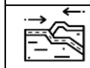
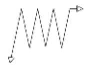
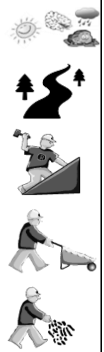
Component	Key idea	Detailed Content	Core Knowledge & Understanding	Keywords	Skills	Icon
Distinctive physical landscapes of the UK	***There are geological variations within the UK.***	Characteristics and distribution of the UK's main rock types: sedimentary (chalk, sandstone) igneous The role of geology and past tectonic processes in the development of upland (igneous and metamorphic rocks) and lowland (sedimentary rocks) landscapes	The three main groups of rocks are: **Sedimentary** – formed in layers called beds, often containing fossils e.g. chalk and sandstone, less resistant to erosion & weathering, large parts of Southern and Central England, Wales and parts of Northern Ireland **Igneous** – formed of crystals from volcanic eruptions e.g. granite & basalt, hard, very resistant to erosion & weathering, mainly north and west of Scotland and Northern Ireland **Metamorphic** – igneous rocks under great heat and pressure e.g. slate and schist, very resistant but splits easily into layers, mainly north and west of Scotland and Northern Ireland The imaginary **Tees-Exe line** divides the UK into uplands (north and west) and lowlands (south and east)	Characteristics Distribution Geology Sedimentary Igneous Metamorphic Tectonic Upland Lowland Glaciers Weathering Erosion Agriculture Forestry Settlement	* Geological maps * Using simple geological cross sections to show the relationship between geology and relief * Locating key physical features (uplands, lowland basins, rivers) on outline UK maps * Recognition of physical and human geography features on 1:25000 and 1:50000 OS maps	
	A number of physical and human processes work together to create distinct UK landscapes	How distinctive upland and lowland landscapes result from the interaction of physical processes (glacial erosion and deposition, weathering and climatological, post-glacial river and slope processes) How distinctive landscapes result from human activity over time	**Tectonic plate movements** millions of years ago (and still continuing today to some extent) caused mountains (huge folds) and faults in the rocks. Convergence of two plates formed upland mountain landscapes in northern Scotland, the Lake District and North Wales **Case Study example, uplands – The Lake District** **Glacial erosions** – formation of arete's, pyramidal peaks, corries and tarns **Weathering** – exposure to weathering leads to rock fragments breaking off exposed rock faces (crags) and falling to base of the cliff, forming scree slopes **Climate** – high precipitation levels over impermeable rocks = lots of streams **Post-glacia**l – flat bottom and steep sides of valleys shows glaciers eroded it forming a U-shaped valley **Case Study example, lowlands – The Weald** **Distinct geological formation** – mix of igneous, metamorphic and sedimentary rocks in layers result in different rates of erosion **Rock resistance** – sedimentary rocks (chalk, sandstone) more easily eroded leaving a flatters 'bulge' of exposed igneous and metamorphic rocks between the North and South Downs **Human activity** **agriculture** – drainage ditches to remove surface water on more-resistant rock types - **arable farming** more suited to fertile sedimentary areas in south and east - **pastoral farming** more suited to thinner soils of north and west uplands **forestry** – naturally covered by deciduous forests but plantations of conifer forests now used for timber			  

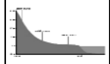
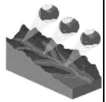
Topic 1 The changing physical landscapes of the UK

Component	Key idea	Detailed Content	Core Knowledge & Understanding	Keywords	Skills	Icon
Coastal landscapes and processes	***A variety of physical processes interact to shape coastal landscapes***	The physical processes at work on the coast: weathering (mechanical, chemical, biological), mass movement (sliding and slumping), erosion (abrasion, hydraulic action, attrition and solution), transport (traction, saltation, suspension, solution and longshore drift) and deposition	**Wave type** – constructive – stronger swash, lower wave height, longer wave length, weaker backwash, deposits material - destructive – stronger backwash, higher wave height, shorter wave length, weaker swash, erodes material **Weathering** – wears away rocks but leaves weathered material in situ **Chemical** – rocks reacting with slightly acidic water **Biological** – plants and animals (e.g. tree roots) cause cracks to widen **Mechanical** – water falls into cracks, freezes, expands making crack wider, thaws and re-freezes in cycle **Mass movement** – downhill movement of material by gravity e.g. sliding and slumping **Erosion** – wearing away of rocks by water and/or wind **Abrasion** – breaking waves throw material against the coast during storms, breaking cliff face **Hydraulic action** - water and air compressed into cracks and joints in cliff face during storms, breaking rock fragments away **Attrition** – rocks and pebbles carried by waves rub together and break into smaller pieces **Solution** – chemical action of seawater dissolves some rocks e.g. limestone **Transportation** – the movement of material by the waves along the coast Longshore drift – direction of prevailing wind at an angle to the beach moves material onto the beach with a strong swash, then gravity and backwash moves material back out to sea at a 90° angle in a zig-zag motion **Traction** – large boulders rolled along the seabed **Saltation** – smaller stones are bounced along the seabed **Suspension** – sand and small particles carried along in the flow **Solution** – some minerals dissolved in seawater **Deposition** – dropping off of material by constructive waves – occurs in sheltered spots, with calm conditions and gentle gradient off shore causing friction **Solution** – some minerals dissolved in seawater **Deposition** – dropping off material by constructive waves – occurs in sheltered spots, with calm conditions and gentle gradient offshore causing friction	Weathering – mechanical, chemical, biological Mass movement – sliding, slumping Erosion- abrasion, hydraulic action, attrition, solution Transportation- traction, saltation, suspension, solution Longshore drift Deposition	* Use of BGS Geology maps (paper or online) to link coastal form to geology * Using UK weather and climate data and calculation of mean rates of erosion using a multi-year data set * Recognition of coastal landforms on 1:25000 and 1:50000 OS maps * Use of 1:25000 and 1:50000 OS maps, and GIS, to investigate the impact of human intervention	    
Coastal landscapes and processes	***A variety of physical processes interact to shape coastal landscapes***	Influence of geological structure (concordant/discordant, joints and faults), rock type (hard/soft rock) and wave action (destructive and constructive waves) on landforms	**Geology** **Concordant coastlines** – coastline with the same rock type facing the sea means erosion rates are similar along the coast **Discordant coastlines** – coastlines with alternating bands of resistant and less-resistant rock types facing the sea means alternating rates of erosion along the coast	Concordant Discordant Swash Backwash		
		How the UK's weather and climate (seasonality, storm frequency and prevailing winds) affect rates of coastal erosion and retreat, and impact on landforms and landscape.	**UK weather and climate** **Seasonality** – more frequent and intense storms in winter leading to greater rates of erosion **Prevailing winds** – from the south-west, brings warm, moist air from the Atlantic (fetch = distance wave has travelled) and frequent rainfall **Effects** – frequent storms can damage coastal landforms like spits, beach sediment can be removed, sand dunes can be destroyed, coastal retreat, increase in rates of erosion, weathering and mass movement	Retreat Seasonality Storm frequency Prevailing winds		

Topic 1 The changing physical landscapes of the UK

Component	Key idea	Detailed Content	Core Knowledge & Understanding	Keywords	Skills	Icon
	Coastal erosion and deposition create distinctive landforms within the coastal landscape	The role of erosional processes in the development of landforms: headlands and bays, caves, arches, cliffs, stacks, wave cut platforms	**Erosional landforms** **Headlands and bays** – formed at discordant coastlines where more resistant rocks are eroded less whilst less resistant rocks are eroded quicker **Caves, arches, stacks and stumps** – formed on headlands, cave formed when waves erode a joint or fault in the rock, erodes through both sides of headland forming an arch, arch collapses through erosion and weathering leaving a stack of disconnected rock, eventually eroded to a stump and then completed eroded away **Wave-cut platform** – cliffs eroded at the bottom by destructive waves leaving an overhang of rocks, cliff retreats and overhang collapses, wav-cut platform of flat rock at base of cliff is exposed at low tide	Headlands and bays Cave, arch, stack, stump Wave-cut platform Undercutting		
