OXFORD
INTERNATIONAL
AQA EXAMINATIONS

# INTERNATIONAL AS GEOGRAPHY

## (9635)

## Schemes of work

Physical geography 1: Coastal systems and landscapes

This scheme of work is not exhaustive or prescriptive; it is designed to suggest activities and resources that you might find useful in your teaching.

# 3.1 Physical geography

## Core topic

## 3.1.3 Coastal systems and landscapes

| Specification content<br><br>Week number | Subject specific skills development | Learning outcomes | Suggested learning activities (including ref to differentiation and extension activities) | Resources |
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| **Week 1**<br><br>**Coasts as natural systems**<br><br>Systems in physical geography:<br><br>Systems concepts and their application to the development of coastal landscapes – inputs, outputs, energy, stores/components, flows/transfers, positive/negative feedback, dynamic equilibrium. | Use of key subject specific and technical terminology.<br><br>To identify **connections** and interrelationships between different aspects of geography.<br><br>Constructing and using systems and models.<br><br>Labelling and annotation of diagrams. | Students will have an understanding of the concept of '**systems frameworks**' as a type of model fundamental to most areas of geographical understanding.<br><br>Students will be able to identify, describe and explain the elements of geographical systems, including:<br><br>• stores/components<br>• flows/connections<br>• elements<br>• attributes<br>• relationships<br>• boundaries<br>• inputs | Get students to develop background reading into the systems approach to geography - an overview of the concept and use of 'models' by geographers as simplifications of a complex world.<br><br>Small group discussions followed by feedback - what models used in geography do students know?<br><br>Students to draw and annotate a model system to show the key elements of a system. Use key word flash cards/card sort to now make this applicable to the coast as a system. Use this to discuss the concept of open, closed | Simple summaries of a number of earth systems: **eo.ucar.edu/kids/green/cycles1.htm** |

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| | | • outputs<br>• flows.<br><br>Students will understand that coasts are open systems.<br><br>Students will understand systems as being in a state of dynamic equilibrium that includes:<br><br>• positive feedback<br>• negative feedback. | and inter related systems.<br><br>Students to draw and annotate a diagram of an example of a positive feedback system and a negative feedback system.<br><br>Practice low-tariff exam questions to assess learning – peer assessment opportunity.<br><br>Reap the desert as a system – involve asking pupils to complete diagrams using flash card words and images<br><br>Ask pupils to code ideas into categories eg the stores, the flows etc. | Chorley and Kennedy show how systems can be used to look at physical geography: **paei.wikidot.com/chorely-kennedy-systems-approach-to-physical-geography**<br><br>Some material from Penn State is useful to give an overview of systematic geography: **e-education.psu.edu/geog571/node/382**<br><br>Introductory presentation on natural systems: **prezi.com/waun8urselvh/**<br><br>The British Geographer looks at coastal systems clearly: **thebritishgeographer.weebly.com/coastal-processes.html**<br><br>Some nice images are available to analyse the coast as a system, such as Australian coastal management – which covers multiple processes interacting on the coast: **hdimagelib.com/coastal+erosion+diagram**<br><br>**australiancoastalmanagement.weebly.com/geographical-processes.html**<br><br>Linked to climate change on the coast a positive feedback loop: |

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| | | | | **climateemergencyinstitute.com/uploads/self_feedback_loop.png**<br><br>Professor Simon Haslett has a range of clips covering coastal systems: **youtube.com/watch?v=vb8pgT39vE8**<br><br>Demonstrate and discuss systems approach using the World Bank's video on climate change's influence on the Philippine coast: **youtube.com/watch?v=U1XGxo3vB2Q** |
| **Coasts as natural systems**<br><br>The concepts of landform and landscape and how related landforms combine to form characteristic landscapes. | Use of key subject specific and technical terminology.<br><br>To identify **connections** and interrelationships between different aspects of geography.<br><br>Constructing and using **systems** and models.<br><br>Labelling and annotation of diagrams.<br><br>Develop an understanding of the | **Coasts as characteristic landscapes**<br><br>Students will all understand the concepts of:<br><br>• landform<br><br>• landscape.<br><br>Students will appreciate that characteristic desert landscapes are the combination of related landforms. Students will visit the idea of distinctive coastal landscapes resulting from a combination of related landforms. | Discuss what represents a characteristic coastal landscape and the differences between sandy coast, pebble beaches etc.<br><br>Expand to basics of what creates these – weathering, erosion, transport and deposition – basic annotation of coastal landscapes and the processes which shape these. Perhaps use postcards from the local area and photographs from the class to make this more representative. | Look at a variety of landscapes eg the Scottish coastal landscape shown on this video by the BBC: **youtube.com/watch?v=HRkn5mmP4Ig**<br><br>Discovery of landscapes using travel brochures of coastal areas and tourism video adverts eg Thailand: **youtube.com/watch?v=ZP2nKrhEU68**<br><br>National Geographic coast line images: **science.nationalgeographic.com/science/earth/surface-of-the-earth/coastlines-article/** |

