

Year 7 Geography Term 4 Coasts

Coast: The area where the land meets the sea

- Key terms-
- Erosion
- Weathering
- Longshore Drift
- Headlands
- Bays
- Beaches
- Spits
- Hard Engineering
- Soft Engineering
- Fetch
- Spring Tide
- Neap Tide

Waves - are a disturbance on the surface of the sea or ocean, in the form of a moving ridge or swell

What causes waves? The wind dragging across the top of the water. The longer and stronger the wind is blowing the bigger the waves will be.

Fetch - the distance travelled by wind or waves across open water. The longer the fetch the bigger the waves.

Where in the UK has the biggest Fetch?

There are two types of wave

Constructive - waves that have a stronger Swash (movement up the beach) so build a beach

Destructive -(movement down the beach) so take away the beach sediment.

Why is the coast important?

Coasts are important for many different reasons and for different groups of people. They provide:

- places to live
- places to work
- places to relax
- wildlife habitats
- beautiful scenery
- educational value, e.g., geology and natural history

Coastal processes

1. Erosion: The break down and wearing away of rocks, there are 4 types of erosion, these are:

- **Attrition** – rocks that bash together to become smooth/smaller.
- **Solution** – a chemical reaction that dissolves rocks.
- **Abrasion** – sandpapering effect of pebbles grinding over a rocky platform.
- **Hydraulic action** - water enters cracks in the cliff, air compresses, causing the crack to expand.

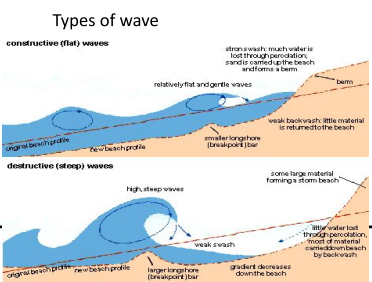
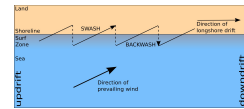
2. Weathering: The break down of rocks where they are, there are 3 different types of weathering:

- **Freeze-thaw weathering** – water enters cracks in the rock, when temperatures drop, the water freezes and expands causing the crack to widen. The ice melts and water makes its way deeper into the cracks. The process repeats itself until the rock splits entirely.



- **Chemical** – rainwater is slightly acidic. Over time a coastline made up of rocks such as limestone or chalk can become dissolved by the acid in the water.
- **Biological** – Due to the actions of plants and animals. Plant roots grow in cracks in the rock.

Longshore drift – the movement of sediment along a stretch of coastline. This happens in a 'zigzag' pattern.

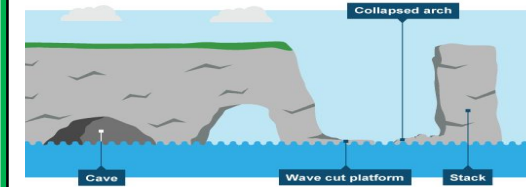


Landforms created by erosion: Headlands and bays



- 1) Waves attack the coastline.
- 2) Softer rock is eroded quicker than the harder rock, this forms a bay.
- 3) The harder (more resistant rock) is left jutting out to sea, this is a headland.

Caves, arches, stacks and stumps



- 1) Hydraulic action widens cracks in the cliff face over time.
- 2) Abrasion widens the crack to form a cave.
- 3) Further erosion in the cave forms an arch.
- 4) Weathering and erosion continues, the top of the arch is unsupported and the arch collapses leaving a stack.
- 5) Further weathering and erosion leaves a stump.

Landforms created by deposition:

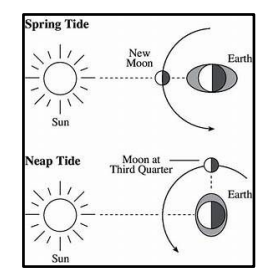
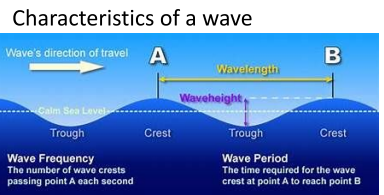
Beaches – created when waves have low energy and through longshore drift.

Spits

A spit is a long, narrow finger of sand and sediment that juts out from the coast.



1. Longshore drift transports material along the beach.
2. Deposition causes beach to extend, into a spit.
3. Change in prevailing (main) wind direction forms a hook.
4. Sheltered area behind spit encourages deposition, a salt marsh forms.



Tides- the alternate rising and falling of the sea, usually twice in each lunar day at a particular place, due to the attraction of the moon and sun.

High Tides- The highest point of the sea on land- this happens twice a day.

Low Tides- The lowest point of the sea on land- this also happens twice a day.