Coastal landscapes and processes	***Coastal erosion and deposition create distinctive landforms within the coastal landscape***	The role of depositional processes in the development of landforms: bars, beaches and spits	**Depositional landforms** **Bar -** created when there is a gap in the coastland with water in it. This could be a bay or a natural hollow in the coastland. The process of longshore drift occurs and this carries material across the front of the bay eventually joining up with the other side of the bay and a strip of deposited material blocks off the water in the bay. The area behind the newly formed bar is known as a lagoon **Beaches** – accumulations of sand and shingle by constructive waves in sheltered bays **Spits** – narrow beaches of sand or shingle that are attached to the land at one end, formed where the coastline changes direction (river estuary), longshore drift carries material along the beach but cannot carry it across the estuary so deposits material in long, thin strip of beach, often with recurved end, area behind spit protected from storms results in a salt marsh	Beach Bar Lagoon Spit	* Use of BGS Geology maps (paper or online) to link coastal form to geology * Using UK weather and climate data and calculation of mean rates of erosion using a multi-year data set * Recognition of coastal landforms on 1:25000 and 1:50000 OS maps * Use of 1:25000 and 1:50000 OS maps, and GIS, to investigate the impact of human intervention	
How humans can affect coastal landscapes	***Human activities can lead to changes in coastal landscapes which affect people and the environment***	How human activities (urbanisation, agriculture and industry) have affected landscapes and the effects of coastal recession and flooding on people and the environment	**Human activity** **Urbanisation** – weight of buildings makes cliffs more vulnerable, changes to drainage increase soil saturation, raises interest in protecting coastal landscapes **Agriculture** – increase soil erosion, increases sedimentation, creates wildlife habitats **Industry** – increases air, noise and visual pollution, can destroy habitats, brings wealth and jobs to an area **Coastal recession/coastal retreat -** Wildlife habitats destroyed, cliffs become dangerous for walkers, disruption to communication and transport, decreasing value of properties, loss of businesses and homes, increased deposition further along the coast	Urbanisation Agriculture Industry Coastal recession Flooding Storm surge Hard engineering Sea walls Groynes Rip-rap Soft engineering Beach nourishment Beach replenishment Off-shore reefs Advance the line Managed retreat Hold the line Do nothing		
How humans can affect coastal landscapes	***Human activities can lead to changes in coastal landscapes which affect people and the environment***	The advantages and disadvantages of different coastal defences used on the coastline of the UK (hard engineering, sea walls, groynes and rip rap and soft engineering, beach nourishment and managed retreat) and how they can lead to change in coastal landscapes	**Coastal management - Hard engineering** **Sea Wall** – protects cliffs and buildings but more expensive, £5000-£10,000/m **Groynes** – prevent movement of material from longshore drift, exposes other coastal areas through reduced sedimentation, cheaper £2000/m of timber **Rip rap** – granite boulders reduce wave energy, cheaper £1000-£3000/m **Coastal management – Soft engineering** **Beach replenishment** – sand reduces wave energy and maintains tourism, cheaper £2000/m but must be maintained **Off-shore reefs** – waves break on reefs and lose power, may interfere with fishing and more expensive £500/m			 

Component	Key idea	Detailed Content	Core Knowledge & Understanding	Keywords	Skills	Icon
How humans can affect coastal landscapes	***Distinctive coastal landscapes are the outcome of the interaction between physical and human processes***	The significance of the location of **one named distinctive coastal landscape** within the UK (discordant, concordant, coastline of deposition, coastal retreat) including how it has been formed and the most influential factors in its change	**Located Case Study** **Dorset Coast South coast of England** (also known as the Jurassic Coast through abundance of fossils in sedimentary rock) Discordant coastline of clay, limestone, chalk sandstone which are eroded and weathered to headlands and bays e.g Lulworth Cove and Swanage Bay Warm, dry summers and mild, wet winters leading to weathering through free-thaw and erosion through frequency of prevailing south-westerly winds bringing Atlantic storms Mass movement can result from heavy rainfall leading to collapse of cliffs **Examples** ***Durdle Door*** = arch ***Old Harry's rock*** = stack ***Lulworth Cove*** = Headland and bay ***Chesil Beach*** and/or ***Hurst Castle*** = tombolo/spit ***Barton-On-Sea*** = slumping ***Keyhaven Marshes*** = salt marsh ***Bournemouth Beach*** = coastal management ***Isle of Portland*** = quarrying resulting in rock exposure to weathering ***Coastal footpaths along the Dorset coast*** = footpath erosion through trampling	Sustainable Discordant Concordant Deposition Coastal retreat Shoreline Management Plans		