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| | concept of '**landscape**'. | | Look at the role of sediment/littoral cells for erosion and deposition and link these into coastal systems and example of a positive or negative feedback in a desert landscape.<br><br>(Specific landforms and landscapes are studied in detail later). | |
| **Weeks 2–3**<br><br>**Systems and processes**<br><br>Sources of energy in coastal environments: winds, waves (constructive and destructive), currents and tides. Low energy and high energy coasts. | Use of key subject specific and technical terminology.<br><br>Opportunities to develop skills such as drawing, researching, labeling and annotating diagrams. | Students will be able to identify and analyse the characteristics of the sources of energy in coastal systems, including:<br><br>• waves (constructive and destructive)<br><br>• winds<br><br>• currents<br><br>• tides.<br><br>Students will be able to compare and contrast high and low energy coasts. Students will be able to identify different zones of the coastline, to include: | Construct a diagram to illustrate the different coastal zones.<br><br>Paired/small group discussion to identify sources of energy at the coast.<br><br>Students to explore energy at the coast including:<br><br>• Wind – idea of fetch, and global pattern of major winds – opportunity to study atlas maps to identify coasts exposed to large and small fetch.<br><br>• Waves – discuss the characteristics of waves. Opportunity to use the | Professor Simon Haslett has a range of clips covering coastal systems: **youtube.com/watch?v=vb8pgT39vE8**<br><br>Summary of fetch and the effect of wind: **geography-site.co.uk/pages/physical/coastal/fetch.html**<br><br>Interactive map of current surface winds: **earth.nullschool.net/**<br><br>Summary of wave formation: **oceanexplorer.noaa.gov/facts/waves.html**<br><br>Video explanation of many aspects of the features of waves: **oceanexplorer.noaa.gov/edu/learning/player/lesson09.html**<br><br>Simple map of major ocean currents: |

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| | | • backshore<br>• foreshore<br>• inshore<br>• offshore<br>• nearshore<br>• swash zone<br>• surf zone<br>• breaker zone.<br><br>To explore these using a systems approach. | internet, text or virtual learning environment (VLE) resources to research the characteristics of waves. Construct diagrams of the characteristics of waves.<br><br>• Research constructive and destructive waves – annotate photographs and diagrams to identify characteristics.<br><br>• Use atlas or internet maps to produce a map of ocean currents, accompanied by video notes to describe/explain the pattern of ocean currents.<br><br>Practice low-tariff exam questions to assess learning – peer assessment opportunity. | **physicalgeography.net/fundamentals/8q_1.html**<br><br>Exploration of the causes and effects of surface ocean currents: **oceanservice.noaa.gov/education/kits/currents/05currents1.html**<br><br>Exploration of ocean currents in coastal areas: **oceanservice.noaa.gov/education/kits/currents/03coastal1.html**<br><br>Detailed video explanation of ocean currents: **oceanexplorer.noaa.gov/edu/learning/player/lesson08.html**<br><br>3 minute video on motion in the ocean covering tides and ocean currents: **oceanservice.noaa.gov/facts/current.html**<br><br>Detailed video exploring tides, with links to activities and other information about tides: **oceanexplorer.noaa.gov/edu/learning/player/lesson10.html**<br><br>A summary of wave characteristics, including high and low energy coastlines: **geography-fieldwork.org/a-level/coasts/** |
| **Systems and** | Use of key subject specific and technical | Students will be able to identify the sources of | Question and answer session/paired discussion | *Geofile 537* article looks at littoral cells |

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| **processes**<br><br>Sediment sources, cells and budgets – make a link to littoral/longshore drift. | terminology.<br><br>Opportunities to develop skills such as drawing, labelling and annotating diagrams.<br><br>Opportunity to measure/study real or virtual longshore drift.<br><br>Using a range of maps and images to identify coastal processes and feedback loops.<br><br>Opportunity to apply systems theory to identify the inputs, processes, and outputs operating at the coastal zone. | sediment for the coastal system, including:<br><br>• rivers and streams reaching the coast<br><br>• estuaries<br><br>• cliff erosion<br><br>• offshore sand banks<br><br>• material from a biological origin.<br><br>Students identify the features of coastal sediment cells – to understand these using a systems approach.<br><br>Understanding of the concept of the coastal sediment budget, including:<br><br>• positive budgets<br><br>• negative budgets.<br><br>To explore these using a systems approach. | about where sediment in coasts comes from and how coasts can be both sources and sinks for sediment.<br><br>Use satellite images and maps to identify littoral cells in local area.<br><br>Following an introduction to sediment cells, research the sediment cells and sub cells of……. (your choice – UK is well covered) - identify these on an outline map, then identify and map the characteristics of the most local cell.<br><br>Draw simple flow diagrams to illustrate the concepts of a positive and negative sediment budget.<br><br>Practice low-tariff exam questions to assess learning – peer assessment opportunity. | in Norfolk.<br><br>*Geofact sheet 141* shows a littoral cell off the Holderness coast in the UK.<br><br>Maps of the sediment cells of England and Wales are easy to find online.<br><br>US Geological Survey information on coastal land loss and sediment budgets: **pubs.usgs.gov/of/2003/of03-337/budget.html**<br><br>Littoral cells covered well: **coastalchange.ucsd.edu/st3_basics/littoralcell.html**<br><br>Short video on where coastal sediment comes from: **youtube.com/watch?v=HHcFiI8rx_g**<br><br>US Geological Survey information on sediment cells and budgets: **pubs.usgs.gov/of/2008/1206/html/processes1.html**<br><br>Santa Cruz littoral cell example: **montereybay.noaa.gov/resourcepro/resmanissues/crsmp-sc.html**<br><br>A very simple summary of longshore drift: **onegeology.org/extra/kids/earthprocesses/longshoreDrift.html** |

