Teacher’s Guide:   * Key terms * Topic summary * Additional example: The Tohoku earthquake and tsunami of 2011, Japan * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **9.2 Tropical cyclone hazards and their impacts** | 7.5 hours | **9.2.1 Global distribution of tropical cyclones**   * Conditions required for tropical cyclones (cyclones, hurricanes, typhoons): sea temperature, seasonality, Coriolis effect, local atmospheric conditions. * Formation and development of tropical cyclones. * Saffir-Simpson (hurricane) Scale of tropical cyclone strength.   **9.2.2 Hazards and impacts**   * Main hazards: high winds, storm surges, coastal flooding leading to saline intrusion, intense rainfall leading to river floods and mass movements. * Physical factors and human factors of vulnerability to tropical cyclone hazards and impacts: strength and extent of tropical cyclone, location of landfall, population density, infrastructure, economic development. * Impacts on people and the environment: short-term impacts and long-term impacts. * Potential impact of climate change on the strength and frequency of tropical cyclones.   **9.2.3 Management of tropical cyclone hazards**   * Predicting cyclones: techniques and their reliability, precursor events (warning signs), monitoring and warning times. * Risk perception. * Managing risks: environmental controls and modification, modifying and siting infrastructure, planning, education and awareness. * Short-term emergency responses and long-term recovery. | Eye  Storm surge  Tropical cyclone  Typhoon | * Tropical cyclones are considered in terms of their global distribution, formation and development. Maps and cross-sectional diagrams make useful tools for this. * Physical and human factors influencing vulnerability are discussed, and their relative importance could be evaluated. * Hazards and impacts of tropical cyclones should be understood, both on people and the environment, as well as in the short term and long term. | Student’s Book: pages 293–98  Teacher’s Guide:   * Key terms * Topic summary * Additional example: Hurricane Patricia * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **9.3 Wildfire hazards and their impacts** | 7.5 hours | **9.3.1 Global distribution of areas at risk of wildfires**   * Conditions influencing wildfire risk: fuel (vegetation type, flammability and density), climatic factors, recent weather conditions. * Physical causes of wildfires: desiccation of vegetation, lightning strikes, sparks from falling rocks. * Human causes of wildfires: accidental occurrence – unattended fires, equipment use/malfunction, rubbish (lenses/glass and discarded cigarettes), deliberate actions – arson.   **9.3.2 Hazards and impacts**   * Wildfire characteristics: the influence of topography and wind. * Measuring wildfires: speed and extent of wildfire spread. * Physical factors and human factors of vulnerability to wildfires and impacts: speed and extent of spread, land use, population density and spread, infrastructure, economic development. * Impacts on people and the environment: short-term impacts and long-term impacts. * Potential impact of climate change on the location, extent and frequency of wildfires.   **9.3.3 Management of wildfire hazards**   * Prediction techniques and their reliability, monitoring and warning times. * The concept of perception of risk. * Managing wildfire risks: modifying the environment, infrastructure design or modification, source of finance, planning, education and awareness. * Short-term emergency responses and long-term recovery. | Fuel bed  Reforestation  Wildfires | * The study of wildfires will be new to many students and so a clear introduction might be necessary. * The conditions influencing wildfire risk should be identified, and both physical and human causes understood. * The characteristics of wildfires should be considered, and factors influencing vulnerability appreciated. * The impacts of wildfires should be investigated, on both people and the environment, as well as in both the short term and long term. * Strategies for management of wildfires should be recognised and their effectiveness evaluated. Differentiation should be made between short-term emergency responses and long-term recovery strategies. | Student’s Book: pages 298–305  Teacher’s Guide:   * Key terms * Topic summary * Additional examples: The impact of fires in the Amazon region; Managing fire risk in Canada * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **9.4 Challenges in multiple-hazard environments** | 7.5 hours | **9.4.1 Detailed specific example of an environment which has multiple hazards (two or more of the following hazards: volcanic, earthquake, tropical cyclones, wildfires):**   * Causes and impacts of the hazards. * Management strategies. * Evaluation of the success of these strategies. |  | * Care should be taken to select a location with two or more hazards so that the syllabus requirement can be met. * The DSE provided is the Philippines, which experiences volcanic and tropical cyclone (typhoon) hazards. The general principles relating to causes and impacts covered in the earlier part of the topic should be applied to the chosen example. * The specific management strategies employed in the example location should be considered, both in terms of their intended role(s), and their actual effectiveness. | Student’s Book: pages 306–08  Teacher’s Guide:   * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **Topic 10 Arid environments** | 30 hours |  |  |  |  |
