

YEAR 10 GEOGRAPHY – CYCLE 3 – COASTAL LANDSCAPES

BOX 1: THE CHARACTERISTICS OF WAVES		
	constructive waves	destructive waves
effect on beach	• deposition of beach material	• erosion of beach material
formed by	• wind from storms far away	• wind from storms close by
wave height	• low (under 1 metre)	• high and steep (over 1 metre)
wavelength	• long	• short
frequency	• low (8-10 waves per min)	• high (10-14 waves per min)
energy	• low energy	• high energy
swash	• strong (beach deposited)	• weak
backwash	• weak	• strong (beach eroded)

BOX 2: THE FIVE COASTAL PROCESSES	
weathering	the decomposition or disintegration of rocks in their original place
mass movement	the downhill movement of weathered material due to gravity
erosion	wearing away and removal of material e.g. by a wave
transportation	the movement of eroded material e.g. in waves
deposition	material transported by water is dropped when water loses energy

BOX 3: COASTAL PROCESS 1 → WEATHERING	
1. mechanical weathering	disintegration of rock e.g. by freeze thaw weathering → when water freezes into the cracks in rocks → causes rock to expand and break up
2. chemical weathering	decomposition of rock due to chemicals e.g. the chemicals in sea water or precipitation → causes rock to rot away and crumble

BOX 4: COASTAL PROCESS 2 → MASS MOVEMENT	
1. sliding	after heavy rain → cliff becomes saturated and heavy → extra weight causes material to become unstable → material slides rapidly downhill
2. slumping	cliff segment slumps down along line of weakness e.g. rotational slump
3. rock falls	chunks of rock fall from cliff in sudden movement

BOX 5: COASTAL PROCESS 3 → EROSION	
1. hydraulic power	waves compress air into cracks in cliff → pressure → cracks widen
2. abrasion	sediment thrown at cliff by breaking waves → cliff worn away
3. attrition	rocks transported by waves bump into each other → break up smaller

BOX 6: COASTAL PROCESS 4 → TRANSPORTATION	
1. longshore drift	<ul style="list-style-type: none"> • swash moves material up beach at oblique (diagonal) angle to coastline → due to prevailing wind direction • backwash returns material to sea at a right angle to coastline • gradual zig zag movement of material along coastline

BOX 7: COASTAL PROCESS 5 → DEPOSITION	
Why is sediment deposited in coastal areas?	<ul style="list-style-type: none"> • deposition is when sediment carried by waves is dropped • happens when water slows and loses energy e.g. sheltered areas (near spits/bars) or where strong swash (constructive waves)



BOX 8: GEOLOGICAL STRUCTURE AND ROCK TYPE	
discordant coast	bands of rock are perpendicular to coastline
concordant coast	bands of rock are parallel to coastline
resistant rocks	hard rocks → erode less easily e.g. granite, chalk, limestone
less resistant rocks	soft rocks → erode more easily e.g. clay, sandstone

BOX 9: LANDFORMS RESULTING FROM EROSION	
1. headlands and bays	discordant coast → less resistant rocks erode easily forming a bay → more resistant rocks erode slowly forming headlands → bays sheltered by headlands → deposition from constructive waves builds beach in bay
2. cliffs and wave cut platforms	waves break at cliff base → erodes wave-cut notch → cliff unsupported → cliff collapses → cliff retreats → leaves a smooth wave cut platform
3. caves, arches and stacks	wave refraction focuses wave energy onto headlands → increases erosional processes → creates → crack - notch - cave - arch - stack - stump

BOX 10: LANDFORMS RESULTING FROM DEPOSITION	
1. beaches	Constructive waves = sandy beaches . Destructive waves = pebble beaches .
2. sand dunes	sand at back of beach dries out and is blown backwards by wind → sand builds up against objects → marram grass stabilises embryo dune
3. spits and bars	longshore drift moves sand along coast → sand deposited past the edge of coast forming spit or bar → hook shape on end → salt marsh behind

BOX 11: MANAGEMENT STRATEGY 1 → HARD ENGINEERING → ARTIFICIAL		
	benefits ☺ → positives	costs ☹ → negatives
sea walls	very effective at reducing erosion	very expensive, unattractive
rock armour	can be used for fishing	can be dangerous to walk on
gabions	plants grow and disguise the cages	can rust and break apart in storms
groynes	reduce longshore drift	increase erosion down coastline

BOX 12: MANAGEMENT STRATEGY 2 → SOFT ENGINEERING → NATURAL		
	benefits ☺ → positives	costs ☹ → negatives
beach nourishment and reprofiling	builds up sand on beach which protects against erosion	constant maintenance required
dune regeneration	attractive, tourism, biodiversity	easily damaged by storms

BOX 13: MANAGEMENT STRATEGY 3 → MANAGED RETREAT → ALLOWS FLOOD/EROSION		
	benefits ☺ → positives	costs ☹ → negatives
coastal realignment	creates saltmarsh ecosystem	farmland flooded by the sea

BOX 14: CASE STUDY → COASTAL MANAGEMENT SCHEME IN THE UK → LYME REGIS	
scheme/strategy	Lyme Regis Environmental Improvement Scheme → cost £40 million → sea walls, rock armour, rock groyne, beach nourishment /reprofiling
needed because	homes threatened by eroding cliffs, landslips, beach mostly eroded away
effects of strategy	new sandy beach has increased tourism, homes and businesses safer
conflicts of strategy	more traffic from tourists , some people believe scheme is unattractive

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