


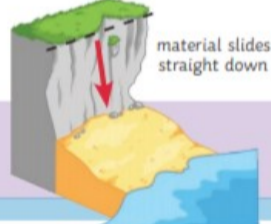

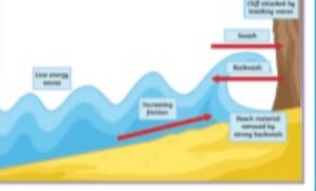
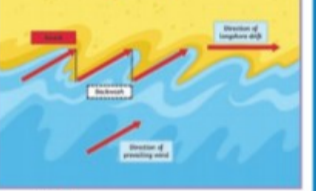
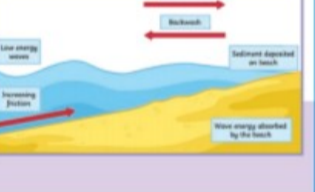


Coastal Landscapes in the UK Knowledge Organiser

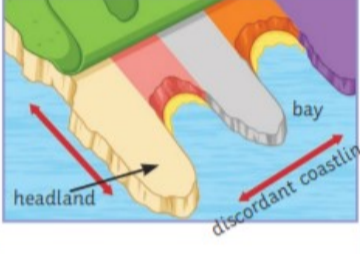
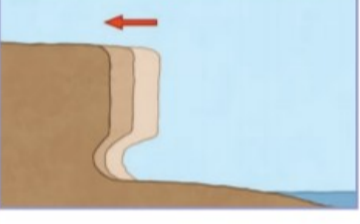

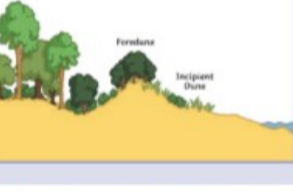




The Coast is Shaped by a Number of Physical Processes

Coastal Processes

Weathering Processes	Mass Movement (Sub-Aerial Processes)	Erosion	Transportation	Deposition	
<p>Mechanical weathering – rain and sea water expands when it freezes and turns to ice, then as temperatures rise again, the ice melts. This continual expansion and contraction can put pressure on rocks and break them apart. It is also known as frost shattering or freeze-thaw weathering.</p>  <p>Chemical weathering – this is when water reacts with minerals in rocks and the structure of the rock is changed. The best example is solution.</p> 	<p>The shifting of loose material down a cliff. There are three main types:</p> <p>Sliding – material shifts down a slope in a straight line.</p> <p>Slumping – saturated soil and rock move down the slope (with rotation) over impermeable rock.</p> <p>Rock falls – the base of the cliff is eroded, leaving the rock above unsupported. This breaks up and collapses.</p>  	<p>Hydraulic power – as the powerful waves smash into the cliff face, air is compressed in the small cracks in the rock. Tiny fragments of rock get blasted away as the process is repeated many times.</p> <p>Attrition – eroded material in the sea bumps into each other and eventually wear each other down. Over time, the material becomes smaller and more rounded.</p> <p>Abrasion – during storms, the strong waves pick up rocks, pebbles and sand. The material is then smashed into the cliff face. This can break off pieces of the cliff face.</p> 	<p>Destructive waves carry out erosional processes.</p> <p>Key characteristics:</p> <ul style="list-style-type: none"> steep and high waves; waves have a high frequency (10-14 waves per minute); the backwash is more powerful than the swash, removing material from the coast. 	<p>Longshore drift – material is moved along the coast:</p> <ul style="list-style-type: none"> waves travel in the same direction as the prevailing wind and hit the coast at an angle (swash); material is carried back down the beach at a right angle (backwash); material zig-zags along the coast. 	<p>Constructive waves deposit more material than they erode.</p> <p>Key characteristics:</p> <ul style="list-style-type: none"> low and long waves; low frequency waves (6-8 waves a minute); the wash is more powerful than the backwash, depositing material on the coast. <p>Material carried by seawater is deposited on the coast when the water loses energy. More material will be deposited when there is lots of erosion (e.g. after a storm) or when there is lots of transportation.</p> 

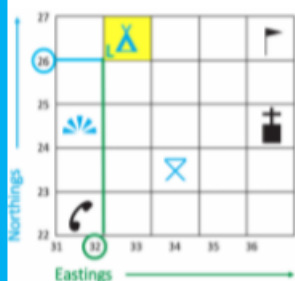
Coastal Landscapes in the UK Knowledge Organiser

Distinctive Coastal Landforms – are the result of rock type, structure and physical processes.