River landscapes and processes	***A variety of physical processes interact to shape river landscapes***	The physical processes at work in the river landscape: weathering (mechanical, chemical and biological), mass movement (sliding and slumping), erosion (abrasion, hydraulic action, attrition and solution), transport (traction, saltation, suspension and solution) and deposition	**Weathering** – wears away rocks but leaves weathered material in situ **Chemical** – rocks reacting with slightly acidic water **Biological** – plants and animals (e.g. tree roots) cause cracks to widen **Mechanical** – water falls into cracks, freezes, expands making crack wider, thaws and re-freezes in cycle **Mass movement** – downhill movement of material by gravity e.g. sliding and slumping – resulting in river banks being undercut and slumping or sliding into the river channel **Erosion** – wearing away of rocks by water and/or wind **Abrasion** – eroded rocks picked up by river scrape and rub against the river channel **Hydraulic action** - water and air compressed into cracks in river channel, breaking rock fragments away **Attrition** – rocks and pebbles carried by water rub together and break into smaller pieces, smaller and rounder **Solution** – chemical action of water dissolves some rocks e.g. limestone and chalk **Transportation** – the movement of material by the river along the channel **Traction** – large boulders rolled along the riverbed **Saltation** – smaller stones are bounced along the riverbed **Suspension** – sand and small particles carried along in the flow **Solution** – soluble materials dissolve in the water and are carried along **Deposition** – when the river drops the eroded material it is transporting a river loses velocity when: the volume of water falls, the amount of eroded material increases, the depth of the water decreases and/or the river reaches its mouth	Weathering Chemical Biological Mechanical Mass movement Sliding and slumping Erosion Abrasion Hydraulic action Attrition Solution Transportation Traction Saltation Solution Suspension Helicoidal flow Thalweg Deposition	*Use of BGS Geology maps (paper or online) to link river long profiles to geology *Using UK weather and climate data *Recognition of river landforms on 1:25000 and 1:50000 OS maps *Drawing simple storm hydrographs using rainfall and discharge data *Use of 1:25000 and 1:50000 OS maps, and GIS, to investigate the impact of human intervention	

Component	Key idea	Detailed Content	Core Knowledge & Understanding	Keywords	Skills	Icon
River landscapes and processes		How river landscapes contrast between the upper courses, mid courses and lower courses of rivers and why channel shape (width, depth), valley profile, gradient, discharge, velocity and sediment size and shape change along the course of **a named UK river**	**Changes in a rivers long profile The Bradshaw Model** Rivers flow downhill from their source to their mouth **Upper course** - steep gradient, narrow and shallow channel, smaller drainage basin, slower velocity because smaller volume of water (discharge), mainly vertical erosion, V-shaped valleys, interlocking spurs, waterfalls, gorges, rapids, large angular boulders **Middle course** – medium gradient, gently sloping valley sides, wider and deeper channel, larger drainage basin, faster velocity because larger volume of water (discharge, both vertical and lateral erosion, mainly transportation, meanders, ox-bow lakes, some floodplains, smoother rounder pebbles and cobbles **Lower course** – gentle gradient, very wide and deep, almost flat valley, largest drainage basin, fastest velocity until it reaches the estuary, both vertical and lateral erosion, transportation and deposition, meanders, floodplains, levees, estuaries, small, smooth sediment and silt	Volume Discharge Velocity Upper course Middle course Lower course Drainage basin Watershed Confluence Tributary South Mouth		 
	A variety of physical processes interact to shape river landscapes	How river landscapes contrast between the upper courses, mid courses and lower courses of rivers and why channel shape (width, depth), valley profile, gradient, discharge, velocity and sediment size and shape change along the course of **a named UK river**	**Located Case Study** River Tees North-east England – source = Pennines, mouth = Middlesbrough **Geology** more resistant igneous and metamorphic rocks at the source and sedimentary rocks at the mouth **Climate** warm, wet summers and cold, wet winters **Long Profile** - The River Tees **Upper course** **Source** = Cross Fell – narrow, shallow channel, small drainage basin, low discharge and velocity V-shaped valleys - formed as river erodes vertically leaving interlocking spurs Man-made feature = Cow Green Reservoir – built to maintain water levels all year round High Force Waterfall – formed from Whin Sill (resistant igneous rock) laying on top of less resistant sedimentary rock **Middle course** = Yarm – wider