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| | | | | Short animation of longshore drift: **youtube.com/watch?v=f-Z8FwDLQL8**<br><br>A guide to completing an investigation into longshore drift: **rgs.org/OurWork/Schools/Fieldwork+and+local+learning/Planning+your+fieldtrip/Fieldwork+locations/Jurassic+Coast+of+Dorset+and+East+Devon/Longshore+drift+investigation.htm** |
| **Systems and processes**<br><br>Distinctively coastal processes: marine: erosion – hydraulic action, wave quarrying, corrasion/ abrasion, cavitation, solution, attrition<br><br>Linked to:<br><br>**Coastal landscape development**<br><br>Study of a variety of landscapes from beyond the United Kingdom (UK) but may also include UK examples.<br><br>Origin and development | Use of key subject specific and technical terminology.<br><br>Develop knowledge and understanding of a range of related landforms that combine to form distinctive coastal landscapes.<br><br>To identify connections and interrelationships between different aspects of geography.<br><br>Opportunities to develop skills such as drawing, labelling and | Students will understand that coastlines are affected by two main sets of geomorphological processes:<br><br>• marine processes, including:<br><br>  • marine erosion – hydraulic action; Wave quarrying; abrasion/corrasion; attrition; contribution of solution/corrosion.<br><br>Students will be able to describe the characteristics and analyse the factors and processes in the development of landforms and landscapes | Show a video clip showing destructive waves – questioning on the impact of this on landscapes.<br><br>Question and answer session/paired discussion – what is the role of waves on the coast? Ensure students have notes on how waves erode, transports and deposits sediment to set the scene.<br><br>Look at the various types of erosion and draw diagrams to represent hydraulic action etc.<br><br>Use a variety of images to identify marine eroded landforms. Use research to | Video introduction to processes of coastal erosion: **youtube.com/watch?v=zUh3WeilFN4**<br><br>Brief summary of a range of coastal processes including a short video clip illustrating fluvial transport: **alevelgeography.com/marine-processes/**<br><br>Simple resources about various aspects of the coast with many effective images and a range of video clips and diagrams: **3dgeography.co.uk/**<br><br>Video clip discussing **factors affecting coastal erosion and resultant landforms**<br><br>**How erosional landforms are linked** |

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| of landforms and landscapes of coastal erosion: cliffs and wave cut platforms, cliff profile features including caves, arches and stacks; factors and processes in their development. | annotating diagrams.<br><br>Opportunity to analyse and present geographical data employing a variety of graphical techniques and descriptive statistics (see skills checklist). | of coastal erosion, including:<br><br>• cliffs and wave cut platforms<br><br>• cliff profile features – caves, arches and stacks. | explain their formation and discuss their characteristics.<br><br>For each marine eroded landform listed in the specification use a range of resources to produce a revision card/sheet (or electronic resource). To include:<br><br>• annotated sketch/ diagram showing its characteristics<br><br>• a flow diagram giving a sequenced explanation of formation – explaining processes in their development<br><br>• factors affecting their formation<br><br>• reference to inputs, processes and outputs of coastal landscapes<br><br>• a named illustrative example (not developed case study)<br><br>• a summary of the timescales involved in the formation of the | with the impacts of climate change<br><br>Coastal erosion is widely covered in a range of paper or online resources.<br><br>Video presentation of the effects of coastal erosion including animations of erosional features. |

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| | | | landforms and subsequent landscapes of which they are a part.<br><br>Again there are opportunities to visit a local coast and investigate which are the dominant landforms, linked to the processes that create them. Identify an area of the coast dominated by coastal erosion and the individual landforms that have combined to form the distinctive landscape they see. (There is an opportunity to investigate landforms/landscapes in the field).<br><br>Practice mid-tariff exam questions to assess learning and create own questions from the learning – ie looking at photographs and diagrams to analyse the interactions between processes and landscapes. | |
| **Systems and processes**<br><br>Distinctively coastal processes: | Use of key subject specific and technical terminology.<br><br>Develop knowledge | Students will understand that coastlines are affected by two main sets of geomorphological processes | In pairs/small groups research the processes of marine transportation and deposition and produce a | Brief summary of a range of coastal processes including a short video clip illustrating fluvial transport: **alevelgeography.com/marine-** |

