

YEAR 9 GEOGRAPHY – COASTS

1 KEY VOCABULARY

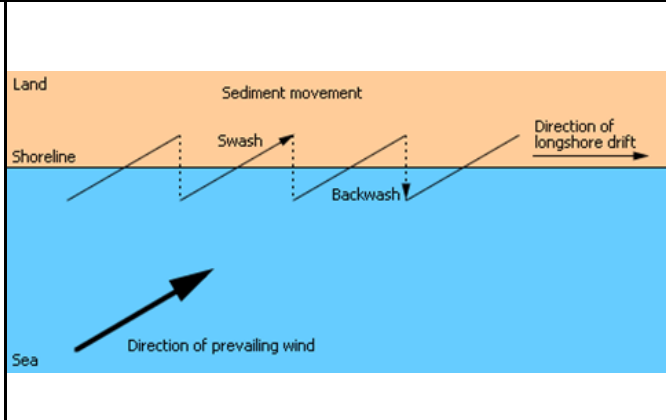
Coastal zone	The coastal zone is the place where the land meets the sea.
Erosion	Waves can erode the coastline in a similar way to the water in rivers. This usually occurs when the sea takes lots of energy from the power of <u>destructive</u> waves.
Transportation	The movement of eroded material up and down, and along the coast.
Deposition	When the sea loses energy, it drops the sand, rock particles and pebbles that it has been carrying, depositing them
Hydraulic action	Air may become trapped in joints and cracks on a cliff face. When a wave breaks, the trapped air is compressed which weakens the cliff and causes erosion.
Abrasion	Bits of rock and sand in waves grind down cliff surfaces like sandpaper.
Attrition	Waves smash rocks and pebbles on the shore into each other, and they break and become smoother.
Solution	Acids contained in sea water will dissolve some types of rock such as chalk or limestone.

2 TYPE OF WEATHERING

BIOLOGICAL —When plants wear away rocks because the roots get into the cracks. Or animals burrow into the cracks.	CHEMICAL —Carbon dioxide from the air dissolves into the rainwater making it acidic. Limestone and chalk are easily eroded.	PHYSICAL —Freeze thaw weathering is when water gets into a crack and freezes. As it freezes it expands and breaks the rock apart.
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3 LONGSHORE DRIFT

A process of transportation, longshore drift is where sediment moves along a beach, Waves approach the coast at an angle. Swash carries sediment up the beach at an angle. Backwash carries sediment down the beach with gravity – at right angles to the beach. This creates a zig-zag movement of sediment along the beach.



4 FACTORS THAT INFLUENCE RATES OF EROSION

Rock Type	chalks and limestone can form steep cliffs , whereas clays and softer rock form large bays .
Rock Structure	a discordant coastline, where rocks are at an angle to the edge of the coastline, will erode at different rates.
Shape of the coastline	headlands of a coastline are exposed to the full force of destructive waves. Bays are more sheltered from the wave energy because of wave refraction , so erosion is slower.
Type of wave	The amount of energy a wave has helps determine the rate of erosion.

5 WAVE TYPES

There are two types of waves

constructive : low energy waves that often deposit sediment

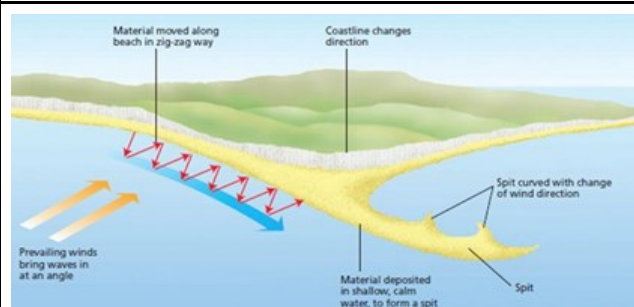
Destructive : high energy waves that often erode sediment

Wave energy is created by the wind. The length of time it blows, how strong it is and the distance it blows across which is called the fetch

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5 FORMATION OF A SPIT EXPLAINED

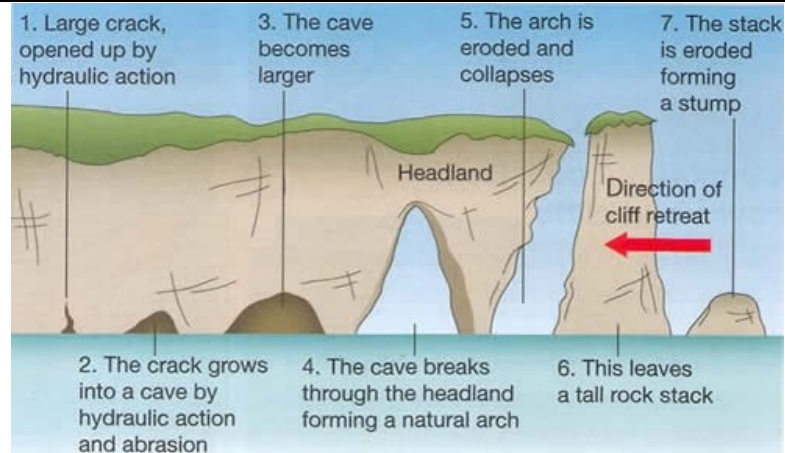
1. Longshore drift moves material along the coastline.
2. A spit forms when the material is deposited.
3. Over time, the spit grows and develops a hook if wind direction changes further out.
4. Waves cannot get past a spit, which creates a sheltered area where silt is deposited and mud flats or salt marshes form.