and deeper river channel, greater drainage basin leading to increased discharge and velocity **Lower course** = Middlesbrough – widest, deepest channel, largest drainage basin leading to greatest discharge and velocity Teesmouth - mudflats and sandbanks formed from deposition from river and coastal waters from the North Sea – creation of wide, deep mouth used for heavy industry and a port, also used as a nature reserve	V-shaped valley Interlocking spurs Waterfalls Gorge Undercutting Plunge pool Overhang Meander Slip-off slope Point bar Floodplain Levees Silt Alluvium Sediment Bedload Estuary	*Use of BGS Geology maps (paper or online) to link river long profiles to geology *Using UK weather and climate data *Recognition of river landforms on 1:25000 and 1:50000 OS maps *Drawing simple storm hydrographs using rainfall and discharge data *Use of 1:25000 and 1:50000 OS maps, and GIS, to investigate the impact of human intervention	
River landscapes and processes		How the UK's weather (short-term events such as storms and droughts) and climate affect river processes and impact on landforms and landscapes	**Erosion rate** - higher with greater discharge from increased precipitation, more erosion, widening and deepening the river channel **Transport rate** - greater where there is high energy resulting from increased precipitation **Weathering** - freeze-thaw greater in areas of where temperature ranges from just above to just below freezing **Evaporation rates** - higher temperatures lead to higher evaporation rates so less discharge **Increasing frequency of storms** - more intense rainfall **Increasing periods of hot, dry weather** - increases surface run-off due to lack of infiltration **Flood hydrograph** – shows how a river responds to a rainstorm Lag time is time between peak (highest) rainfall (mm) and peak (highest) discharge (m^3/s) - the shorter the lag time, the greater the risk of flooding	Flood hydrograph Storm event Peak rainfall Peak discharge Rising limb Falling limb Lag time Base flow Flood		 

Topic 1 The changing physical landscapes of the UK

Component	Key idea	Detailed Content	Core Knowledge & Understanding	Keywords	Skills	Icon
	Erosion and deposition interacting with geology create distinctive landforms in river landscapes	The role of erosion processes and the influence of geology in the development of landforms: interlocking spurs, waterfalls, gorges and river cliffs	**Waterfall** – formed when resistant (igneous) rock lays on top of less resistant (sedimentary) rock, leading to undercutting of less resistant rock, resulting in waterfall and plunge pool, as overhanging resistant rock collapses without support the waterfall recedes backwards leaving a **gorge** **Interlocking spurs** - formed in the upper course because there is more vertical erosion than lateral erosion, the river cuts down into the valley and if there are areas of hard rock which are harder to erode, the river will bend around it to create a zig-zag valley like the teeth on a zip	Waterfall Gorge Undercutting Plunge pool Interlocking spurs		
		The role of depositional processes in the formation of flood plains, levees and point bars	**Floodplains** – wide, flat area of land either side of a river which experiences flooding when the river tops it banks, carrying a large amount of transported alluvium (fine sediment) and heavier material over the top of the river banks, heaviest material deposited first on river banks creating embankments called **levées**, as flood recedes finer alluvium is deposited on top of levées and further away from the river as it requires less energy to carry finer material, leading to fertile soil used for agriculture	Floodplains Embankments Levees		
River landscapes and processes	***Erosion and deposition interacting with geology create distinctive landforms in river landscapes***	The interaction of deposition and erosion processes in the development of landforms (meanders, oxbow lakes)	**Meanders** – formed by erosion, transportation and deposition, river erodes laterally and starts to form large bends, erosion is greater on the outside of the bend where the current is fastest creating a **river cliff**, deposition takes place on the inside of the bend, where velocity is slowest creating a **point bar** and/or **slip-off slope** **Ox-bow lake** - at times of flood the narrow neck of a meander is widened by erosion, water takes the quickest route, with deposition taking place sealing off the old meander, ox-bow lake left behind when meander is completely cut-off	Meanders Point bar Slip-off slopes River cliff Ox-bow lake		