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| transportation: traction, suspension (longshore/littoral drift) and deposition<br><br>Linked to:<br><br>**Coastal landscape development**<br><br>Study of a variety of landscapes from beyond the United Kingdom (UK) but may also include UK examples.<br><br>Origin and development of landforms and landscapes of coastal deposition. Beaches, simple and compound spits, tombolos, offshore bars, barrier beaches and islands and sand dunes; factors and processes in their development. | and understanding of a range of related landforms that combine to form distinctive coastal landscapes.<br><br>To identify connections and interrelationships between different processes and landforms.<br><br>Opportunities to develop skills such as drawing, labeling and annotating diagrams.<br><br>Opportunity to analyse and present geographical data employing a variety of graphical techniques and descriptive statistics (see skills checklist). | (marine and sub aerial):<br><br>• marine processes, including:<br>  • marine transportation – traction; saltation; suspension; solution; longshore/littoral drift<br>  • marine and aeolian deposition.<br><br>Students will be able to describe the characteristics and analyse the factors and processes in the development of landforms and landscapes of coastal deposition, including:<br><br>• beaches<br>• simple and compound spits<br>• tombolos<br>• offshore bars<br>• barrier beaches and islands<br>• sand dunes. | revision resource: mind-map/PowerPoint/Prezi presentation/animation/ information sheet/poster etc.<br><br>Construct annotated diagram to illustrate the process of longshore/littoral drift.<br><br>Question and answer session to think about the conditions under which material is deposited at the coast – may wish to think about wave and wind action.<br><br>Possible fieldwork investigation into a range of these coastal processes on a local beach.<br><br>Look at videos of flooding in river areas to initiate discussion about the role of water.<br><br>Match up 3 types of rivers to examples from maps.<br><br>Opportunity to assess learning with a range of exam style questions – | **processes/**<br><br>A very simple summary of longshore drift: **onegeology.org/extra/kids/earthprocesses/longshoreDrift.html**<br><br>Short animation of longshore drift: **youtube.com/watch?v=f-Z8FwDLQL8**<br><br>A guide to completing an investigation into longshore drift: **rgs.org/OurWork/Schools/Fieldwork+and+local+learning/Planning+your+fieldtrip/Fieldwork+locations/Jurassic+Coast+of+Dorset+and+East+Devon/Longshore+drift+investigation.htm**<br><br>Simple introduction to coastal deposition but also has links to landforms, climate change and fieldwork ideas: **yourclimateyourlife.org.uk/a_coasts_dep.html**<br><br>Brief summary of a range of coastal processes including a short video clip illustrating fluvial transport: **alevelgeography.com/marine-processes/**<br><br>Summary of some depositional |

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| | | | could involve some peer assessment.<br><br>For each landform resulting from marine transport and deposition listed in the specification, use a range of resources to produce a revision card/sheet (or electronic resource). To include:<br><br>• annotated sketch/ diagram showing its characteristics<br><br>• a flow diagram giving a sequenced explanation of formation – explaining processes in their development<br><br>• factors affecting their formation<br><br>• reference to inputs, processes and outputs of coastal landscapes<br><br>• a named illustrative example (not developed case study)<br><br>• a summary of the timescales involved in the formation of the | features:<br>**earthonlinemedia.com/ebooks/tpe_3e/coastal_systems/coastal_processes_landforms_depositional.html**<br><br>Information on coastal deposition with in-depth text and interesting images and photos:<br>**opentextbc.ca/geology/chapter/17-3-landforms-of-coastal-deposition/**<br><br>There is a good *Geo Factsheet* on coastal deposition.<br><br>Videos on coastal sand dunes and sand dune formation:<br>**youtube.com/watch?v=OiAs1-VCsXs&nohtml5=False**<br><br>**youtube.com/watch?v=gKU1K8n6jYM** |

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| | | | landforms and subsequent landscapes of which they are a part.<br><br>Again there are opportunities to visit a local coast and investigate which are the dominant landforms, linked to the processes that create them. Then identify an area of the coast dominated by deposition and identify the individual landforms that have combined to form the distinctive landscape they see. (There is an opportunity to investigate landforms/landscapes in the field). | |
| **Systems and processes**<br><br>Distinctively coastal processes: sub-aerial weathering, mass movement and runoff. | Use of key subject specific and technical terminology.<br><br>Develop knowledge and understanding of a range of related landforms that combine to form distinctive coastal landscapes.<br><br>To identify | Students will understand that coastlines are affected by two main sets of geomorphological processes (marine and sub aerial):<br><br>• marine processes, including:<br><br>  • marine transportation – traction; saltation; suspension; solution; | Create match up activity of key terms.<br><br>Use photographs and sources to identify where mass movement and other sub aerial processes have affected a coastline.<br><br>Make connections and links with erosion and deposition. Look at landforms that show | Summary information and video clips of sub-aerial weathering and mass movement: **alevelgeography.com/sub-aerial-processes/**<br><br>Lesson ideas for many aspects of coastal processes including weathering and mass movement: **radicalgeography.co.uk/CCEACoasts.html** |

