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Geography Scheme of Learning

Year 10 – Term 6/ Year 11 Term 1 Unit 2: Living with the physical environment/UK Physical Landscapes/Coastal landscapes

Intent – Rationale

Living with the physical environment is about physical processes and systems, how they change, and how people interact with them at a range of scales and in a range of places. This topic introduces the UK's diverse landscapes before considering how physical processes, rock type and structure can form distinctive coastal landforms. This unit also explores how management strategies can be used to protect coastlines from the effects of physical processes and students develop their knowledge of hard and soft engineering. This topic is referred to again in T1 in Y11 when students consider the impact of coastal management strategies whilst carrying our fieldwork in Hunstanton, Norfolk.

Sequencing – what prior learning does this topic build upon?	**Sequencing – what subsequent learning does this topic feed into?**
• KS2 -Locational knowledge – identifying key topographical features (including hills, mountains, coasts and rivers) • Y7 – T6 Landscape processes – coast • Y7 – fieldwork experience from visit to Skegness where physical coastal processes and coastal management were explored.	• Year 12 – Coastal Landscapes and change
What are the links with other subjects in the curriculum?	**What are the links to SMSC, British Values and Careers?**
Science – tides and waves	• SMCS: SP2 M3 – conflict issues regarding coastal management • Careers: GB4 a), b), e), g), h), i); role of planners, engineers in coastal management
What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?	**What are the opportunities for developing mathematical skills?**

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• Wideworld Magazine • Horrible Geography – Cracking coasts FROM THE LIBRARY GCSE *Essential Word* Dictionary-910 *Geographical Enquiries*-910 *Interpreting The Landscape*-910	• Calculating distances using 1:50,000 and 1:25,000 maps • Comparing the costs of coastal management schemes

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Geography Scheme of Learning
Year 10 – Term 6 &Year 11 Term 1

Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?
Know • What are the different landscapes in the UK? • What and where are the UK's river systems? • How waves form? • What happens when waves reach the coast? • What causes cliffs to collapse? (weathering processes) • What are the processes of mass movement? • What is coastal erosion? • What is longshore drift? • What is coastal deposition? • How do headlands, bays, cliffs, wave-cut platforms, caves, arches and stacks form? • How do beaches, sand dunes, spits and bars form? • What are the major landforms of erosion and deposition in North Norfolk? • What coastal landforms can be identified on a 1:50,000 OS map extract? • Why do coasts need to be managed? • What are examples of hard engineering strategies? (groynes, sea wall, rock armour, gabions) • What are examples of soft engineering strategies? (beach management, dune regeneration, dune fencing) • What is managed retreat and why is it considered to be a sustainable management strategy? • What is the Holderness coast and what is its characteristics? • What are the management strategies implemented along the Holderness coast? What are the effects and conflicts? **Apply**

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- Knowledge of rock types in determining the UK's landscapes?
- Knowledge of waves to compare the characteristics of constructive and destructive waves
- Knowledge of sub-aerial processes to describe the effects of weathering and mass movement on a cliffed coastline
- Knowledge of coastal processes to explain sequentially how headlands, cliffs, caves, arches and stacks form
- Knowledge of coastal processes to explain how headlands, bays and wave-cut platforms form
- Knowledge of coastal processes to explain what factors influence coastal landforms?
- Knowledge and understanding of coastal landforms to explain the formation of landforms in North Norfolk
- Knowledge of the term 'sustainable' to explain how soft engineering strategies are sustainable?
- Knowledge of managed retreat to explain why it may not be a feasible option along some parts of the coast?
- Knowledge of the Holderness coast to evaluate coastal management strategies implemented

Extend

- Explain how headlands and bays can affect incoming waves affecting erosive power (wave refraction)
- Justify what evidence a student would look for when carrying out a fieldwork investigation about longshore drift along a stretch of coastline (link to enquiry question for fieldwork for paper 3)
- Predict how depositional landforms may change over time?
- Apply evidence from an OS 1:50,000 map to suggest how a coastline's human use has been affected by its physical geography
- Evaluate hard engineering management strategies
- Justify to what extent coastal management strategies along the Holderness coast could be considered a success?