| **10.1 Arid climates** | 7.5 hours | **Definitions of aridity**  **10.1.1 Global distribution of hot arid and hot semi-arid environments and 10.1.2 Climatic characteristics of hot arid and hot semi-arid environments**   * Distribution of arid environments. * Rainfall: diurnal and seasonal variations in precipitation. * Temperature: diurnal and seasonal variations in temperature. * Wind: high wind energy environments. * Classification of desert climates: hot semi-arid outer tropical climate (Bshw), hot semi-arid: poleward of hot deserts (Bshs), hot arid climates (Bwh).   **10.1.3 Causes of aridity**   * Pressure and wind systems, continentality (distance from the sea), influence of ocean currents, rainshadow effect, human activities. | Aridity  Cold offshore currents  Continentality  Deserts  Rainfall effectiveness  Rainshadow effect  Sheetwash | * The global distribution and climatic conditions of hot arid and hot semi-arid areas are considered, particularly in terms of latitude. * The key features of hot arid and semi-arid are discussed, with seasonal and diurnal variations addressed, for both temperature and precipitation. Direct comparisons could be made in each case. * The causes of aridity are explained, and it would be useful to provide definitions of the two climatic types, including Index of Aridity. | Student’s Book: pages 309–14  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **10.2 Processes and landforms in arid environments** | 7.5 hours | **10.2.1 Weathering processes and their significance in forming and shaping landforms**   * Physical (mechanical) processes: heating/cooling (thermal fracture and exfoliation), freeze–thaw (frost shattering), salt crystal growth, hydration. * Chemical weathering processes: hydrolysis, carbonation.   **10.2.2 Wind (aeolian) processes and their significance in forming and shaping landforms**   * Erosion: abrasion/corrasion, deflation. * Transportation: traction, saltation, suspension. * Deposition.   **10.2.3 Water (fluvial) processes and their significance in forming and shaping landforms**   * Movement of water in arid erosions: hydrological regime, episodic rainfall, sheet floods and flash floods, exogenous rivers, endoreic rivers, ephemeral rivers, duricrusts. * Erosion, transportation and deposition: rainsplash, gullies.   **10.2.4 Characteristics, formation and shaping of landforms**   * Wind erosional landforms: deflation hollows. * Landforms resulting from differential erosion: ventifacts, rock pedestals, yardangs, zeugen. * Wind depositional landforms; sand dunes (seif, star, barchan). * Water erosional landforms: sand dunes, wadis/arroyos, pediments, mesas and buttes, inselbergs. * Water depositional landforms; alluvial fans, bajadas, playas, salt lakes, badlands. | Alluvial fan  Arroyos  Bajada (bahada)  Barchan dunes  Block disintegration  Buttes  Chemical weathering  Chotte (salt lake/playa)  Deflation  Desert pavement  Desert varnish  Disintegration / insolation weathering  Duricrusts  Endoreic rivers  Ephemeral rivers  Episodic rainfall  Erg desert  Exogenous rivers  Gours  Granular disintegration  Gullies  Hammada desert  Hydration  Hydrological regime  Linear dune  Lunette dune  Mesas  Nebkha  Parabolic dune  Pediments  Piedmont zone  Pluvial  Rainsplash  Reg desert  Seif dunes  Sheet floods  Star dunes  Surface creep  Suspension  Thermal fracturing  Ventifacts  Wadis  Yardangs  Zeugen | * Weathering processes are discussed. Candidates may need detailed coverage of this, as it is no longer studied at AS. Processes of erosion, transport and deposition by wind and water are discussed. * Characteristic landforms caused by wind, e.g. sand dunes, and water, e.g. alluvial fans, are described and their formation explained. The relative role of wind and water in deserts is evaluated. | Student’s Book: pages 315–24  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **10.3 Vegetation and soils in arid environments** | 7.5 hours | **10.3.1 Vegetation characteristics in hot arid and hot semi-arid environments**   * Desert ecosystem: biomass productivity, nutrient cycling. * Adaptations of desert plants: adaptations to extreme temperatures, adaptation of plants to physical and physiological drought, reproduction of plants. * The impact of climate and human activities.   **10.3.2 Soils in hot arid and hot semi-arid environments**   * Distinctive soil forming processes. * Characteristics and profiles of arid soils (solonetz, solonchaks). * The impact of climate, vegetation and human activities. | Aridisols  Biomass productivity  Calcrete (caliche)  CO2 fertilisation  Mesic  Physical drought  Physiological drought  Salinisation  Silcrete  Solonchaks  Solonetz  Succulent | * Soils and vegetation in hot arid and hot semi-arid areas are described, and plant adaptations to both types of drought are explained. * Soil characteristics and profiles, including the possibility of salinisation, are explored. * Although climate is the dominant influence on both, human activity is becoming increasing significant, especially in hot semi-arid environments. | Student’s Book: pages 324–27  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **10.4 Changes and challenges in arid environments** | 7.5 hours | **10.4.1 Changes and challenges and their impacts on arid environments**   * Increase in population pressure and changes in land use. * Climate change: threats to agriculture and food security. * Desertification (both natural and human factors) leading to the degradation of soils (salinisation) and vegetation in hot semi-arid environments, managing soil degradation.   **10.4.2 Detailed specific example of one arid environment (either a hot arid or a hot semi-arid environment)**   * Issues affecting the arid environment. * Management strategies and an evaluation of the success of management strategies. | Desertification  Organic farming  Overcultivation  Overgrazing | * A DSE of Dubai in the UAE is provided to study the causes, issues and management of desertification. The management strategies used should be evaluated. | Student’s Book: pages 328–35  Teacher’s Guide:   * Key terms * Topic summary * Additional examples: Population and land-use changes in West Africa; Issues and possible strategies in the Eastern Cape Province of South Africa * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **ADVANCED HUMAN GEOGRAPHY** | | | | | |
| **Topic 11 Climate change: impacts and governance** | 30 hours |  |  |  |  |
| **11.1 Our future global climate** | 10 hours | **11.1.1 Climate projections and the impact on the global climate**   * The Intergovernmental Panel on Climate Change (IPCC). * Five future scenarios (pathways) of projected climate change: very high emissions (5), high (4), intermediate (3), low (2) and very low (1). * Understanding of the five categories in terms of projected amount of global warming by 2100, global changes in greenhouse gas (GHG) emission (increasing emissions, maintaining emissions, emissions rise to a peak then reduce), year emissions rise to a peak or get to, year of net zero emissions (if applicable), the concept of net zero (meaning and importance). * Projections for the future: projections for temperature and precipitation, extreme weather events, beyond 2100.   **11.1.2 Climate change impacts on different environments**   * Cold environments: high latitude (the Arctic and the Antarctic regions), rise in temperature, reduction in snow and ice cover, permafrost melt and methane release, high-altitude areas (where the effects of climate change are often intensified) and extreme cold events and increase in ice storms and snow storms. * Marine environments: impact of temperature rise on coral reefs, sea-level rise and coastal flooding, changes in sea surface temperatures, stratification and changes in global ocean circulation.   **11.1.3 Non-linear change in climate**   * Feedback mechanisms: positive feedback (increasing change), negative feedback (reducing change), problems in accounting for feedback in global warming. * Tipping points in cold, atmospheric and marine environments: projected tipping points related to sea ice and ice sheet loss, permafrost melt and ocean circulation collapse, how tipping points might impact the magnitude and speed of change in cold environments. * Interactions between cold environments, marine environments and atmospheric environments. | Base period  Climate lag  Compound extreme events  Equilibrium  Extreme weather  Feedback  Intergovernmental Panel on Climate Change (IPCC)  Negative feedback  Net zero  Permafrost  Polar vortex  Positive feedback  Shared Socio-economic Pathways  Upper ocean stratification | * Students should have background knowledge and understanding of this topic from their study of Topic 2. They should have an outline knowledge that the Intergovernmental Panel on Climate Change (IPCC) is an intergovernmental research group but are not expected to read IPCC reports or to know details of the representative concentration pathways (RCP) or shared socio-economic pathways (SSPs). * Students should be able to explain the (potential) impacts of climate change on the varied environments specified. * An understanding of concepts relating to feedback loops, dynamic equilibrium and tipping points should be developed and linked to different scenarios. | Student’s Book: pages 336–48  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **11.2 Projected socio-economic impacts of climate change** | 10 hours | **11.2.1 Global socio-economic impacts and their distribution**   * Current and future projected potential impacts: areas of human habitation, food production, property (land and buildings).   **11.2.2 Patterns of human vulnerability to climate change**   * Factors influencing human vulnerability to climate change, environmental factors related to locational vulnerability (low-lying areas vulnerable to storms, areas vulnerable to droughts/flooding, wildfires). * Reliance on sensitive ecosystems. * Historical, political and economic factors. * Locations and people most vulnerable to climate change: least developed countries (LDCs), small scale food producers, low-income households, tropical and sub-tropical small island communities, indigenous peoples and how a combination of factors can lead to increased vulnerability. | Climate debt  Climate reparations  Climate vulnerability  Colonialism  Indigenous peoples  Marginalised communities  Neocolonialism | * Students should understand the socio-economic impacts of climate change and how these vary globally. * The concept of climate change vulnerability should be appreciated and factors influencing variations in this understood. | Student’s Book: pages 348–59  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **11.3 Governance of climate change** | 10 hours | **11.3.1 Governance on a global scale**   * COPs and the UN Framework Convention on Climate Change (UNFCCC). * An overview of the Paris Agreement (COP21 in 2015) to limit the increase in the global average temperature. * COP agreements since 2015: Marrakesh, Bonn, Katowice, Madrid, Glasgow, Sharm El-Sheikh and Dubai.   **11.3.2 Progress and challenges in management of climate change**   * Management of climate change to reduce the amount or impacts of climate change (mitigation strategies) and adapting to the impacts of climate change (adaptation strategies). * Mitigation strategies aiming to get to net zero emissions: targets for sustainable energy production and energy use, carbon offsetting and carbon credit, climate engineering: carbon capture and storage (CCS), solar radiation management, nature-based solutions to increase carbon storage and improve resilience of ecosystems (protection, restoration and improvements). * Adaptation strategies: withdrawal (retreat), compromise (accommodation) and protection.   **11.3.3 Contrasting management strategies**   * The DSE compares Costa Rica and Japan: factors influencing strategies chosen by these countries (including any justice issues). * An evaluation of the challenges and of implementing these strategies. | Adaptive capacity  Carbon credits  Carbon footprint  Climate adaptation  Climate mitigation  Emissions gap  Energy efficiency  Energy intensity  Geoengineering (climate engineering)  Greenwashing  Loss and damage facility  Managed retreat  Nationally determined contributions  Offsetting  Paris Agreement  UN Framework Convention on Climate Change (UNFCCC) | * This is a wide-ranging section that covers many aspects of the governance of climate change at a global scale. * From the Paris Agreement of 2015 through the subsequent COP events, students should be familiar with what agreements were made and how their implementation was planned. Evaluation of the success of these agreements and plans should be undertaken. Differences between strategies of mitigation and adaptation should be recognised. * DSEs of two contrasting countries should be studied, with Costa Rica and Japan provided. | Student’s Book: pages 360–82  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **Topic 12 Environmental issues and management** | 30 hours |  |  |  |  |
| **12.1 Energy supplies** | 10 hours | **12.1.1 Energy resources**   * Types of energy production of electricity, their uses and issues: renewable energy sources: wind, solar, tidal, hydroelectric power (HEP), geothermal, biomass (solid, liquid and gaseous forms). * Global patterns and trends in energy production and consumption. * Future demand. * Non-renewable fossil fuels: coal, oil, natural gas, shale oil and gas, extending the life of fossil fuels, nuclear power. * Renewable energy: hydroelectric power, use of renewable energy sources, wind power, solar power, biomass, geothermal electricity, tidal and wave power, hydrogen fuel cells. * Other sources of domestic energy: combustible fuels such as wood, charcoal, animal dung.   **12.1.2 Challenges of energy transition from fossil fuels to sustainable energy sources**   * Economic and political factors influencing sustainable energy production. * Influence of social factors. * Scale and efficiency of production: storage of energy and connectivity to energy grids at different scales, carbon intensity of electricity. * Energy storage and connectivity to grids: battery energy storage systems. * Decarbonisation of the industrial sector.   **12.1.3 Factors at the national scale affecting demand, supply and sources of energy**   * Variations in energy demand production. * Reasons for variation in production: environmental, political, economic and social factors. * The energy gap. * Energy policy and security: strategic petroleum reserve, energy pathways.   **12.1.4 Energy resources and production at the national scale**   * Detailed specific examples of two contrasting countries’ electrical energy production and sources of energy at the national scale. | Battery energy storage systems (BESS)  Biofuel  Carbon intensity of electricity  Clean coal technologies  Clean-air transition  Coal gasification  Economies of scale  Energy crisis  Energy gap  Energy ladder  Energy mix  Energy pathways  Energy poverty  Energy security  Fossil fuels  Fuel poverty  Fuelwood  Gas flaring  Geopolitics  Geothermal energy  Geothermal gradient  Hydraulic fracturing (fracking)  Non-renewable energy  Peak oil demand  Pollution  Renewable energy  Repowering  Reserves-to-production ratio  Shale oil  Social resistance  Strategic petroleum reserve  Unconventional natural gas  Waste | * Students should be able to differentiate between different types of energy and electricity generation. They should be able to describe and explain global patterns of energy production and consumption. * In some countries the production of non-renewable energy has increased significantly in recent years during the global transition away from fossil fuels. Public opinion has become increasingly important in government decisions relating to energy supply. * Students should appreciate the factors that influence supply and demand at a national scale, with DSEs of two contrasting countries required. Those for China and Sweden are provided. | Student’s Book: pages 383–409  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **12.2 Pollution and environmental degradation in rural areas** | 10 hours | **Pollution: land, air and water**   * Environmental degradation and its impact on human health, examples of incidental pollution, sustained pollution (ozone depletion and skin cancer).   **12.2.1 Activities that cause pollution and degradation in rural areas**   * Rock and mineral extraction (quarrying and mining), rare earth elements, impacts of extractive activities, importance of water in mining processes. * Agricultural practices and related issues: soil degradation, capital-intensive farming, poverty and rural environmental degradation, urban and rural impacts. * Large-scale infrastructure projects.   **12.2.2 Management of pollution and environmental degradation caused by human activities**   * Sustainable practices in rock and mineral extraction: strategies for restoring extractive landscapes, the role of monitoring and legislation. * Sustainable environmental practices in agriculture: practices which conserve resources, improve soil health, encourage and protect natural diversity, sustainable strategies in agriculture.   **12.2.3 Environmental degradation in one rural area**   * Detailed specific example of environmental degradation in one rural area:causes, issues and attempts at management and an evaluation of strategies to manage the environmental degradation. | Acidification  Agro-industrialisation  Arable farms  Capital-intensive farming  Commercial farming  Community conservancies  Community forests  Contour ploughing  Dewatering  Environmental degradation  Eutrophication  Externality  Externality gradient and field  Fallow  Food security  Incidental pollution  Large-scale infrastructure projects  Marginal lands  Mining  Multidimensional poverty  No-till farming  Ozone layer  pH  Precision agriculture  Processing industries  Quarrying  Rare earth elements (REEs)  Scaling-up process  Shelterbelts  Soil degradation  Soils  Sustainable development  Sustained pollution  Terracing  Toxic  Veld | * Students should study the human activities causing different types of pollution in rural areas on a large scale. * They should understand the practices used to manage pollution and environmental degradation, including in one named rural area. * A DSE of Namibia is provided. | Student’s Book: pages 409–25  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **12.3 Pollution and environmental degradation in urban areas** | 10 hours | **12.3.1 The degradation of urban environments**   * Characteristics of the urban environment: building density, high population, transport networks, concentration of economic activity, lack of open spaces. * Air pollution in cities: characteristics of cities related to air pollution, major pollutants (particulates, nitrogen dioxide), patterns in air pollution. * Urban land pollution: similarities and differences between leading causes of urban degradation in LICs, MICs and HICs. * Urban water pollution: contamination of rivers, streams and reservoirs, sources of pollution (domestic, construction, manufacturing industry and power generation, transport and solid and sewage waste).   **12.3.2 Management of pollution and environmental degradation in urban areas**   * Sustainable practices in domestic environments. * Transport-related measures, urban gardens, domestic combustion, industrial pollution, construction, waste management, localised generation and power management, energy conservation.   **12.3.3 Urban planning and controls**   * Strategic urban planning, land-use planning, town/district planning, environmental impact assessments.   **12.3.4 Environmental degradation in one urban area**   * Detailed specific example of environmental degradation in one urban area: causes, issues and attempts at management and evaluation of strategies to manage the environmental degradation. | Community energy  Energy conservation  Environmental impact assessments  Katabatic winds  Land-use planning  Microgeneration  Municipal solid waste  Point source pollution  Sanitary landfills  Smart meters  Smart power grids  Storm water runoff  Strategic urban planning  Town/district planning  Urban land pollution  Urban water pollution | * Students should understand the factors in the pollution and degradation of urban environments. They should be able to explain the practices of management of pollution and degradation, with a particular appreciation of the role of planning controls used at differing scales. * A DSE of Delhi is provided to study the causes, issues and management of urban environmental degradation. The management strategies used should be evaluated. | Student’s Book: pages 425–36  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **Topic 13 Trade, aid and tourism** | 30 hours |  |  |  |  |
| **13.1 Global trade patterns and change** | 10 hours | **13.1.1 Flows and patterns of visible trade**   * Imports and exports: the exchange of goods, trade deficit and trade surplus, invisible trade (trade in services), commodities, globalisation. * Trade in goods: intra-regional trade, trade between ‘types’ of countries. * Major trade routes. * Trade in manufactured goods: intermediate goods and global value chains. * Trade in commodities: agricultural, oil and natural gas and minerals.   **13.1.2 Factors influencing patterns of visible trade**   * Physical and historical factors: resource endowment and other geographical advantages, geographical location, workforce structure, financial resources and infrastructure, the impact of colonialism, neo-colonialism and levels of socio-economic development, the roles of trade and investment in development. * Economic and political factors: changes in supply and demand for commodities, developments in logistics (transport infrastructure and Information technology and communication technology (ICT)), investment, regional trade blocs, bilateral agreements, protectionist policies and price setting, the role of transnational corporations (TNCs) in global production networks including TNCs from newly emerging economies (NEEs).   **13.1.3 The benefits and challenges of global trade**   * Detailed specific examples of two contrasting countries (one of which has a dependence on export of commodities): a comparison of the benefits and challenges of global trade for these countries. | Balance of trade  Capitalism  Chokepoint  Collusive international agreements (cartels)  Commodities  Commodity dependent  Debt  Debt service ratio  Deep sea ports  Deglobalisation  Dependency theory  Development  Diffusion  Digital tracking systems  Economic core region  Economic periphery  Entrepots  Exports  Free trade  Global value chains (GVCs)  Globalisation  Goods  Imports  Intermediate goods  Inter-modal transport terminals  Intra-regional trade  Invisible trade  Logistics parks  Primary products  Protectionism  Resource endowment  Secondary products  Tariffs  Trade  Trade barriers  Trade bloc  Trade deficit  Trade in goods (merchandise)  Trade in services  Trade surplus  Ultra-large container ships (ULCS)  UNCTAD (UN Conference on Trade and Development)  Visible trade | * Students should be able to describe and explain global flows and patterns of trade. * Trade is a vital aspect of economic development and globalisation, but some countries have been able to use the world trading system to their advantage more than others. * Contrasting DSEs of Japan and Australia are provided. | Student’s Book: pages 437–57  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **13.2 International organisations involved in trade and aid** | 10 hours | **13.2.1 The role and impact of inter-governmental organisations**   * The World Trade Organization (WTO) and United Nations Conference on Trade and Development (UNCTAD): promotion of trade between countries, dealing with issues and disputes, monitoring and promoting free trade and trade facilitation measures, protecting intellectual property rights. * The Aid for Trade initiative.   **13.2.2** **International aid**   * Different types of international aid and aid donors: humanitarian aid, development aid, tied aid, bilateral aid and multilateral aid. * Impacts of international aid: on receiving countries, on donor countries. * Top-down and bottom-up approaches. | Bilateral aid  Bottom-up strategies  Development aid  Humanitarian aid  Intellectual property  Intermediate technology  International aid  Multilateral aid  Tied aid  Top-down approaches  Trade disputes | * This section focuses on two major global issues, trade and aid, about which there is a wide range of opinion. The contemporary nature of these issues provides many recent examples for students to consider. * Students should understand the roles international organisations on global trade and on aid. There is a wide spectrum of views as to the efficiency and fairness of the current global trading system and the role of the WTO. * Students should evaluate the roles of these organisations and appreciate that some HICs have a much better record on the issues of debt and aid than others. | Student’s Book: pages 457–62  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **13.3 International tourism** | 10 hours | **13.3.1 Patterns and trends in international tourism**   * Tourism patterns: characteristics of people travelling internationally, volume of tourism, value (invisible trade) of tourism flows, patterns in sources and destinations, seasonality. * Factors influencing patterns in tourism: affordability and developments in transport, the importance of ICT, TNC involvement in hotel and resort development, variations in the level of tourism over time and space. * Trends in types of tourism: different types of tourism – business, recreational and sport, seasonal, medical, ecotourism, cultural and heritage.   **13.3.2 The impacts of tourism**   * Social and cultural impact: changing community structure. * Carrying capacity. * Economic impact. * Environmental impact: negative environmental impacts, positive environmental impacts. * Issues of sustainability: considerations for visitors, balancing impacts, environmental claims made by destinations and resorts, impact of climate change on tourism.   **13.3.3 Managing tourism**   * Detailed specific examples of two contrasting tourist areas or resorts (one of which attractsa large number of international tourists): development, impacts of tourism and an evaluation of the success of attempts to manage tourism in these two tourist areas or resorts. | Carrying capacity  Community tourism  Conflict/dark tourism  Cultural tourism  Destination footprint  Economic leakages  Ecotourism  External shocks  Heritage tourism  Host culture  International tourist arrivals  International tourist receipts  Medical (health) tourism  Niche tourism  Package tours  Pro-poor tourism  Religious tourism  Shoulder season  Slow travellers  Sports and recreational tourism  Sustainable tourism  Tourism  Tourist enclaves  Tourist-generating countries  Travel motivators  Urban tourism  Volunteer tourism | * This section looks at how international tourism is a major aspect of globalisation and development. It is a key example of the growing importance of services to national economies and to the global economy. * Students should recognise the increasing variety of motivators for tourism. Apart from economic implications, tourism has considerable social and environmental impacts which students should be able to describe and explain. * The concept of carrying capacity is an important one, and students should understand and apply its principles to any destination studied. * DSEs of Aruba and Corfu are provided, both of which require evaluation of the success of strategies to manage tourism. | Student’s Book: pages 462–82  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **Topic 14**  **Disease and geography** | 30 hours |  |  |  |  |
| **14.1 Distribution of diseases** | 10 hours | **Health and disease**   * Definitions of disease and human health and classifications of disease.   **14.1.1 Geography of disease**   * Exposure and risk. * Describing the incidence of disease: outbreak, epidemic, pandemic. * Transmission of disease – the role of models. * Social measures of disease impact: prevalence, prevalence rate, mortality rates, life expectancy, morbidity (people with a disease), death rate, infant mortality rate, life expectancy, with reference to age/sex structure diagrams. * Economic measures of disease impact: gross domestic product (GDP) spending on healthcare, workforce issues.   **14.1.2 Distribution of disease and spatial variation in morbidity**   * The distribution of disease: effect of national income group, similarities and differences between leading causes of death (as categorised by the WHO for LICs, MICs and HICs), temporal changes. * Factors influencing spatial variation in health and morbidity: demographic variations, environmental factors (climate, water quality and quantity, environmental conditions that disease-carrying insects/animals (vectors) need, sanitation and healthcare infrastructure), the impact of disaster events (flooding, hurricanes, earthquakes), social influences (living conditions, diet, education and behaviours) and economic influences (poverty/affluence affecting diet, lifestyle and health, occupation, economic development) and healthcare infrastructure (investment and vulnerability), infant mortality in the USA, distance and accessibility, global interconnectedness and political factors (governance, international relations and investment). | Age/sex structure diagrams  Age-specific mortality rate  Age-standardised mortality rate  Climate stressors  Core  Core-periphery  