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| | connections and interrelationships between different aspects of geography. | longshore/littoral drift<br>• marine and aeolian deposition<br>• Sub-aerial processes, including:<br>• sub-aerial weathering – mechanical/physical; biological; chemical<br>• mass movement – landslides; rock falls; mudflows; rotational slip/ slumping<br>• runoff. | connection of sub aerial and marine erosion processes. | |
| **Weeks 4–5**<br><br>**Coastal landscape development**<br><br>This content must include study of a variety of landscapes from beyond the UK but may also include UK examples.<br><br>Estuarine mudflat/saltmarsh environments and associated landscapes; factors and processes in their development. | Use of key subject specific and technical terminology.<br><br>Develop knowledge and understanding of a range of related landforms that combine to form distinctive coastal landscapes.<br><br>Opportunities to develop skills such as drawing, labeling and annotating diagrams. | Students will be able to describe the characteristics and analyse the factors and processes in the development of estuarine mudflat/saltmarsh environments and associated landscapes. | For each of estuarine mudflats and saltmarsh environments students should follow the same approach as above and use a range of resources to produce a revision card/sheet (or electronic resource).<br><br>A named illustrative example (not developed case study) from UK area and one from beyond the UK - identify an area of mudflats and saltmarsh and identify the individual | Professor Simon Haslett has a range of videos about estuaries and estuarine environments: **youtube.com/watch?v=J5C3JRWrQWo**<br><br>Basic ideas on saltmarshes, mudflats etc: **geography-site.co.uk/pages/physical/coastal/mudflats.html**<br><br>Science direct explains formation in systems style approach: **sciencedirect.com/science/article/pii/S027843430000039X** |

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| | | | features that have combined to form the distinctive landscape they see.<br><br>Opportunities to assess all aspects with a full range of exam style questions, including peer assessment to link ideas. | Estuarine mudflats in Pembrokeshire: **pembrokeshirecoast.org.uk/?PID=149**<br><br>Background information on mudflats: **geography-site.co.uk/pages/physical/coastal/mudflats.html**<br><br>Summary of saltmarshes: **geography-site.co.uk/pages/physical/coastal/saltmarsh.html**<br><br>Simple animation illustrating the locational relationship between mudflats and saltmarshes: **oceanservice.noaa.gov/education/kits/estuaries/media/supp_estuar06a_saltmarsh.html**<br><br>Video of estuarine environments in Cardigan Bay in west Wales: **youtube.com/watch?v=LGOECERzlws**<br><br>Estuarine environment beyond the UK: saltmarshes in the USA: **youtube.com/watch?v=3HXyTMnj7ac**<br><br>Videos giving aerial views of estuarine mudflat and salt marsh landscapes at Morecambe Bay: **gettyimages.co.uk/detail/video/crossing-morecambe-bay-stock-video-** |

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| | | | | **footage/558298865**<br><br>**gettyimages.co.uk/detail/video/morecambe-bay-stock-video-footage/559381239** |
| **Coastal landscape development**<br><br>This content must include study of a variety of landscapes from beyond the UK but may also include UK examples.<br><br>Eustatic, isostatic and tectonic sea level change: major changes in sea level in the last 10,000 years.<br><br>Link to:<br><br>**Coastal landscape development**<br><br>Recent and predicted climatic change and potential impact on coasts. The relationship between process, time, landforms and landscapes in coastal | Use of key subject specific and technical terminology.<br><br>Develop knowledge and understanding of a range of related landforms that combine to form distinctive coastal landscapes.<br><br>To identify connections and interrelationships between different aspects of geography.<br><br>Opportunities to develop skills such as drawing, labeling and annotating diagrams.<br><br>Opportunity to analyse and present geographical data employing a variety of graphical techniques | Students will understand the causes and impacts of eustatic, isostatic and tectonic sea level change, especially major changes in sea level in the last 10,000 years.<br><br>Understanding of the nature and causes of recent and predicted climate change and the potential impact on coasts.<br><br>Students will explore the relationship between process, time, landforms and landscapes in coastal settings. | Question and answer session/group discussion – what are the reasons for sea level rising and falling? What are the reasons for global and more localised changes in sea level? What impact might this have on landscapes and landforms?<br><br>Establish definitions of 'eustatic' and 'isostatic' sea level change, and the role played by tectonic processes via video clips and research.<br><br>Use old and projected maps to identify sea level throughout the last 10,000 years. Look at examples via pictures.<br><br>Opportunity for a group research task – students given/find a range of resources on predicted future sea level rise. | Demonstrate and discuss systems approach using the World Bank's video on climate change's influence on the Philippine coast: **youtube.com/watch?v=U1XGxo3vB2Q**<br><br>Intergovernmental Panel on Climate Change (IPCC) videos on climate change 2013 video provides good general background: **ipcc.ch/news_and_events/multimedia.shtml**<br><br>IPCC presentation on possible impacts of climate change on sea levels: **ipcc.ch/pdf/unfccc/cop19/3_gregory13sbsta.pdf**<br><br>Maps of predicted sea level change over the next 20,000 years: **nature.com/nclimate/journal/v6/n4/fig_tab/nclimate2923_F3.html**<br><br>The British Geographer explains sea level change well: **thebritishgeographer.weebly.com/sea-level-change.html** |