What subject specific language will be used and developed in this topic?	What opportunities are available for assessing the progress of students?
Landscape An extensive area of land regarded as being visually and physically distinct. Abrasion (or corrasion) The wearing away of cliffs by sediment flung by breaking waves. Arch	Assessment will take 3 main forms: 1. In starters, plenaries and during the lessons there will be regular retrieval practice to reinforce prior knowledge e.g. word searches, bingo, memory recall, definition matches, online quizzes etc. 2. For homeworks -tasks that require students to research new knowledge (e.g. coastal landforms along the Holderness

A wave-eroded passage through a small headland. This begins as a cave formed in the headland, which is gradually widened and deepened until it cuts through.

Attrition

Erosion caused when rocks and boulders transported by waves bump into each other and break up into smaller pieces.

Bar

Where a spit grows across a bay, a bay bar can eventually enclose the bay to create a lagoon. Bars can also form offshore due to the action of breaking waves.

Beach

The zone of deposited material that extends from the low water line to the limit of storm waves. The beach or shore can be divided in the foreshore and the backshore.

Beach nourishment

The addition of new material to a beach artificially, through the dumping of large amounts of sand or shingle.

Beach reprofiling

Changing the profile or shape of the beach. It usually refers to the direct transfer of material from the lower to the upper beach or, occasionally, the transfer of sand down the dune face from crest to toe.

Cave

A large hole in the cliff caused by waves forcing their way into cracks in the cliff face.

Chemical weathering

The decomposition (or rotting) of rock caused by a chemical change within that rock; sea water can cause chemical weathering of cliffs.

Cliff

coast) or apply existing knowledge to exam-style Qs (e.g. Qs from CGP book)

3. Summative assessments – past exam paper Qs in test or exam conditions, either as end-of-unit tests or in Y10 or Y11 formal exams.

A steep high rock face formed by weathering and erosion along the coastline. **Deposition** Occurs when material being transported by the sea is dropped due to the sea losing energy. **Dune regeneration** Action taken to build up dunes and increase vegetation to strengthen the dunes and prevent excessive coastal retreat. This includes the re-planting of marram grass to stabilise the dunes, as well as planting trees and providing boardwalks. **Erosion** The wearing away and removal of material by a moving force, such as a breaking wave. **Gabion** Steel wire mesh filled with boulders used in coastal defences. **Groyne** A wooden barrier built out into the sea to stop the longshore drift of sand and shingle, and so cause the beach to grow. It is used to build beaches to protect against cliff erosion and provide an important tourist amenity. However, by trapping sediment it deprives another area, down-drift, of new beach material. **Hard engineering** The use of concrete and large artificial structures by civil engineers to defend land against natural erosion processes. **Headlands and bays** A rocky coastal promontory made of rock that is resistant to erosion; headlands lie between bays of less resistant rock where the land has been eroded back by the sea.	

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Hydraulic power The process by which breaking waves compress pockets of air in cracks in a cliff. The pressure may cause the crack to widen, breaking off rock. **Longshore drift** The zigzag movement of sediment along a shore caused by waves going up the beach at an oblique angle(wash) and returning at right angles(backwash). This results in the gradual movement of beach materials along the coast. **Managed retreat** Allowing cliff erosion to occur as nature taking its course: erosion in some areas, deposition in others. Benefits include less money spent and the creation of natural environments. It may involve setting back or realigning the shoreline and allowing the sea to flood areas that were previously protected by embankments and seawalls. **Mass movement** The downhill movement of weathered material under the force of gravity. The speed can vary considerably. **Mechanical weathering** Weathering processes that cause physical disintegration or break up of exposed rock without any change in the chemical composition of the rock, for instance freeze thaw. **Rock armour** Large boulders dumped on the beach as part of the coastal defences. **Sand dune** Coastal sand hill above the high tide mark, shaped by wind action, covered with grasses and shrubs. **Sea wall**	

