GCSE Physical landscapes in the UK – Coasts Knowledge Organiser

KI : The UK has a range of diverse landscapes

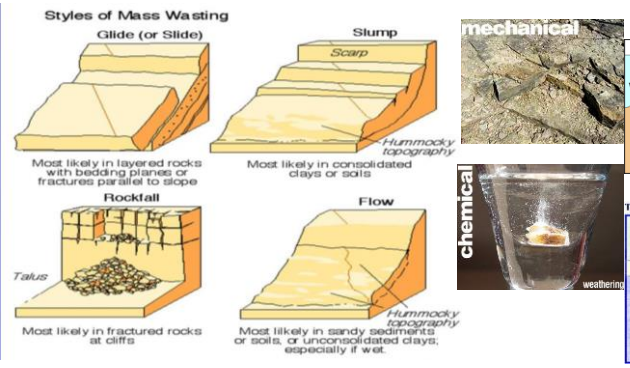
Key terms	Definitions
Chemical weathering	The decomposition of rock by a chemical change within the rock
Deposition	Occurs when material transported by the sea is dropped due to the sea losing energy
Erosion	The wearing away and removal of material by a moving force
Longshore drift	Zig zag movement of sediment along the shore caused by swash and backwash
Mass movement	The downhill movement of weathered material under the force of gravity
Mechanical weathering	Weathering process that causes physical disintegration of rock without any change in the chemical composition of the rock
Sliding	Loose material becomes saturated and flows downhill
Slumping	A whole segment of the cliff moves down slope along a saturated shear-plane or line of weakness
Transportation	The movement of eroded material
Waves	Ripples in the sea caused by the transfer of energy from the wind blowing over the surface of the sea

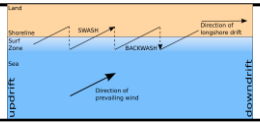
KI : The coast is shaped by a number of physical processes

Constructive waves	Destructive waves
Powerful swash Weaker backwash Long wave length Low wave height Gentle beach	Weak swash Strong backwash Short wave length Higher wave height Steep beach

Types of weathering	
Mechanical weathering	Disintegration / break up of rock e.g. freeze thaw
Chemical weathering	Caused by chemical changes e.g. carbonation, oxidation

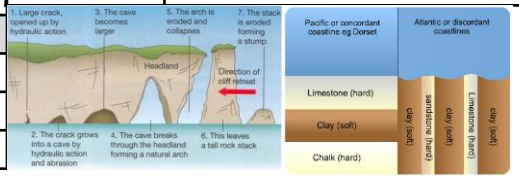
Mass movement	Downward movement of material under the influence of gravity
Sliding	Blocks of rock slide downhill
Slumping	Rotational slip of saturated soil and weak rock
Rock falls	Fragments of rock break away from the cliff face

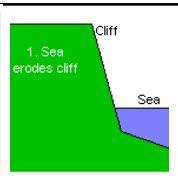


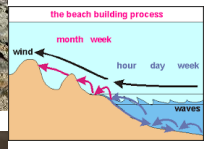
Key terms	Definitions
Abrasion	The wearing away of cliffs by sediment flung by breaking waves
Attrition	Erosion caused when rocks and boulders transported by waves bump into each other and break up into smaller pieces
Hydraulic power	Waves breaking compress air in cracks in a cliff
Transportation : Longshore Drift Swash – the movement of material up the beach Backwash – the movement of material back down the beach	
Deposition – the dropping of material	• Where flow of water slows e.g. sheltered bays • Where there are large flat beaches • Where there are engineered structures e.g. groynes

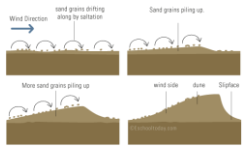
KI : Distinctive coastal landforms are the result of rock type, structure and physical processes

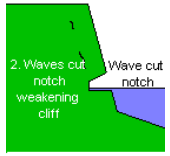
Key terms	Definitions
Arch	A wave eroded passage through a headland
Bar	When a spit grows across a bay to create a lagoon
Beach	The zone of deposited material that extends from the low water line to the limit of storm waves
Cave	Large hole in the cliff caused by waves forcing their way into cracks in the cliff
Cliff	A steep high rock face formed by weathering and erosion along the coastline
Headlands and bays	Headlands are promontories of resistant rock and bays lie in between where these have been eroded back
Sand dunes	Coastal sand hill above the high tide mark
Spit	A finger of sediment extending from the shore caused by deposition
Stack	An isolated pillar of rock left when an arch has collapsed
Wave cut platform	A rocky level shelf representing the base of retreated cliffs

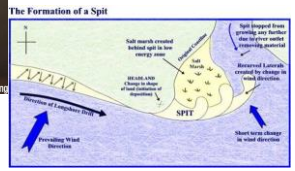


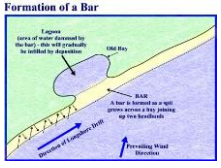


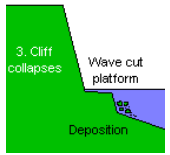












Concordant coastline - Dorset	Discordant Coastline - Devon
Durdle Door (arch) Lulworth Cove Kimmeridge (Wave Cut Platforms) Seacombe (cliffs)	Durlston Head (Headland) Swanage bay Old Harry (stack) Studland sanddunes Sandnaks (beach and spit)

