Coasts Knowledge Organiser

Constructive and Destructive Waves:

	Constructive Waves	Destructive Waves
Height	Low in height	High in height
Wavelength	Long wavelength - up to 100m	Short wavelength
Frequency	Low frequency - 6-8 per minute	High frequency - 10-14 per minute
Stronger Wave?	Stronger swash than backwash	Stronger backwash than backwash
Beach	Sand - sloping beach	Shingle - steep beach

Transportation

A natural process by which eroded material is carried/ transported.

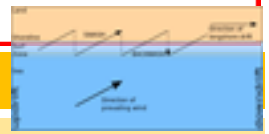
Solution	**Minerals dissolve in water and are carried along.**
Suspension	**Sediment is carried along in the flow of the water.**
Saltation	**Pebbles that bounce along the sea/river bed.**
Traction	**Boulders that roll along a river/sea bed by the force of the flowing water.**

Coastal Processes - Erosion

The break down of rocks – smooth, round and sorted.

Attrition	**Rocks that bash together to become smooth/smaller.**
Solution	**A chemical reaction that dissolved rocks.**
Abrasion	**Rocks hurled at the base of a cliff to break pieces apart.**
Hydraulic Action	**Water enters cracks in the cliff, air compresses, causing the crack to expand.**

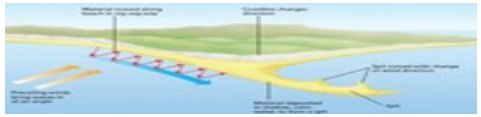
Longshore Drift:
Waves approach the shore at an angle so material is pushed up the beach by the swash in the same direction as the waves. The water runs back down the beach and the backwash drags material down the steepest gradient at right angles to the beach. Over a period of time, sediment moves in a zig-zag pattern down the coast - the material becomes smaller and more rounded.



Deposition

When the sea or river loses energy, it drops the sand, rock particles and pebbles it has been carrying. This is called deposition.

Formation of Coastal Spits - Deposition



Example: Spurn Head, Holderness Coast

1)Swash moves up the beach at the angle of the prevailing wind. 2)Backwash moves down the beach at 90° to coastline, due to gravity. 3)Zigzag movement (Longshore Drift) transports material along beach. 4)Deposition causes beach to extend, until reaching a river estuary. 5)Change in prevailing wind direction forms a hook. 6)Sheltered area behind spit encourages deposition, salt marsh forms.

Formation of Coastal Stack

Example: Old Harry Rocks, Dorset

1)Hydraulic action widens cracks in the cliff face over time. 2) Abrasion forms a wave cut notch between HT and LT. 3)Further abrasion widens the wave cut notch to from a cave. 4)Caves from both sides of the headland break through to form an arch. 5)Weather above/erosion below –arch collapses leaving stack. 6)Further weathering and erosion eaves a stump.

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Coastal Defences

Hard Engineering Defences		
Groynes	**Wood barriers prevent longshore drift, so the beach can build up.**	**Beach still accessible. No deposition further down coast = erodes faster.**
Sea Walls	**Concrete walls break up the energy of the wave . Has a lip to stop waves going over.**	**Long life span Protects from flooding Curved shape encourages erosion of beach deposits.**
Gabions or Rip Rap	**Cages of rocks/boulders absorb the waves energy, protection the cliff behind.**	**Cheap Local material can be used to look less strange. Will need replacing.**
Soft Engineering Defences		
Beach Nourishment	**Beaches built up with sand, so waves have to travel further before eroding cliffs.**	**Cheap and creates beach for tourists. Storms = need replacing. Offshore dredging damages seabed.**
Managed Retreat	**Low value areas of the coast are left to flood and erode naturally.**	**Reduce flood risk Creates wildlife habitats. Compensation for land.**

Case Study: The Holderness Coast

Location and Background

Located along the North-East coast in the county of Yorkshire. The coast extends 50km from Flamborough Head to Spurn Head.

Geomorphic Processes

-Flamborough Head is made from more resistant chalk. Features: wave-cut platforms, caves and stacks

-South from Flamborough Head the less resistant boulder clay is dominate. This coasts erodes 1.8m per year and is the fastest in Europe. Cliff slumping can be evident.

-Further south, Spurn Head is a coastal spit created by continual deposition from LSD that extents out to sea.

We can use the power of the waves to create renewable energy

Benefits of using wave energy

•Wave energy produces no pollution. •Making wave machines parts creates jobs •Britain could make so much electricity from waves that it could sell it to

Negatives of using wave energy

•We cant store the electricity • Harm habitats and sea creatures •The equipment is very expensive •Rough seas in the winter make the machinery difficult to fix .