A concrete wall which aims to prevent erosion of the coast by providing a barrier which reflects wave energy. **Sliding** Occurs after periods of heavy rain when loose surface material becomes saturated and the extra weight causes the material to become unstable and move rapidly downhill, sometimes in an almost fluid state. **Slumping** Rapid mass movement which involves a whole segment of the cliff moving down-slope along a saturated shear-plane or line of weakness. **Soft engineering** Managing erosion by working with natural processes to help restore beaches and coastal ecosystems. **Spit** A depositional landform formed when a finger of sediment extends from the shore out to sea, often at a river mouth. It usually has a curved end because of opposing winds and currents. **Stack** An isolated pillar of rock left when the top of an arch has collapsed. Over time further erosion reduces the stack to a smaller, lower stump. **Transportation** The movement of eroded material. **Wave cut platform** A rocky, level shelf at or around sea level representing the base of old, retreated cliffs. **Waves** Ripples in the sea caused by the transfer of energy from the wind blowing over the surface of the sea. The largest waves are formed when	

winds are very strong, blow for lengthy periods and cross large expanses of water. Wave refraction – the bending of waves	

Intent – Concepts

Lesson title	Learning challenge	Higher level challenge	Suggested activities and resources
1. The UK's relief and landscapes	What is meant by 'relief'? What are the different landscapes in the UK? What and where are the UK's river systems?	How do different rock types determine the UK's landscapes?	Starter: look at images of contrasting physical landscapes in the UK and discuss where they could be and what factors influence these landscapes' relief. • Brainstorm prior knowledge of rock types from Y7 and Science lessons/Brainstorm examples of UK rivers • Geology map annotations: Annotate your geology map with notes from the slides handout to show areas of chalk, clay, limestone and granite. • River map annotation using Cambridge textbook pages 110-113. • Extension: Draw a bar chart to show the length of the UK's 5 longest rivers Questions from Oxford pages 90-91 Definition of key terms – gap fill task Homework question: How can different types of rock determine the UK's landscapes (4 marks)
2. Wave types and their characteristics	How do waves form? What happens when	Compare the characteristics of	Starter: here are the definitions, what are the words? Recap vocab from last lesson. Oxford pages 112-113

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	waves reach the coast?	constructive and destructive waves	Cambridge pages 114-117 • Explanation of type of wave formation and what happens when they reach the coast; answer questions from clip: https://timeforgeography.co.uk/videos_list/coasts/types-waves/ • Annotation of wave diagram using notes from Oxford textbook (Q1) then answer questions 2 and 3 in a table form • Plenary: Image of a rockfall – what has happened here and why? (intro to next lesson)
3. Weathering and mass movement	What causes cliffs to collapse? (weathering processes) What are the processes of mass movement?	Describe the effects of weathering and mass movement on a cliffed coastline	Starter: guess the word from clues! • https://timeforgeography.co.uk/videos_list/coasts/subaerial-erosion-processes/ watch clip and make notes of weathering and sub-aerial processes • https://www.youtube.com/watch?app=desktop&v=_XnCTcjNpuc (explanation of freeze-thaw weathering) • Show slide show images to complete explanation of weathering processes and students use Oxford page 94-95 and notes to complete flow chart showing weathering processes. • Annotation of photos to show four types of mass movement (rockfall, landslide, mudflow, rotational slip) using Oxford page 95. • Extension – Answer questions Q1 in Oxford page 95. • Plenary: Video clip of the moving of the Belle Tout lighthouse Belle Tout lighthouse with people around LA Lighthouse with people... Stock Footage Video - Getty Images Homework: Describe the effects of weathering and mass movement on a cliffed coastline (6 marks)
4. Coastal marine processes	What is coastal erosion? What is longshore drift?	Imagine you are doing a fieldwork investigation for	Starter: Key word mix and match definitions from previous lessons (waves, weathering and mass movement)

