

# Knowledge organiser:

## What happens where the land meets the sea?

### KEY VOCABULARY

**Abrasion** – A process where sediment in the waves is thrown at the coast and wears away at the surface making it smooth. The ‘sandpaper effect’.

**Hard Engineering** – the construction of structures to prevent erosion and flooding of the land.

**Attrition** – The process of rocks in the waves crashing into each other and becoming smoother and more rounded.

**Hydraulic Action** – Waves force air and water into cracks in the rock. This causes fragments of rock to break off.

**Managed retreat** – a coastal management strategy that allows the coastline to move further inland with any human development abandoned or relocated away from the risk.

**Longshore drift** – The movement of sediment along a coastline via the waves.

**Constructive waves** - Low energy waves that deposit material in areas as the swash is stronger than the backwash.

**Solution** – The chemical composition of sea water can react with minerals in the rock causing them to dissolve, breaking up the rock overtime.

**Destructive waves** - High energy waves that erode coastlines as the backwash is stronger than the swash.

**Soft Engineering** - strategies that use the natural environment to help protect land from erosion and flooding.

### Why are coasts

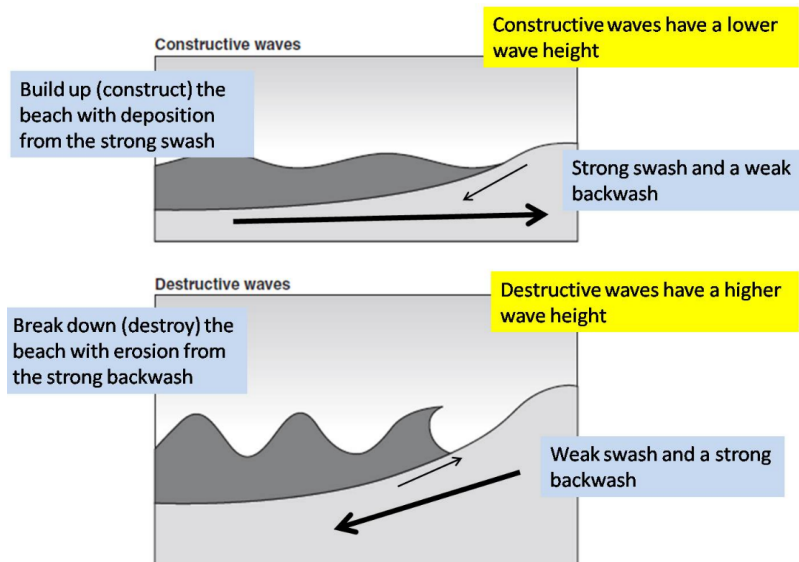
### important to humans

- Ports
- Energy production
- Defence
- Farming
- Settlements



### What is the difference between tides and waves?

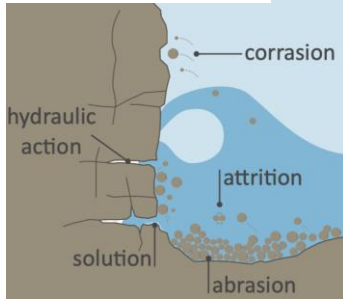
- Tides are the rise and fall of water levels in the ocean due to gravitational pulls.
- Waves are a series of crests and troughs in the water that are formed due to friction from the wind. The stronger the wind is and the longer it has blown for, the larger the wave.



# Coastal Processes

Coasts never stop shaping the land. The waves erode material from the coastline in one place then transport it along the coast where it is deposited somewhere else. This creates distinctive landforms

## Coastal Erosion

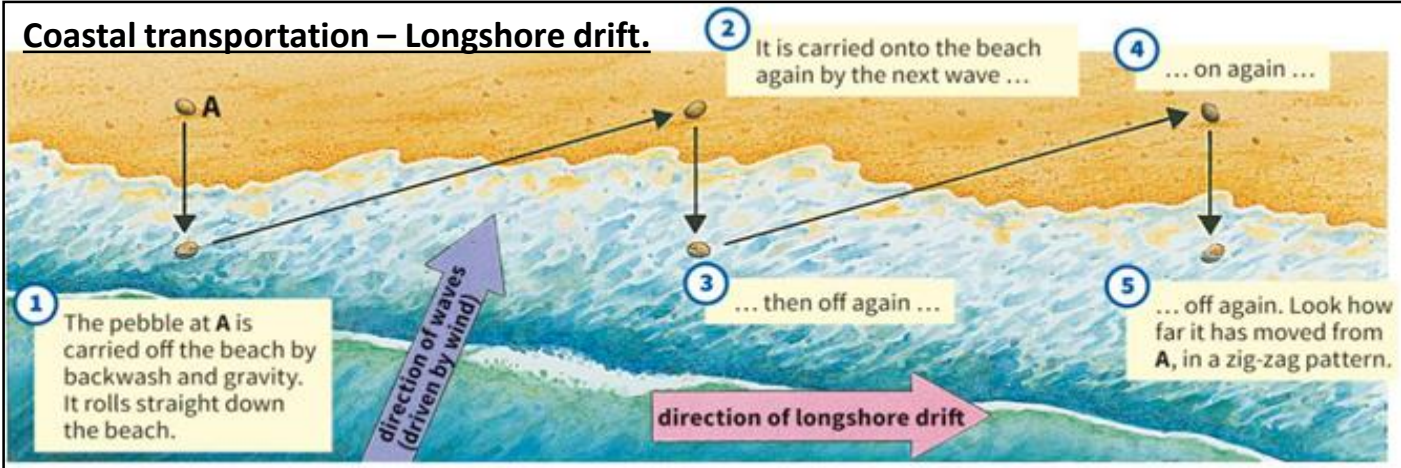


## Coastal Erosion

This is where the waves break up the coastline.