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| settings. | and descriptive statistics (see skills checklist).<br><br>Opportunity to use a range of sources of information to research the impacts of recent and predicted sea level change on coasts.<br><br>Opportunity to construct arguments about the impacts of climate change and come to valid conclusions. | | Questions could include:<br><br>• What is the range of predicted increase in future sea levels?<br><br>• Why is there uncertainty in future predictions?<br><br>• What will the impacts be on coastlines in general?<br><br>• For a specific location what will the impact be on the current landforms that combine to form the landscape?<br><br>• A comparison with the rates of sea level change in the last 10,000 years. | Look at Tower of Karst Peninsular Thailand and emergent coastline in the West Indies<br>**siue.edu/GEOGRAPHY/ONLINE/Gillespie.htm**<br><br>**caribbeanvolcanoes.com/jamaica-geology/**<br><br>National Geographic articles on sea level rise and how this will affect climate change talks_<br>**ocean.nationalgeographic.com/ocean/critical-issues-sea-level-rise/**<br><br>**news.nationalgeographic.com/2015/07/150721-james-hansen-sea-level-rise-climate-change-global-warming-science/**<br><br>Coastal impacts of sea level change from the US perspective: https://19january2017snapshot.epa.gov/climate-impacts/climate-impacts-coastal-areas_.html<br><br>Detailed information on ocean impacts of climate change and sea level rise:<br>**19january2017snapshot.epa.gov/climate-indicators/oceans_.html**<br><br>Summary of causes of sea level change good images to explain change and sea levels through recent geological time: |

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| | | | | **bgs.ac.uk/discoveringGeology/climateChange/general/coastal.html?src=topNav**<br><br>Video animation of sea level change around the British Isles in the last 12,000 years: **reading.ac.uk/archaeology/research/neolithicsteppingstones/_/Sea.html** |
| **Coastal landscape development**<br><br>This content must include study of a variety of landscapes from beyond the UK but may also include UK examples.<br><br>Coastlines of emergence and submergence. Origin and development of associated landforms: raised beaches, marine platforms; rias, fjords, Dalmatian coasts. | Use of key subject specific and technical terminology.<br><br>Develop knowledge and understanding of a range of related landforms that combine to form distinctive coastal landscapes.<br><br>Opportunities to develop skills such as drawing, labeling and annotating diagrams.<br><br>Opportunity to use a range of sources of information to research. | Students will be able to describe the characteristics and analyse the factors and processes in the development of landforms of coastlines of emergence and submergence, including:<br><br>• raised beaches and marine platforms<br><br>• rias, fjords and Dalmatian coasts. | Opportunity to research coastline examples to identify examples of emergent and submergent sections of coast.<br><br>For each submergent and emergent landform listed in the use a range of resources to produce a revision card/sheet (or electronic resource).<br><br>Include:<br><br>• annotated sketch/ diagram showing its characteristics<br><br>• a flow diagram giving a sequenced explanation of formation – explaining processes in their development<br><br>• factors affecting their | Summary of coastline features with good diagrams and images– including emergent and submergent features: **pmfias.com/marine-landforms-erosional-depositional-landforms-coastlines-coastline-emergence-submergence**<br><br>Video clip on raised beaches in Canada: **youtube.com/watch?v=IHW38POC0SY**<br><br>Short video about fjords: **youtube.com/watch?v=U_2DtNLnc0M**<br><br>National Geographic encyclopedia entry on fjords: **nationalgeographic.org/encyclopedia/fjord/** |

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| | | | formation<br>• reference to inputs, processes and outputs of coastal landscapes.<br>• a named illustrative example (not developed case study)<br>• a summary of the timescales involved in the formation of the landforms and subsequent landscapes of which they are a part. | Open University video on forming fjords: **open.edu/openlearn/society/politics-policy-people/geography/forming-fjords**<br><br>Information on raised beaches/marine terraces: **worldlandforms.com/landforms/raised-beach/**<br><br>WizScience video on marine terraces: **youtube.com/watch?v=p_AUkB9EGBo**<br><br>The Geological Society information on the raised beach at Loch Tarbert: **geolsoc.org.uk/GeositesTarbert**<br><br>Alex Jackson has some clear notes on fjords and rias: **geographyas.info/coasts/sea-level-change/** |
| **Weeks 6–7**<br><br>**Coastal management**<br><br>Human intervention in coastal landscapes.<br><br>Traditional approaches to coastal flood and erosion risk: hard and soft engineering. | Use of key subject specific and technical terminology.<br><br>Develop knowledge and understanding of a range of related landforms that combine to form distinctive coastal landscapes. | Students will be able to understand why people manage different coastlines in different ways.<br><br>Students will be able to identify and describe traditional approaches to coastal flood risk and coastal erosion, including hard engineering – sea walls; rock | Share newspaper articles or photographs of issues surrounding the coast that may lead to management. Develop paired/small group discussion on the issues and the needs to manage.<br><br>Possible questions include:<br>• Why should people | Coastal management, and hard and soft engineering approaches are topics that are well resourced in books and online - a sample of resources below:<br><br>Fieldwork Studies Council summary of approaches to coastal management strategies and different approaches available, with reference to fieldwork opportunities: **geography-** |