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	What is coastal deposition?	evidence of longshore drift along a stretch of coastline. What evidence would you look for and why? (link to enquiry question for fieldwork for paper 3)	• Teacher explanation of processes of marine erosion building on prior Y7/Y8 knowledge and clip https://timeforgeography.co.uk/videos_list/coasts/marine-erosion-processes/ • Students draw sketches and complete gap fill task • Teacher explanation of processes of transportation building on prior knowledge with student annotating diagram in explanation of longshore drift. • Students complete an exam answer about longshore drift using :https://timeforgeography.co.uk/videos_list/coasts/Explain-the-process-of-longshore-drift/ • Teacher explanation of deposition building on prior knowledge including wave refraction. Plenary: Oxford page 97 Qd) Imagine you are doing a fieldwork investigation for evidence of longshore drift along a stretch of coastline. What evidence would you look for and why? Homework: CGP exam questions page 33 Coastal Weathering and Erosion
5. Characteristics and formation of coastal erosion landforms.	How do headlands, bays and wave-cut platforms form? How do headlands, caves, arches, stacks and stumps form (sequence of erosion)	What factors influence coastal landforms? How can headlands and bays affect incoming waves affecting erosive power (wave refraction)	Starter: Coastal processes: true or false? • Explanations of how the factors that influence coastal landforms (geological structure and rock type) • Watch clip and answer questions to consolidate understanding: https://timeforgeography.co.uk/videos_list/coasts/Explain-the-process-of-longshore-drift/ • Explanation of how landforms using slides – headlands, bays, cliffs, wave-cut platforms – students annotate diagrams and make notes. • Difference between concordant/discordant coastline • Show clip of Old Harry Rocks in Dorset https://www.bbc.co.uk/bitesize/clips/zj6rkqt

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			• Students to annotate diagram to show sequence of events and processes forming a headland – cave-arch-stack-stump using notes and Oxford textbook page 99. Plenary: match cards – river processes Homework: CGP exam questions Page 34- 35. Coastal landforms caused by erosion
6. Characteristics and formation of coastal depositional landforms.	How do beaches, sand dunes, spits and bars form?	Can I predict how depositional landforms will change over time?	Starter: Image of Blakeney Point and a bar: What? Where? Why? When? Discussion Oxford pages 100-101. Cambridge pages 122 Suggested clips: https://www.bbc.co.uk/bitesize/clips/zhp4d2p and https://www.bbc.co.uk/bitesize/clips/z7h4d2p Students watch clips and make notes from powerpoint slides about bars, spits and beaches Students answer question: how does a spit form? - Key terms are provided for them to include. Sand dunes – students watch clip about Gibraltar Point in Lincolnshire https://timeforgeography.co.uk/videos_list/coasts/formation-sand-dunes/ Video questions and answer Q1: Describe the processes responsible for the formation of the beach and sand dunes (and include a sketch) Plenary: spot the landform Homework: CGP exam questions pages 36-37 – Coastal Transportation and deposition/ Coastal landforms caused by deposition
7. Coastal landforms in North Norfolk	What are the major landforms of erosion and deposition in North Norfolk?	Can I apply knowledge and understanding of coastal landforms to real examples	Independent research task: **To produce an annotated map of the North Norfolk coast which describes and explains its main coastal features of erosion and deposition.** • Students use the resources task sheet, the Oxford textbook (pages 98-101) and a saved powerpoint resource to describe and

