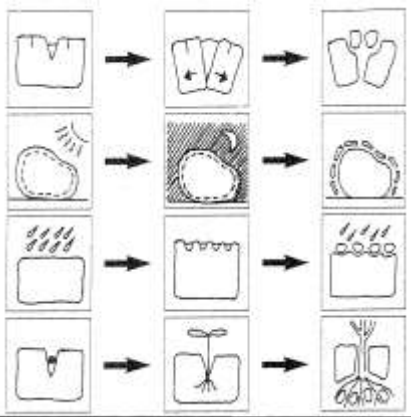


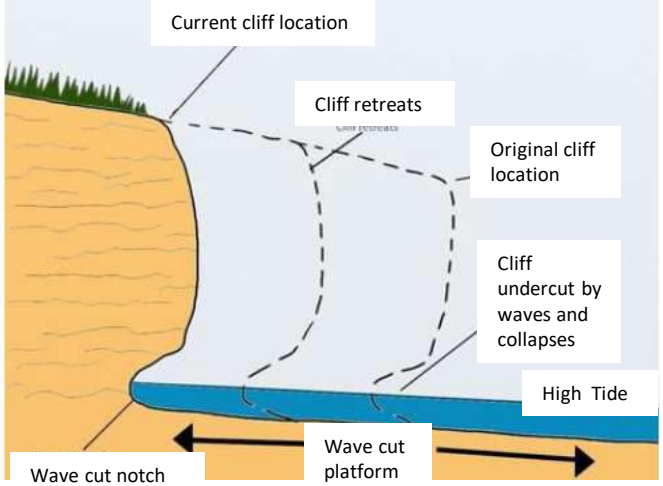
Weathering

Freeze Thaw is because as water freezes it expands. This creates powerful forces that can enlarge the cracks.

Onion Skin weathering is because the sun heats a rock and the outer layer expands. At night the rock cools and contracts. Eventually small pieces of the rock peel off.

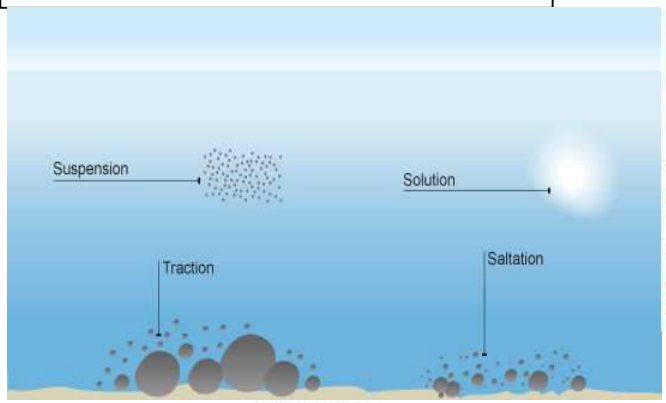
Chemical weathering is because the small amount of acid in the rain attacks the rock. The rock dissolves and rots away.

Biological weathering is because a seed falls into a crack in a rock. The seed grows with the help of the sun and rain. The roots grow bigger and the rock breaks up.

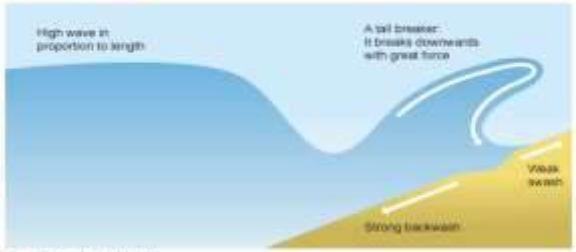


Traction-boulders are rolled along sea floor
Saltation -pebbles bounce along sea floor
Suspension –sand and silt carried by the sea water
Solution- material is dissolved and carried by the water

Deposition is when the energy of the sea slows down and the load (Sand, pebbles or boulders) is dropped.