Erosional Landforms	Depositional Landforms	Example of UK Coastline
<p>Headlands and bays – when a coastline is made up of different types of rock, they are called discordant coastlines. The rocks will erode at different speeds. The less resistant rock is eroded faster, forming a bay. The more resistant rock is eroded slowly, forming headlands at either side of the bay.</p>  <p>Cliffs and wave-cut platforms – waves cause most erosion at the foot of cliffs creating a wave-cut notch. The rock above will eventually collapse and the cliff will retreat, leaving a wave-cut platform in front of the cliff.</p>  <p>Headlands are normally made of resistant rock which do not erode easily, but cracks can develop into caves, arches and stacks.</p> <p>Caves – hydraulic power and abrasion enlarge cracks in headlands creating caves.</p> <p>Arches – caves continue to erode until they break through the headland creating arches.</p> <p>Stacks – erosion will continue to weaken the rock supporting the arch until it collapses forming a stack.</p> <p>Stumps – continuing erosion will lead to the collapse of the stack, leaving a stump.</p> 	<p>Beaches</p> <ul style="list-style-type: none"> In sheltered bays, deposition of sediment often leads to the formation of sandy beaches with a gentle slope. If cliffs are being eroded and there are high energy waves, this could lead to the formation of a pebble beach with a steep gradient. The profile of a beach is unlikely to be smooth. At the top end of the beach you may find a storm beach where boulders and shingle have been deposited by the strongest waves in a storm. There may also be a line of shingle and sand below this called a berm – this marks the usual high tide. <p>Sand dunes – wind carries sand deposited by longshore drift up the beach to create sand dunes.</p> <p>Incipient Dune - grass covered and changing</p>  <p>Foredune - larger vegetation and more stable</p> <p>Hind Dunes - established soils, large vegetation, little affect from ocean spray/winds</p> <p>Spits – form at sharp bends in the coastline. Longshore drift doesn't turn the corner so it takes the sediment out to sea forming a long, sandy ridge known as a spit. As the ridge extends into more open water, it is affected by waves and wind. This leads to the tip of the spit curving. Eventually, the sheltered area behind the spit can become a mudflat or salt marsh.</p> <p>Bars – sometimes the ridge of sand can go all the way across the bay or river mouth; this is called a bar. A lagoon can develop behind the bar.</p>	<p>Chesil Beach The Dorset coast has many features of coastal erosion: A 30km tombolo (a type of bar which connects an island to the mainland) which encloses Fleet Lagoon.</p>  <p>Headlands and Bays Formed along a discordant coastline, where resistant rock forms headlands (Ballard Point and Durlston Head) and softer rock erodes to form bays (Studland Bay and Swanage Bay).</p>  <p>Old Harry Rocks A cave and a stack (Old Harry Rock) has been eroded from the chalk headland.</p>  <p>Photo courtesy of JOHN SIMPSON (via wikimedia commons) - granted under creative commons licence - attribution</p>  <p>Can I remember map skills</p>

4 FIGURE GRID REFERENCES

Along the edges of each map there are numbers. These numbers help you work out where a location is on a map. Northings are numbers that go from bottom to top, Eastings go from left to right.



The first two numbers give the eastings **32** **26** The second two numbers give the northings.

Remember... eastings then northings!

Along the corridor and up the stairs!

6 FIGURE GRID REFERENCES

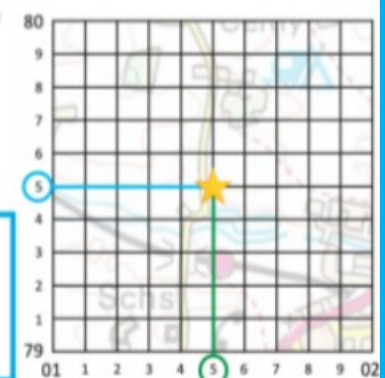
We can use six-figure grid references to find an exact location within a grid square, so they are much more accurate. The grid square is divided into tenths.

Example

015 795

The first three numbers give the easting which includes the number of tenths

The last three numbers give the northing which includes the number of tenths.



Blank space for sticking into book.

Coastal Management

The Costs and Benefits of Management Strategies

Hard Engineering

1. Sea Walls

Made out of hard material (e.g. concrete) to reflect waves back out to sea.

Pros – prevents coastal erosion and flooding.

Cons – expensive to build and maintain. Can cause greater erosion downdrift due to waves reflecting off seawall.

2. Rock Armour

Large rocks dumped to absorb and reflect wave energy.

Pros – allows material to be deposited.

Cons – expensive. Boulders need to be transported long distances (e.g. from Norway).

3. Gabions

Wire cages filled with rocks to form a wall.

Pros – cheaper and easier than many other management strategies.

Cons – the wire cages corrode over time. Can be considered to be ugly structures.

4. Groynes

Wooden/stone fences built at right-angles to the coast.

Pros – traps material transported by longshore drift.

Cons – can be costly. Can cause greater erosion downdrift.

Soft Engineering

1. Beach Nourishment and Reprofiling

Sand/shingle/pebbles shifted up the beach profile.

Pros – creates wider beaches which reduces erosion and flooding.

Cons – constant maintenance needed, especially after extreme weather/high tides.

2. Dune Regeneration

Creating/restoring sand dunes through beach nourishment or planting vegetation to stabilise sand.

Pros – provides a barrier between land and sea.

Cons – often limited to small areas as nourishment is expensive.

Managed Retreat – Coastal Realignment

Removal of sea defences to allow the formation of salt marshes.

Pros – cheap and easy. No maintenance. Prevents erosion and flooding elsewhere.

Cons – salt can alter ecosystems. Land and buildings will be lost – compensation cost could be high.

Lyme Regis Coastal Management:

Success: tourism and businesses are thriving, defences stood up to recent storms and harbour boats are protected.

Negatives: traffic caused by increased tourism, ruined natural beauty, less natural landslips exposing fewer ancient fossils.

Case Study: Lyme Regis



Key:
 1 = Beacon Rocks (rock armour) 2 = North Wall
 Rockery (rock armour) 3 = Rock groyne 4 = Beach
 nourishment 5 = Rock armour/groyne 6 = Sea wall