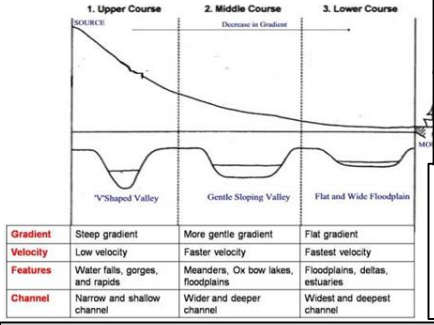
KI : Different management strategies can be used to protect coastlines from the effects of physical processes

Beach nourishment	The addition of new material to a beach artificially. Cheap (£500, 000 per 100 metres), easy to maintain, constant maintenance, sand from seabed destroys organisms
Beach reprofiling	Changing the profile or shape of the beach
Dune regeneration	Action taken to build up dunes and increase vegetation to strengthen the dunes and prevent excessive coastal retreat. Maintains natural environment, cheap, time consuming, areas off limit, limited area £200 – £2000 per 100 metres
Gabion	Steel wire mesh filled with boulders. £50,000 pre 100 metres. Cheap, improves cliff management, unattractive, last 5 – 10 years
Groyne	Wooden barrier built out into the sea to stop longshore drift. £150,000 each, cheap, widen beach, unattractive, causes problems down the coast
Hard engineering	Use of concrete and large artificial structures to defend the coast
Managed retreat	Allowing cliff erosion to occur as nature takes its course. Cheap, natural process, loss of land, relocation of people
Rock armour	Large boulders dumped on the beach as part of the coastal defences. £20,000 per 100 metres, quick to build, expensive to transport rock, rocks might not blend in
Sea wall	A concrete wall to reflect the energy of the sea and prevent erosion. £5000 - £10,000 a metre, effective barrier, promenade on top, expensive, high maintenance
Soft engineering	Managing erosion by working with natural processes

	Example of a coastal management scheme : Medmerry coastal realignment
Reasons for management	• Could not justify cost of new seawall • Flat low lying land • Role of climate change • Shingle ridge only protection • £20, 000 a year spent on beach reprofiiing • If breached 348 properties, treatment plant and main road affected • In 2008 there was £5 million damage
Management strategy	• Let sea flood low lying area • Build new embankment 2 km in • Channel to collect draining water • Rock armour on embankment • 110 metre beach built
Resulting effects and conflicts	• Creates saltmarsh as natural buffer leading to tourism • Protected surrounding farmland and caravan parks • £28 million embankments constructed inland • 1 in 1000 chance of a flood • Cycle route and footpath • Increase in tourism – 300ha nature reserve • Recently flooded area helps fishing and salt marsh beef industry • Expensive for area of sparse population • Local residents and farmers resent land lost

GCSE Physical landscapes in the UK – Rivers Knowledge Organiser

KI : The shape of river valleys changes as rivers flow downstream



	1. Upper Course	2. Middle Course	3. Lower Course
Gradient	Steep gradient	More gentle gradient	Flat gradient
Velocity	Low velocity	Faster velocity	Fastest velocity
Features	Water falls, gorges, and rapids	Meanders, Ox bow lakes, floodplains	Floodplains, deltas, estuaries
Channel	Narrow and shallow channel	Wider and deeper channel	Widest and deepest channel

The long profile is the gradient of the river from source to mouth

The cross profile is the side to side cross section of a river channel or valley

Lateral erosion is sideways erosion of a river on the outside of a meander bend
Vertical erosion is downward erosion of a river bed

Fluvial processes - Processes relating to river erosion, transportation and deposition

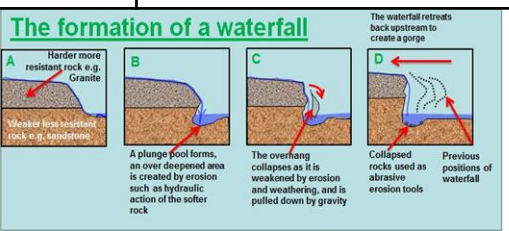
Types of erosion	
Abrasion	Rocks carried by the river wear down the river bed and banks
Attrition	Rocks smash together and break into smaller pieces
Hydraulic Action	Force of the river causes air to be trapped in cracks and weakens the bank

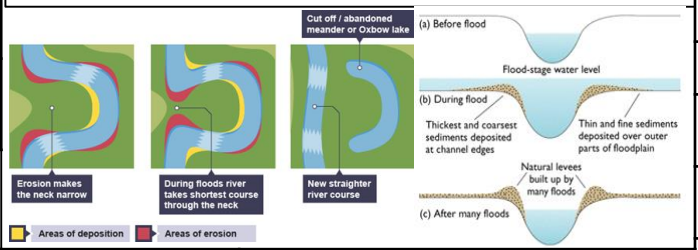
Types of transportation	
Saltation	Particles bouncing down the river bed
Solution	Soluble particles are dissolved into the river
Suspension	Fine solid material held in the water while it is moving
Traction	Rolling of boulders and pebbles along the river bed