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| Sustainable approaches to coastal flood risk and coastal erosion management: shoreline management/integrated coastal zone management. | To identify connections and interrelationships between different aspects of geography.<br><br>Opportunities to develop skills such as drawing, labeling and annotating diagrams.<br><br>Opportunity to analyse and present geographical data employing a variety of graphical techniques and descriptive statistics (see skills checklist).<br><br>Opportunity to use a range of sources of information to research the impacts of recent and predicted sea level change on coasts.<br><br>Opportunity to construct arguments about the impacts of climate change and come to valid conclusions. | armour/rip rap; gabions; revetments; groynes; cliff fixing; offshore reefs; barrages<br><br>soft engineering – beach nourishment; dune regeneration; managed retreat; land-use management; 'do nothing'. | manage the coastline?<br><br>• How valuable is the coast?<br><br>• Are all coastal areas equally as valuable?<br><br>• Why might some stretches of coastline be managed differently?<br><br>• What techniques could be used to manage different coastlines?<br><br>Define hard and soft engineering.<br><br>Provide information sheets on a range of hard and soft engineering from textbooks and web resources. Ask pupils to make notes – name, diagram, explanation of how it works, hard or soft engineering?<br><br>Ask pupils to rank and justify choices of management. Repeat the ranking task when involving an example – local or from the initial | **fieldwork.org/a-level/coasts/coastal-management/introduction/**<br><br>Summary article on some coastal management approaches: **se-coastalgroup.org.uk/wp-content/uploads/2012/02/Coastal-Defences.pdf**<br><br>Strategies used along one stretch of coastline at Pevensey Bay in East Sussex: **pevensey-bay.co.uk/index.html**<br><br>Simple video about Pevensey and sea defenses: **youtube.com/watch?v=1QZxa2k0C48**<br><br>Environment Agency information on shoreline management plans: **apps.environment-agency.gov.uk/wiyby/134834.aspx**<br><br>UK government information on how the Environment Agency and local councils are developing shoreline management plans to manage the threat of coastal change: **gov.uk/government/publications/shoreline-management-plans-smps**<br><br>What is a shoreline management plan? **se-coastalgroup.org.uk/what-is-a-smp/** |

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| | | | news stories.<br><br>There is an opportunity to develop understanding and illustrate learning by completing a study of a local coastline. This could involve fieldwork or be classroom based virtual fieldwork.<br><br>Activities could include:<br>• finding a map of the area<br>• mapping the extent of different management strategies employed<br>• annotating the map - describing each strategy and explaining how each strategy protects the coast<br>• suggesting why each strategy has been used in each location over an alternative<br>• the sustainability of the management used<br>• if field data is collected, this could be analysed | 20 min interview with Dr. Burbridge from Newcastle University on integrated coastal zone management (ICZM): **youtube.com/watch?v=g3uD-m6DPcc**<br><br>European Commission information on ICZM: **ec.europa.eu/environment/iczm/index_en.htm**<br><br>Summary of the importance of ICZM for planning in the UK: **planningguidance.communities.gov.uk/blog/guidance/flood-risk-and-coastal-change/why-it-is-important-to-apply-integrated-coastal-zone-management/**<br><br>European Commission presentation on ICZM and maritime spatial planning with useful summary diagrams: **slideshare.net/SUSCOD/2-astrid-schomaker**<br><br>Summary of the origin of the concept and policies of ICZM: **coastalwiki.org/wiki/The_Integrated_approach_to_Coastal_Zone_Management_(ICZM)**<br><br>NOAA shoreline management plans: **shoreline.noaa.gov/** |

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| | | | alongside information on costs and benefits etc.<br><br>Reminder of the definition of 'sustainability' and 'sustainable development'.<br><br>As part of the previous exercises, or following them, comment on the sustainability of each of the approaches studied.<br><br>Opportunity to research sustainable approaches to coastal flood and erosion management in the 21st century, including shoreline management plans. Possible tasks include:<br><br>• research the background to SMPs and CMPs<br><br>• identify the key aims and features of shoreline/ coastal management plans<br><br>• produce a mini-illustrative example of the features of the coastal management most local to them. | Integrated coastal management in Indonesia: **un.org/Depts/los/nippon/unnff_programme_home/fellows_pages/fellows_papers/nurhidayah_0910_indonesia_PPT.pdf**<br><br>OMICS international coastal zone management: **omicsonline.org/conferences-list/coastal-management**<br><br>Mangroves for the future video: **youtube.com/watch?v=4SY7X9zdZ-U**<br><br>Changing seas TV: **youtube.com/watch?v=oaTl7ho-6mY** |