7 KEY VOCABULARY

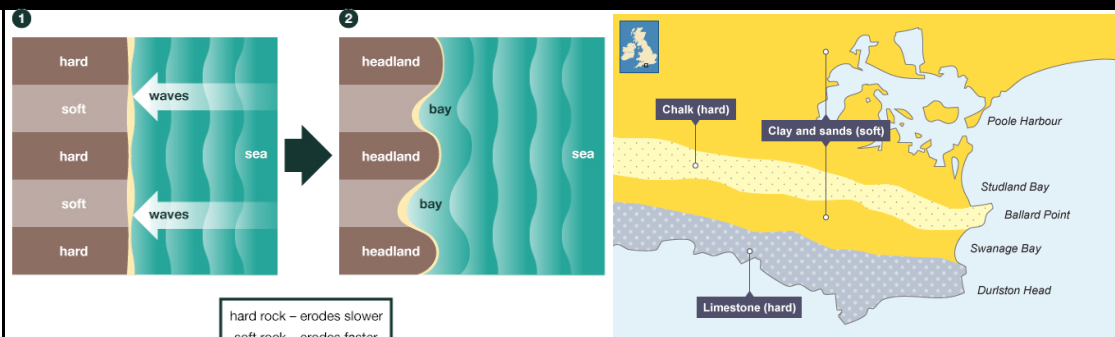
long-shore drift	The movement of material along a coastline due to the angled approach of waves.
spit	A stretch of beach at one end of a coastline caused by waves depositing material.
Salt marsh	an area of coastal grassland that is regularly flooded by sea-water, often found behind coastal spits.
Geology	Type of rock e.g. chalk, limestone, granite

8 EROSION OF A HEADLAND



- Headlands are usually made of more resistant rocks that have weaknesses like cracks.
- Waves crash into the headlands due to wave refraction and enlarge the cracks mainly by hydraulic action and abrasion.
- Repeated erosion and enlargement of the cracks causes a cave to form.
- Continued erosion deepens the cave until it breaks through the headland forming an arch.
- Erosion continues to wear away the base of the arch and weathering weakens the roof.
- The arch eventually collapses to form a stack – an isolated rock that separate from the headland

6 BAYS AND HEADLANDS



Headlands are formed when the sea attacks a section of coast with alternating geology, bands of hard and soft rock. The bands of soft rock, e.g. sand and clay, erode more quickly than those of more resistant rock, e.g. chalk and limestone. This leaves a section of land jutting out into the sea called a headland. The areas where the soft rock has eroded away, next to the headland, are called bays.

9 OTHER DEPOSITIONAL FEATURES

Beaches - formed by constructive waves. Sand beaches are flat and wide, shingle are steep and narrow.

Sand dunes—sand is moved by longshore drift, obstacles cause wind speed to drop so sand is deposited. Plants and grass grow (colonise). The embryo dune becomes a mature dune over time.

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HARD AND SOFT ENGINEERING STRATEGIES TO MANAGE THE COASTLINE

Strategy/ HARD OR SOFT	Description	Advantages	Disadvantages
Beach nourishment SOFT	Material dredged from the sea bed is used to build up the beach. Sand is pumped into the existing beach to make it more firm against the waves.	The new sand blends with the previous land and looks natural. It improves the aesthetic beauty of the place and attracts more tourism.	The sand needs to be constantly replaced with new and better grain of sand. The sand has to be transported from one place to another
Managed retreat SOFT	It allows the exposure of land near to coastal area to flooding so that the waves pressure is distributed and it does not erode a specific area.	This is the cheapest option as compared to other coastal protection strategies. The formation of salt marshes allows wildlife to make this place their habitat and also work as natural defence against floods and erosion.	A large area is covered by the sea which can't be used for any other purpose. The owners of the land need to be compensated for the cost of land occupied for flooding.
Sea Walls HARD	Curved concrete walls built at the back of the beach send the wave energy back to the sea. These made of concrete at the base of the cliff to prevent erosion	Effectively protect the foot of the cliff. Promenade can be made on these so that public can walk along the sea-front.	These are very expensive. Powerful waves can still break them and erode them away, so continuous maintenance are required.
Rock Armour HARD	Large boulders are placed at the base of cliffs. Wave energy is absorbed that helps in reduction of erosion and preventing cliff collapse.	These are also used for fishing. It is a cheaper option than a sea wall and maintenance is also easy.	Transportation of big rocks is difficult and expensive. Rocks which do not belong to local geological structure looks a bit odd as it does not match the structures in the surrounding area.
Gabions HARD	Boulders and rubbles are wired together into large blocks to stop them from moving. The blocks absorb the wave energy.	These are cheap and absorb wave energy effectively.	These are relatively less sturdy than other options. These also look odd as the mesh structures give an unnatural look to the surroundings.
Groynes HARD	These are wooden fences that prevent longshore drift. Sands and pebbles collect between these fences and build a beach	Increase in tourism due to development of beach. Longshore drift cannot take away the sand and pebbles available on the beach.	These do not give an aesthetic look to the beach. They do not allow the sediments to spread further on the beach leading to erosion on a different place