KI : Distinctive fluvial landforms result from different physical processes

Upper Course	
Gorge	Narrow steep sided valley formed as waterfall retreats
Interlocking spurs	Series of ridges on alternate sides of the valley the river winds round
Waterfall	Sudden descent of a river over a vertical or step slope in its bed
Middle course	
Meander	Pronounced bend in a river
Ox bow lake	Arc shaped lake cut off from a meander
Lower course	
Estuary	Tidal mouth of the river where it meets the sea
Levees	Embankments of sediment along a river
Floodplain	The flat area forming the valley floor on either side of a river channel

The formation of a waterfall

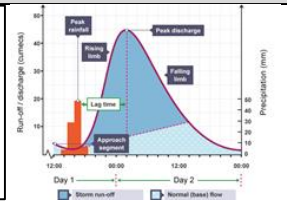


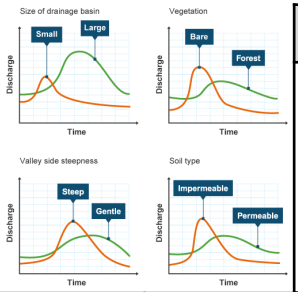


EXAMPLE of river valley in UK	River Severn Landforms
Upper course	Source – Plynlimon Hills Ironbridge gorge rapids Interlocking spurs at Llandiloes
Middle course	Shrewsbury – meander and oxbow lakes
Lower course	Levees near Stourport Floodplain at Tewkesbury Estuary at the Bristol Channel

KI : Different management strategies can be used to protect river landscapes from the effects of flooding

A flood hydrograph is a graph showing the discharge of a river, related to rainfall over a period of time
Rising limb : the increase in river discharge as river flows into the river
Peak discharge : the highest discharge
Lag time : the time difference between peak rainfall and peak discharge
Falling limb : the decrease in river discharge as river returns to normal level





Physical factors affecting the flood risk	Human factors affecting the flood risk
• Precipitation – torrential, continuous, sudden snow melt • Geology – permeable, impermeable • Relief – steep / gentle slopes	• Urbanisation – building towns and cities - impermeable • Deforestation – cutting down trees –Agriculture – ploughing patterns, disappearing fields

Key definitions	
Hard engineering	Building of artificial structures to reduce, disrupt or stop the impact of river processes
Discharge	The quantity of water that passes a given point within a given period of time
Flood	Occurs when river discharge exceeds river channel capacity and water spills over the floodplain
Flood risk	The predicted frequency of floods in an area
Precipitation	Moisture falling from the sky as rain, hail, sleet or snow
Soft engineering	The use of the natural environment surrounding the river to work with the natural processes

	Management strategies – Hard and soft engineering
Dam and reservoir (Hard engineering)	A barrier built across a river to interrupt the flow and create a manmade lake. Regulates flow, provides HEP, boosts tourism, cost, displacement of people, interferes with nature
Embankments (Hard engineering)	Raised banks constructed along the river. Holds more water, habitats for wildlife, cheaper, unnatural, stops access to river
Flood plain zoning (Soft engineering)	Land that is near the river and often floods is not built on. Low cost, green space, traditional meadows protected, less housing areas, difficult to get planning permission
Flood relief channels (Hard engineering)	Artificial channels which are used when the river is close to flood. Decrease flood risk, provide leisure area, displacement of people, creates problems downstream, disturbs habitats
Flood warning (Soft engineering)	Providing reliable advance information about possible flooding. Plan what to do, cheap, ensures safety, only effective if heeded, still floods
Channel straightening (Hard engineering)	Removing meanders to make the river straighter. Speeds up river, improves navigation, increases flood risk downstream, expensive, unnatural
Planting trees (Soft engineering)	Reduces water in river, new habitats, cheap, changes appearance, loss of potential grazing land
River restoration (Soft engineering)	Return river to original course. Natural process, creates new habitats, aesthetically pleasing, loss of agricultural land, expensive

An example of a flood management scheme in the UK	Boscastle, Cornwall
Why the scheme was needed	• 16/8/04 – 3 metre wall of water moved at 60km / hr through the village • 20 businesses and 4 bridges destroyed. Loss of tourism • Some injuries, no deaths • No defences • Steep valley, land upstream deforested, low arched bridge, impermeable rock, unprecedented rainfall
The management strategies	• Old arched bridge replaced with one with higher arch • Embankment strengthened • Channel deepened and widened • Gauge put in • Flood wall built • Car park raised and permeable surface put in • Dead vegetation removed
Social, economic and environmental issues	• Social – disruption to residents, safer, 1 in 75 chance of a flood, spoil character of the village • Economic – less risk of flooding so lower insurance costs, £4 million a year, increased tourism • Environmental – vegetation and river management, habitat improved, engineered to look natural