Disease  Disease outbreak  Epidemic  Epidemiological transition  Epidemiology  Exposure  Global disease burden  Health systems  Healthcare infrastructure  Human health  Maternal mortality rate  Morbidity  Multifactorial diseases  Neonatal mortality rate  Pandemic  Periphery  Population displacement  Prevalence  Prevalence rate  Primary healthcare  Socio-economic status  Strain  Susceptible population  Threat multiplier  Vector-borne diseases | * Students may not have encountered this topic before, and so care must be taken to ensure a sound grounding is gained at the start. The focus should be on the environmental, social, economic and political aspects of disease. * Students are not expected to have a detailed understanding of the medical and biological aspects of disease. * Students will need to learn and correctly use a lot of technical terminology, although defining terms will not form part of the assessment. | Student’s Book: pages 483–503  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **14.2 Pathogenic diseases, their spread and impacts** | 10 hours | **14.2.1 Influenza: a viral disease**   * Transmission and spread: threat to populations and distribution – how influenza (flu) is transmitted. * Prevalence and risk factors. * Treatment and vaccines. * Global distribution: spatial and temporal variations. * Social and economic impacts. * Risks associated with human and animal variants: antigenic drift, antigenic shift, zoonotic influenza viruses, continuing research. * Detailed specific example of the strategies used by one country to prevent and control influenza.   **14.2.2** **Cholera: a bacterial disease**   * Transmission and spread. * Prevalence and risk factors. * Global distribution and spatial variation. * Social and economic impacts of cholera. * Potential risks from disaster events. * International co-operation. * Detailed specific example of the strategies used by one country to prevent and control cholera.   **14.2.3 Malaria: a parasitic disease spread by a vector**   * Transmission and spread: threat to populations, factors influencing spread. * Prevalence and risk factors. * Global distribution, spatial variation and changing environmental conditions. * Social and economic impacts. * Prevention and elimination. * Surveillance and the WHO Global Technical Strategy for Malaria 2016-2030. * Detailed specific example of the strategies used by one country to prevent and control malaria. | Antigenic drift  Antigenic shift  Endemic  Incubation period  Seasonal epidemics  Zoonotic | * Students do not need to know details of different types of human influenza. * They should have an outline knowledge that the changing types/strains of influenza impact the spread, effectiveness of vaccines and epidemic/pandemic potential. * DSEs are provided for influenza (Vietnam), cholera (Bangladesh) and malaria (Nigeria). | Student’s Book: pages 503–18  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |
| **14.3 Monitoring and response to pathogenic disease** | 10 hours | **14.3.1 Monitoring disease to control public health emergencies**   * Factors that influence effective disease. * Passive, active and integrated surveillance: notifiable diseases. * General factors influencing effective disease monitoring: cost-effective testing, access and scalability of testing technology, data accuracy, access to patients, disclosure and patient confidentiality, international relations (collaborations), the ‘100 Days Mission’, New Variant Assessment Platform (NVAP). * Controls of disease: vaccines, sanitation infrastructure, education, low technology strategies (oral rehydration therapy, mosquito nets, face masks).   **14.3.2 Responses to disease outbreaks**   * Factors influencing effective responses: main factors affecting readiness and responsiveness of countries during epidemic and pandemic crises. * The Covid-19 pandemic: different responses. * Detailed specific examples of two contrasting countries’ responses to one pandemic since 1970 – similarities and differences in responses to the pandemic and factors influencing effective responses (environmental, social, economic, political).   **14.3.3 A critical evaluation of a global programme to eradicate one pathogenic disease**   * With reference to environmental, social, economic or political reasons for potential re-emergence. | Active surveillance  Excess mortality  Integrated surveillance  Measles elimination  Notifiable diseases  Open defecation  Passive surveillance  Surveillance (monitoring) | * Students should consider a range of diseases and their monitoring and develop an understanding of the factors influencing the effectiveness of the actions taken. * DSEs of contrasting responses to the COVID-19 pandemic are provided for China and Sweden. * The example provided of a global eradication programme is measles. Students should critically evaluate this programme. | Student’s Book: pages 518–33  Teacher’s Guide:   * Key terms * Topic summary * Suggested websites * Knowledge Test * Figures/tables from the Student’s Book |