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| | | | Opportunity to conduct research into integrated coastal zone management (ICZM) use research and video clips.<br>• Who are the stakeholders, who should be considered when thinking about coastal management?<br>• How can ICZM be viewed as a cyclical process?<br>Opportunity to research the local ICZM plan for a local coastline.<br>Opportunities to assess all aspects with a full range of exam style questions, including peer assessment – also skills and fieldwork assessment. | |
| **Weeks 8–9**<br>**Case study 1**<br>**Case study/studies** of coastal environment(s) at a local scale to illustrate and analyse fundamental coastal processes, their | Collect, analyse and interpret a range of qualitative and quantitative data from a range of primary and secondary sources – this could include discursive/creative | Students could either study a local coastal landscape through the use of secondary data sources (including online digital mapping, secondary data, local authority websites and text book resources) or engage first hand or complete | An opportunity to create a 'virtual fieldwork investigation' and provide a range of data relating to a local coastal environment for students to investigate and address the themes of the enquiry. | Many of the accompanying textbooks will have illustrative examples of possible coastal fieldwork opportunities and other guidance may be found below.<br>RGS guidance on coastal investigation: |

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| landscape outcomes as set out above and challenges represented in their sustainable management.<br><br>**Case study 2**<br><br>**Case study** of a contrasting coastal landscape beyond the UK to illustrate and analyse how it presents risks and opportunities for human occupation and development and evaluate human responses of resilience, mitigation and adaptation. | material when looking at the experiences of people in place.<br><br>Present, analyse, draw conclusions and evaluate those findings using a range of geographical techniques (see skills checklist).<br><br>Collect, analyse and interpret a range of qualitative and quantitative data from a range of primary and secondary sources – this could include discursive/creative material when looking at the experiences of people in place. | fieldwork to collect primary data, or a combination of both.<br><br>The aims of such work are to:<br>• illustrate how the coastal landscape is distinctive and is the unique combination of the processes and environmental characteristics that created it at a local scale<br>• to investigate and understand how the combination of local coastal processes and landscape features present specific challenges for sustainable management.<br>If students complete a fieldwork investigation, they will be able to follow through a complete geographical investigation and route to enquiry.<br><br>This example is based on an investigation of the Sundarbans region of Bangladesh. | Or, an opportunity for students to conduct a short fieldwork enquiry of a local coastal environment to investigate the main themes of the lesson. Students could write up a mini fieldwork enquiry to act as a case study of a local coastal environment.<br><br>(This could feed into the completion of coursework for the Non-examination assessment element of the specification).<br><br>Opportunity for individual, paired or group research task, using a range of textual, digital or audiovisual resources. Findings could be shared in traditional classroom approaches or shared through a VLE on a blog for example.<br><br>For a more active learning approach students could research from the point of | rgs.org/OurWork/Schools/Fieldwork+and+local+learning/Fieldwork+techniques/coasts.htm<br><br>RGS guidance on fieldwork techniques: rgs.org/OurWork/Schools/Fieldwork+and+local+learning/Fieldwork+techniques/Fieldwork+techniques.htm<br><br>Field studies council guidance on coastal fieldwork: geography-fieldwork.org/a-level/coasts/<br><br>Information is readily available about the Sundarbans, but a selection is given below:<br><br>Overview information of the Sundarbans: sundarbans.com.bd/<br><br>Welcome to the Sundarbans: |

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| | | Students will be able to describe, analyse and evaluate a range of themes relating to how the human population of the Sundarbans interacts with their coastal landscape, including:<br>• an understanding of the coastal processes that combined to create this unique coastal landscape<br>• the challenges and risks of living in the Sundarbans<br>• the opportunities offered by living in the Sundarbans<br>• the human response to the challenges of the Sundarbans, including strategies aimed at resilience, mitigation and adaptation<br>• the potential for possible sustainable development in the future for the people of the Sundarbans. | view of different stakeholders. Feedback could then take the form of a debate/role-play or construction of SWOT analysis in groups etc. | **sundarbans.org/index.html**<br>Encylopedia of Earth: **editors.eol.org/eoearth/wiki/Main_Page**<br>US Aid information on the environment and global climate change: **usaid.gov/bangladesh/environment-and-global-climate-change**<br>Kerawan in Java (Indonesia) also provides a clear range of ideas for this casestudy – resources are readily available online such as this video: **youtube.com/watch?v=cc342SsAYhI** Other resources can be found on ADRA: **adraindonesia.org/en/our-programs/completed-project/bamboo-project** |

## Quantitative and qualitative skills

Students must engage with a range of quantitative and relevant qualitative skills, within the theme landscape systems. These should include observation skills, measurement and geospatial mapping skills and data manipulation and statistical skills applied to field measurements.

## Making connections

Students must consider connections across the themes within the theme of coastal systems and landscapes, connections between this and other themes in the specification and connections with novel geographical themes beyond the specification.

# GET HELP AND SUPPORT

Visit our website for information, guidance, support and resources at **oxfordaqaexams.org.uk**

You can contact the geography team directly;

E: **geography@oxfordaqaexams.org.uk**

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