Human interactions on river landscapes	***Human activities can lead to changes in river landscapes which affect people and the environment***	How human activities and changes in land use (urbanisation, agriculture and industry) have affected river processes that impact on river landscapes; the physical and human causes and effects of river flooding	**Urbanisation** – fewer permeable surfaces, increased surface run-off, increased discharge, greater risk of flooding, more housing built on floodplains increases surface run-off, rivers channelised through culverts underground to make room for urban developments, leads to erosion and deposition not taking place, changing the shape of the river upstream and downstream **Agriculture** – field drains improve farmland but move water into streams more quickly destroying natural wetlands, forest felled for farmland means less interception, increasing surface run-off, abstraction of water for irrigations reduces velocity and discharge resulting in more deposition rather than erosion, ploughing increases amount of sediment in rivers increasing deposition **Industry** – abstraction of water reduces erosion through lower discharge and velocity, pollution from industries can destroy animal and plant habitats and change natural landscapes	Urbanisation Agriculture Industry	*Use of BGS Geology maps (paper or online) to link river long profiles to geology *Using UK weather and climate data *Recognition of river landforms on 1:25000 and 1:50000 OS maps *Drawing simple storm hydrographs using rainfall and	
		Advantages and disadvantages of different defences used on UK rivers (hard engineering– dams, reservoirs and channelisation and soft engineering– flood plain zoning and washlands) and how they can lead to change in river landscapes	**River management hard engineering** **Dams and reservoirs** – store large volumes of water until needed, long-lasting, can be used to generate HEP, very expensive, causes flooding upstream and build up of sediment **Channelisation** – deepening or widening of river channel, allows water flow more quickly away from flood risk areas, unattractive, more water taken downstream increasing risk of flooding, replaces natural meanders and floodplains **River management soft engineering** **Floodplain zoning** – prevents building on areas most likely to flood reducing risk, allows infiltration reducing surface run-off, preserves natural floodplain **Wetlands** – areas deliberately flooded next to rivers to avoid flooding in other areas, creates space for water to go, allows natural processes of erosion and deposition, limits land use, preserves natural floodplains downstream	Dam Reservoir Channelisation Wing dykes Groynes Floodplain zoning Wetlands Afforestation Weirs Culverts		 

Component	Key idea	Detailed Content	Core Knowledge & Understanding	Keywords	Skills	Icon
Human interactions on river landscapes	***Distinctive river landscapes are the outcome of the interaction between physical and human processes***	The significance of the location of **one named distinctive UK river landscape** (upland/lowland), how it has been formed and the most influential factors in its change	**Located Case Study River Eden** **Physical factors** **Location** = ***North west England, Cumbria, Carlisle*** **Geology** = resistant limestone, gritstone and igneous rocks at high altitude surrounding less resistant sandstone rocks at bottom of river valley, very steep sided slopes at the source increases velocity through gravity and reduces infiltration through thin soils **Climate** = south-westerly prevailing winds bring cool, wet summers and mild, wet winters - increasing frequency and intensity of storms in recent years due to climate changes has meant Carlisle and surrounding areas have experienced significant flooding in ***1968, 2005 and 2015*** **Confluence** = ***Carlisle city centre*** - Rivers Eden, Peverill and Caldew in the city of Carlisle **Human factors** **Deforestation** of natural woodland and heathland upstream has resulted in less infiltration and increased surface run-off leading to frequent flood events downstream in ***Carlisle*** and surrounding areas **Agriculture** – drainage for farmland means soil is unstable and compacted by sheep leading sliding and slumping down slopes and increased surface run-off which leads to increased deposition downstream **Management** **10km raised flood defences** along ***River Eden*** and ***River Caldew*** in ***Carlisle*** interrupts natural processes of deposition and formation of meanders **Reservoir** at ***Castle Carrock*** beck increases deposition upstream and increases erosion downstream reducing floodplain build up as a natural protection River Eden has been **channelised i**n many places meaning increased velocity and greater flood risk. Now some areas **restored** to more natural landscape allowing the River Eden to meander, reducing the velocity and flood risk **Dalston** – **afforestatio**n – planting of trees to reduce flooding and erosion and increase interception and absorption of surface run-off