Neap Tides- occur twice a month when the Sun and Moon are at right angles to the Earth. When this is the case, their total gravitational pull on the Earth's water is weakened because it comes from two different directions.

Spring Tides- tide in which the difference between high and low tide is the greatest. Spring tides occur when the Moon is either new or full, and the Sun, the Moon, and the Earth are aligned. When this is the case, their collective gravitational pull on the Earth's water is strengthened.

Coastal management:

| Hard Engineering Defences | | |
|---------------------------|---|--|
| Groynes | Wood barriers prevent longshore drift, so the beach can build up. | <ul style="list-style-type: none">• Beach still accessible.• No deposition further down coast = erodes faster. |
| Sea Walls | Concrete walls break up the energy of the wave . | <ul style="list-style-type: none">• Long life span• Protects from flooding• Curved shape encourages erosion of beach deposits. |
| Gabions or Rip Rap | Cages of rocks absorb the waves' energy, protecting the cliff behind. | <ul style="list-style-type: none">• Cheap• Local material can be used to look less strange.• Will need replacing. |
| Rock Armour | Piles of large boulders, they force waves to break, absorbing their energy and protect the cliff. | <ul style="list-style-type: none">• Cheap• Easy to maintain• Makes area look interesting• Used for fishing• Rocks from abroad• Expensive to transport |
| Soft Engineering Defences | | |
| Beach Nourishment | Beaches built up with sand, so waves have to travel further before eroding cliffs. | <ul style="list-style-type: none">• Cheap• Beach for tourists.• Storms = need replacing. |
| Dune Regeneration | Sand dunes are buffers to the sea, marram grass is used to stabilise the dunes. | <ul style="list-style-type: none">• Keeps the coast looking natural• Cheap• People don't like being told not to walk on them• Damaged by storms |
| Dune Fencing | Fences built on sandy beach along existing dunes to encourage new sand dunes to grow. | <ul style="list-style-type: none">• Minimal impact on nature• Protects other ecosystems• Broken easily• Can look ugly |
| Managed Retreat | | |
| Managed Retreat | Low value areas of the coast are left to flood & erode. | <ul style="list-style-type: none">• Reduce flood risk• Creates wildlife habitats.• Compensation for land. |

Case study- Happisburgh (pronounced Haze-bro)

- Happisburgh, situated to the southern end of one of the most active stretches of the Norfolk coast, is one of the primary providers of sediment for beaches along the east Norfolk coast. The coastal part of the village is subject to frequent coastal erosion: houses that used to be over 20 feet (6 m) from the sea now sit at the edge of a cliff and are expected to fall into the sea.
- The civil parish shrank by over 0.2 km² in the 20th century by the erosion of its beaches and low cliffs. Groynes were constructed along the shore to try to stop erosion during the 1950s.
- Sea defences were built in 1959 to slow the erosion. Changes in government policy mean that coastal protection in Happisburgh is no longer fundable from central government. The road (Beach Road) that leads into the sea is being steadily eroded.
- A wooden revetment once stretched from Happisburgh to the Cart Gap seawall, but in 1990 a storm destroyed about 300 metres of it to the east of Happisburgh. The rate of erosion increased rapidly following the destruction of the wooden revetment.



Big Questions

- What are a main processes that affect the coastline?
- How have these processes affected people who live at the coastline?
- Why are coastlines so important to people in the UK?

| Key Words | Definitions |
|------------------|--|
| Erosion | The breakdown and wearing away of rocks |
| Weathering | The breakdown of rocks where they are |
| Longshore Drift | The movement of sediment along a stretch of coastline. This happens in a ‘zigzag’ pattern. |
| Headlands | An area of land that sticks out from the coast into the sea |
| Bay | A body of water partially surrounded by land. |
| Beach | A build up of sand which is created when waves have low energy and through longshore drift |
| Spit | Is a long, narrow finger of sand and sediment that juts out from the coast |
| Hard Engineering | Involves building artificial structures which try to control erosion from waves. |
| Soft Engineering | Is where the natural environment is used to help reduce coastal erosion |
| Fetch | The distance travelled by wind or waves across open water. The longer the fetch the bigger the waves. |
| Spring Tide | Occurs when the Moon is either new or full, and the Sun, the Moon, and the Earth are aligned. |
| Neap tide | Occurs twice a month when the Sun and Moon are at right angles to the Earth |
| Waves | Are a disturbance on the surface of the sea or ocean, in the form of a moving ridge or swell |
| Tides | The alternate rising and falling of the sea, usually twice in each lunar day at a particular place, due to the attraction of the moon and sun. |

Careers-
Coast Guard- responsible for the enforcement of maritime law and for the protection of life and property at sea.
Coastal Management- to preserve the coastal environment.
Tour Operator- A tour operator controls, books and devises the whole trip. They create a package holiday by combining all elements