Your notes

GCSE Geography: revision notes

Coastal landscapes

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Waves and weathering

- Waves are made by wind blowing over the sea. **Constructive waves** are low and gentle, with a strong swash and a weak backwash, so they build up beaches. **Destructive waves** are high and steep, with a weak swash and a strong backwash, so they remove material.
- Weathering breaks down rock where it is: mechanical (freeze–thaw), chemical (e.g. rainwater slowly dissolving chalk and limestone) and biological (e.g. plant roots).
- Mass movement is rock and soil moving downhill under gravity: sliding, slumping (a curved, rotational slip, common in clay cliffs) and rock falls.

Erosion, transportation and deposition

- Erosion: **hydraulic power** (waves force air into cracks), **abrasion** (waves throw rocks at the cliff), attrition (rocks knock together and become smaller and rounder) and solution (rock dissolves).
- Transportation: traction (large boulders roll), saltation (pebbles bounce), suspension (fine material is carried in the water) and solution (dissolved material).
- **Longshore drift**: the prevailing wind drives waves onto the beach at an angle. The swash carries material up the beach at that angle, and the backwash pulls it straight back down, so material zigzags along the coast.
- Deposition happens where the water loses energy, such as in sheltered bays.

Landforms

- Headlands and bays form where bands of hard and soft rock meet the sea: the soft rock erodes back into bays, leaving the hard rock sticking out as headlands.

- Cliffs retreat as waves undercut them, leaving a **wave-cut platform**. A crack in a headland is eroded into a cave, then an arch; when the arch collapses, a **stack** is left, which erodes into a stump. Examples: Old Harry, a chalk **stack** near Swanage in Dorset, and Durdle Door, an arch.
- Deposition forms beaches, sand dunes, **spits** and bars. A **spit** is a ridge of sand or shingle that grows out from the coast where it changes direction, such as Spurn Head at the mouth of the Humber. A bar is a **spit** that grows across a bay, trapping a lagoon behind it.

Coastal management

- Hard engineering: sea walls reflect waves but are expensive; **groynes** trap material moved by **longshore drift**, but can starve beaches further along; rock armour (large boulders) absorbs wave energy; gabions are cages filled with rocks.
- Soft engineering: beach nourishment (adding sand or shingle) and reprofiling, and dune regeneration (planting marram grass and fencing).
- **Managed retreat**: letting the sea flood low-value land, creating salt marsh that absorbs wave energy.
- Example: the Holderness coast erodes by about 2 m a year, one of the fastest rates in Europe. At Mappleton, a £2 million scheme in 1991 built rock armour and two rock **groynes**. It protected the village and its coast road, but reduced the sediment moving south, so erosion increased further along the coast, such as at Cowden.

Rates of change and coastal hazards (Eduqas)

- Geology: soft rock erodes faster than hard rock. On a **concordant coast**, rock bands run parallel to the sea (as at Lulworth Cove); on a **discordant coast** they meet it at right angles, forming headlands and bays (as at Swanage).
- The North Norfolk coast, made of soft clay and sand, erodes quickly; much of the Jurassic Coast is harder rock and changes more slowly. Eduqas suggests contrasting places like these.
- Climate: the prevailing wind direction and the **fetch** (the distance of open water the wind blows over) control wave size. Winter storms can cause sudden, dramatic change.
- Human activity: defences such as **groynes** can stop **longshore drift**, starving beaches further along and speeding up erosion there.
- Theme 4 (if your school chose it): coastal communities are vulnerable to erosion and flooding, made worse by storms and sea-level rise. Choices include holding the line, **managed retreat** and doing nothing.

Key terms

Constructive wave	A low, gentle wave with a strong swash that builds up beaches.

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Destructive wave	A high, steep wave with a strong backwash that removes material.
Hydraulic power	Erosion by waves forcing air into cracks in the rock.
Abrasion	Erosion by rocks being thrown against the cliff.
Longshore drift	The movement of material along the coast by waves.
Wave-cut platform	A flat, rocky area left at the foot of a retreating cliff.
Stack	A pillar of rock left standing in the sea when an arch collapses.
Spit	A ridge of sand or shingle growing out from the coast into the sea.
Groyne	A barrier built out into the sea to trap material moved by longshore drift.
Managed retreat	Letting the sea flood an area of low-value land in a controlled way.
Concordant coast	A coast where bands of rock run parallel to the sea. (Eduqas)
Discordant coast	A coast where bands of rock meet the sea at right angles, forming headlands and bays. (Eduqas)
Fetch	The distance of open water the wind blows over; a longer fetch makes bigger waves. (Eduqas)

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. Which type of wave builds beaches?
2. What is hydraulic power?
3. What is attrition?
4. What is longshore drift?
5. In what order does a headland erode?
6. What is Old Harry, near Swanage?
7. What is Spurn Head?
8. Why do bays form?

Answers

1. Constructive waves
2. The force of water pushing air into cracks in the rock
3. Rocks knocking together and becoming smaller and rounder
4. The movement of material along the coast by waves
5. Crack, cave, arch, stack, stump
6. A chalk stack
7. A spit at the mouth of the River Humber
8. Softer rock erodes faster than the harder rock around it

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What to do next

Practise 15 questions on this topic

Try 4 exam questions, with mark schemes

Read the lesson, one step at a time

Free revision for GCSE and KS3 at lycolearn.co.uk. Some notes are for one exam board only, and say so in brackets.

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