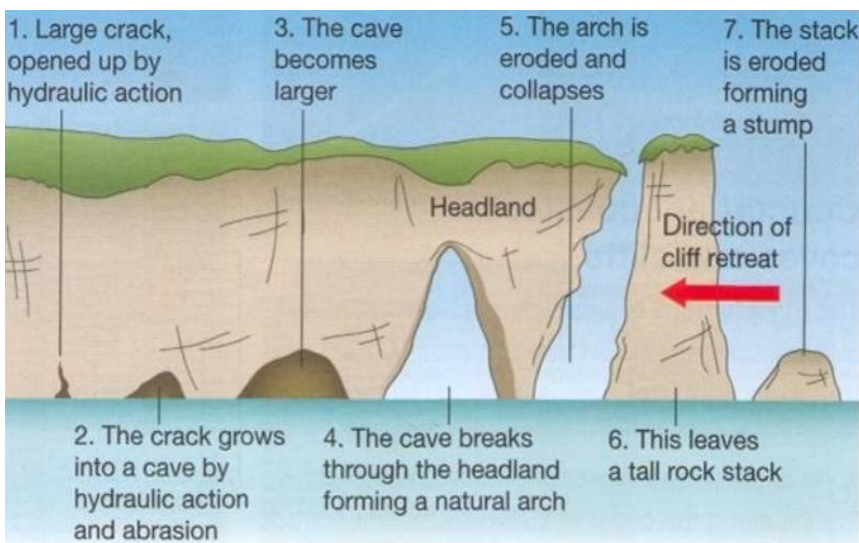
## Coastal transportation – Longshore drift.



## Coastal deposition

When the sea loses energy, it drops the sediment it has been carrying. This is called deposition. Deposition happens when the swash is stronger than the backwash and is associated with constructive waves.

## Erosional landforms – caves, arches and stacks



## Depositional landforms - Beaches

Made from eroded material that has been transported from elsewhere and then deposited.

Found in areas where:

- There are normally constructive waves.
- The water is shallow,
- The coast is sheltered eg a bay.

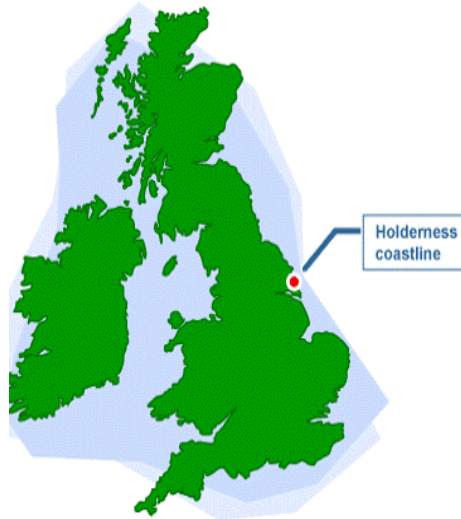
# How is climate change threatening the UK coastline?



- Rising sea levels are likely to have a severe impact on the UK coast by 2080.
- The frequency of intense storm events is expected to increase.

Leading to..... more coastal flooding and erosion.

5.3m people live on the coast in the UK and low-lying and soft-sediment coasts will be most vulnerable (e.g. in the east of England) because they are most easily eroded.



## Example: Holderness Coast

Causes of erosion






- Soft rock e.g. clay
- Storms / storm surges

## Impacts

- Cliff collapse - loss of businesses e.g. caravan sites & farms.
- Beach starvation from use of groynes.
- Loss of tourism e.g. beach erosion.
- Loss of homes

## Coastal Management

The money for coastal defences comes from the government. There is a limited amount of money so not everywhere can be protected.

Management Strategy	Advantages	Disadvantages
 <p>Sea wall</p>	<p>Protects the area behind the wall Can provide a promenade to walk on Helps prevent flooding</p>	<p>Very expensive Waves bounce off the wall and remove material from the beach Can look ugly</p> <p style="text-align: right;"><b>Hard</b></p>
 <p>Beach nourishment</p>	<p>Adds more material to the beach which widens beach and reduces the power of the waves as they approach Looks natural</p>	<p>Doesn't last long before it needs doing again</p> <p style="text-align: right;"><b>Soft</b></p>
 <p>Groynes</p>	<p>Helps to stop longshore drift which is the movement of material along a coastline Traps material and builds up beach</p>	<p>May create problems further along the coast as they starve other beaches of material</p> <p style="text-align: right;"><b>Hard</b></p>
 <p>Managed retreat</p>	<p>Allows the land to flood and becomes a marsh which acts as a buffer and reduces coastal erosion Creates new habitats</p>	<p>Land is lost Land owners need to be compensated Farmland may be lost</p> <p style="text-align: right;"><b>Soft</b></p>
 <p>Rock armour or Rip rap</p>	<p>Large boulders absorb the wave energy and reduce the power of the waves Reduces erosion</p>	<p>Strong waves can remove material from around the boulder Can look ugly Can be dangerous to walk on</p> <p style="text-align: right;"><b>Hard</b></p>

Shoreline management plans have been created in the UK for the next 100 years.

The key strategies are:

- 1) Hold the line: To protect places which have enough homes and businesses to make them worth protecting and to protect special places such as historical sites or nature reserves.
- 2) Managed retreat: Allow other places to be left to the sea but prepare people to cope with this