		to explain their formation?	explain features of erosion (Hunstanton cliffs and wave-cut platform) and deposition (Blakeney Point spit and salt marsh and sane dunes and Hunstanton beach). They will also be able to access the Digimaps resource for map annotations.
8. Coastal landforms; map skills and photo interpretation	What coastal landforms can be identified on a 1:50,000 OS map extract?	Using evidence from an OS 1:50,000 map, suggest how the area's human use has been affected by its physical geography	Starter: Images of OS map symbols on coasts – quiz! • Oxford pages 104-105. Complete activities. • EXTENSION: Essential mapwork skills pages 45-47. Answer Q3 (Blakeney Point) Plenary: Discussion of how the area's human use has been affected by its physical geography.
9. Managing coasts; hard engineering strategies	Why do coasts need to be managed? What are examples of hard engineering strategies? (groynes, sea wall, rock armour, gabions)	Evaluate hard engineering management strategies	Starter: brainstorm – show image of collapsed cliff and discuss why cliffs need managing. • Show images of hard engineering strategies – groynes, rock armour, sea wall and gabions and discuss advantages/disadvantages. • Students define 'hard engineering' and complete a table describing four engineering strategies with advantages/disadvantages • ***Extension*** – find out about other options for hard engineering. Consider the following: • Revetments, offshore breakwaters, artificial headlands – what is the cost of construction – outline the advantages and disadvantages. • Extension: Maths skills – (Oxford page 107) – calculate comparative costs for different hard engineering strategies

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			• Plenary – what are the advantages and disadvantages of hard engineering at the coast (consolidation of today's lesson.) Is there a more sustainable option?
10. Managing coasts; soft engineering strategies	What are examples of soft engineering strategies? (beach management, dune regeneration, dune fencing)	How sustainable are soft engineering strategies?	Starter: show image of Christmas trees in sand dunes. What? Where? Why? Who? Discussion of how this coastal management strategy is sustainable Define soft engineering. Show images on slides of beach nourishment, dune regeneration and dune fencing. Students feed back on the advantages and disadvantages of these types of coastal management. Complete table with description and advantages/disadvantages of coastal management. (Oxford pages 108-109_ Mapwork Qs – Oxford p36. Complete the Qs and look for evidence of Answer questions 3 and 4 from page 109 in Oxford. Plenary: Debate/vote – which management strategy/ coastal defence is the most effective?
11. Managed retreat (coastal realignment)	What is managed retreat and why is it considered to be a sustainable management strategy?	Explain why a system of managed retreat may not be a feasible option along some stretches of the coastline?	Starter: Show time lapse video of Medmerry Managed retreat near Chichester. https://vimeo.com/78522735 Show digimap of area on powerpoint and ask the question: Why do you think it was decided to breach the sea wall? Define 'Managed Retreat' and complete table showing advantages and disadvantages. Answer questions 2.a)b)c) in Oxford page 111. Pose question – should some coastlines be left with no defences? Should we do nothing? Should people just adapt? (show image with caravans on a cliff) Oxford page 111 Q3. Homework: Examine why a system of managed retreat may not be a feasible option along some parts of the coastline (6 marks)

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12 & 13. Coastal management example: Holderness coasts	Where is the Holderness coast and what are its characteristics? What are the management strategies implemented along this stretch of coastline and what are the effects and conflicts?	To what extent can the coastal management strategies along the Holderness coast be considered a success?	Starter: Image of Sue Earl, the owner of Cowden Farm on the Holderness coast with dairy that is half-fallen off the cliff. Pose thinking questions – what is happening? Why? What is she thinking? Will she get compensation? • Introduce Holderness coast using powerpoint slides and explain the geology (chalk cliffs at Flamborough Head and boulder clay cliffs along the Holderness coast) • Show video https://www.youtube.com/watch?v=J-VzLG15yMQ and pause in places to discuss. Students answer questions on worksheet. Homework: Exam Question: Using an example, evaluate the success of a coastal management scheme along a coast you have studied. (6 marks) Plenary: Coastal management Bingo
13. End of unit assessment	How much have I understood about the Coastal Landscapes topic?	What do I need to consolidate further?	