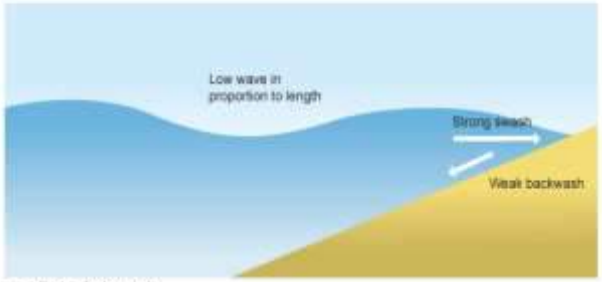
Destructive waves



The effects of a high wave

- Destructive waves are created in storm conditions.
- They are created from big, strong waves when the wind is powerful and has been blowing for a long time.
- They occur when wave energy is high and the wave has travelled over a long fetch.
- They tend to erode the coast.
- They have a stronger backwash than swash.
- They have a short wave length and are high and steep.

Constructive waves

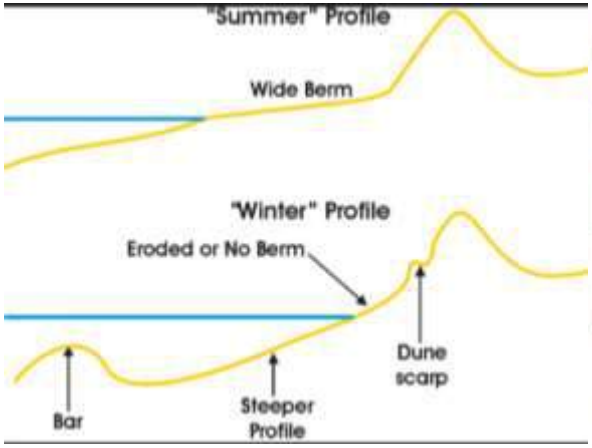


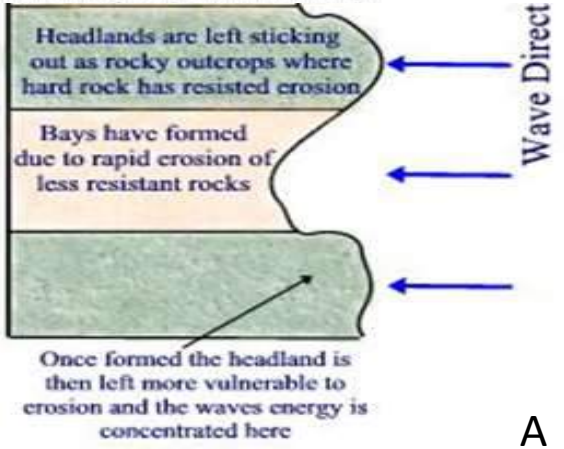
The effects of a low wave

- They are created in calm weather and are less powerful than destructive waves.
- They break on the shore and deposit material, building up beaches.
- They have a swash that is stronger than the backwash.
- They have a long wavelength, and are low in height.

Processes of Erosion

Hydraulic Action	This is when waves crash against rock and compress air in cracks. This puts pressure on the rocks. Repeated compression widens the crack and makes bits of rock fall off.	
Abrasion	The waves throw particles of sand, silt and pebbles against the rocks. The material rubs against the coast eroding it. The rocks act as cutting tools and cause undercutting.	
Solution erosion	Weak carbonic acid in seawater dissolves rock like chalk and limestone.	Calcium carbonate; Limestone rock
Attrition	This is when material carried by the waves collides into each other. Each bump chips pieces off the material reducing them in size. The rough sharp edged material becomes more rounded and smoother.	





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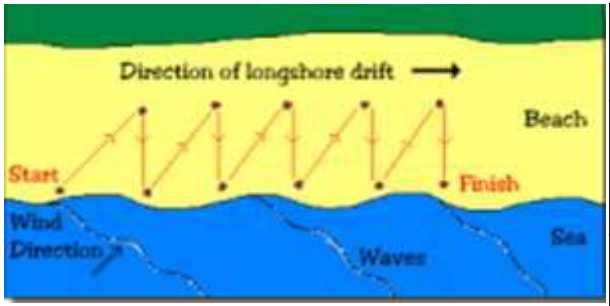
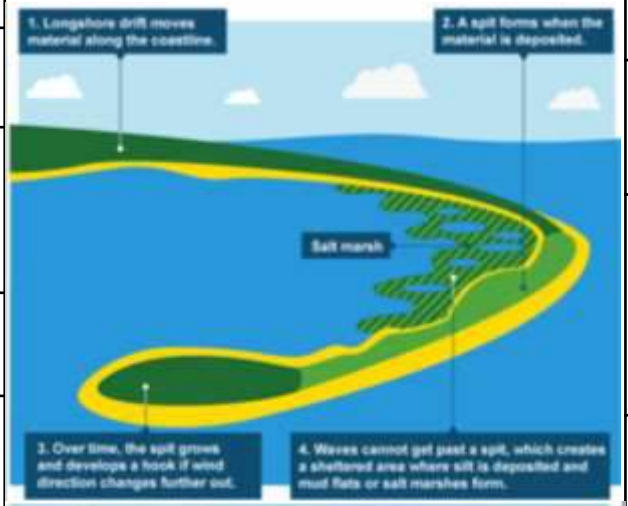
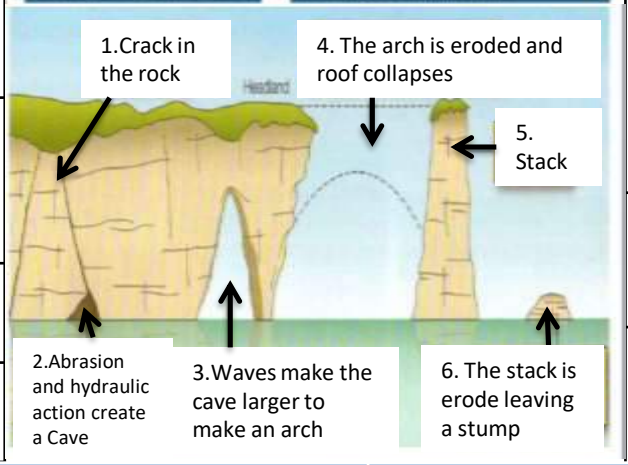
Conflicting views on coastal management. View 1.DEFRA	**Happisburgh, Norfolk £2m for 18 rather poor houses.**
View 2. Phyllis Tubby, a retired nurse aged 85,	She feels she has been deserted. Her pristine bungalow, a few yards from the cliff edge, is considered worthless. No one will buy it and it is uninsurable.
How do people use the coast?	Tourism, fishing, offshore wind power, shipping and recreation
Case study of coastal erosion Mappleton, Causes	Longshore drift and the geology of the Holderness coast (Boulder clay).
Impacts on people	Increased erosion further down the coast
Responses	2 million pounds spent to protect Mappleton from coastal erosion. Two Groynes and a section of rock armour built to protect the B road and village.
Case study of coastal erosion _Happisburgh, Causes	18 houses at risk of falling into the sea.
Impacts on people	Houses being destroyed by longshore drift and coastal erosion.
Responses	Refused to spend money to protect it would cost £2m protect 18 rather poor houses.







Method of Protection	How does it work	Advantages	Disadvantages
Sea Wall- Concrete cured wall	Protects the coast and reflects the energy	Lasts 30 to 40 years	Very expensive £6000 to £10000 per metre
Groynes- Barriers built at right angles to the beach	Builds up a beach by trapping sand	Traps sand from long shore drift and builds up the beach	Deprives another area, down-drift, of new beach material
Rock armour- Large boulders	Large boulders that absorb the power of the waves	Cheap £1000 per metre	Need to replaced after large storms
Beach nourishment	Sand is added to build up and widen the beach	Sand is added to the beach and longshore drift will carry it along the coast building up beaches	Expensive needs to e done every year £100 per metre per year
Sand Dune stabilisation	Marram grass is planted to stabilise sand dunes	The sand dunes absorb the large waves during storms	Needs a large area for the sand dunes and they can be damaged by people walking on them.
Hold the line	Keep the coastline at its present position.	The coast line is protected.	The engineering solutions cost money.
Retreat the line	This is when areas of coast are allowed to erode.	Low cost and allows natural balance to be maintained	Farmers lose land and buildings with no compensation

How have humans modified the coast for economic benefits	**Mappleton 2 groynes to protect B road at the cost of 2 million pounds. Lead to erosion further down the coasts**	**Easington Gas terminal built back from the coast because they thought the gas would run out earlier. Built a kilometre long revetment**	**Spurn Point- built a pilot station and Life boat station on the end. Tried to fix Spurn point in place. Damaged by the 2013 Storm Surge**

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