

Knowledge box 1

Geography Plus: Beside the Sea

1

These knowledge boxes provide background information for teachers to help develop knowledge for teaching **Beside the Sea**.



The changing coastline

Coastal landforms

The coast is where the land, the sea and the atmosphere meet: a triple boundary. Physical processes (aerial, sub-aerial, terrestrial and marine) and human processes combine to impact on this ever-changing line that looks quite static on a map.

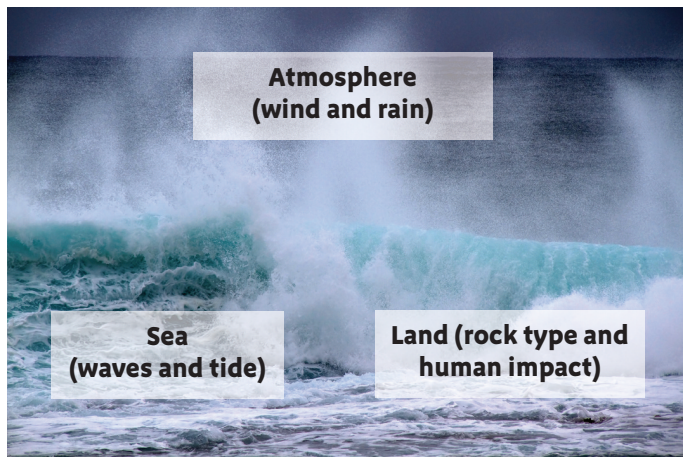


Photo © Tony Hisgott.

Factors which shape the coastline.

The interplay of these processes results in a wide range of coastal features, which can be broadly categorised as human or physical. Investigating these features offers an opportunity to explore UK geography.

The coastlines of the United Kingdom

- The coastline of Great Britain (mainland England, Wales and Scotland, plus their principal islands) is about 31,368km (19,491 miles) long.
- The coastline of mainland England is about 8982km (5581 miles) long. If you include the coastlines of the Isle of Wight, Lundy and the Scilly Isles, England's coastline is 10,077km (6261 miles) long.
- The coastline of mainland Wales is about 2120km (1317 miles) long. If you include the coastlines of Anglesey and Holy Island, Wales' coastline is 2740km (1680 miles) long.
- The coastline of mainland Scotland is about 6718km (4174 miles) long. If you include the coastlines of the islands of Arran, Islay, Jura, Shetland, Orkney and the Western Isles, Scotland's coastline is 18,588 km (11,550 miles) long. (Source: The British Cartographic Society.)
- The coastline of mainland Northern Ireland is about 650km (406 miles) long or 680km (425 miles) if you include the coastline of Rathlin Island. (Source: Department of the Environment (Northern Ireland).)

Physical features

The sea and the atmosphere shape coastal features, but how they affect them depends on the geology of the coastline. Coastlines composed of resistant rock wear away slowly; those with less-resistant rock much more quickly. Most erosion takes place in stormy conditions of high winds and powerful waves, like those experienced in the UK in January 2014 (see www.bbc.co.uk/news/uk-25587246). On other coastlines, deposition is increasing the land area. There is more information about the processes of erosion and deposition in **Knowledge box 2**.



Photo © Charlie Newey.

Storms in Aberystwyth, January 2014.

Human features

There are many large and small settlements, with a range of functions, along the coast. Some are engaged in transport, for example as ferry terminals (Southampton and Craginure). Some had defensive functions in the past and are now used as naval bases (Portsmouth). **Ports** where ships can dock and unload were established where there was a safe **harbour** away from the full force of the sea, and harbour walls were built to improve the shelter. Ports can range in size from a small fishing village to a massive international transport facility. Some, Liverpool and Bristol for example, have many associated industries and commercial functions and became great cities on the basis of their trading wealth. Although great cities grew up around the port, many port facilities have now been relocated to deeper water near the mouth of the estuary to accommodate large container ships. These pack their cargo in containers of a size that fits on trucks. Previously, goods were loaded and unloaded in smaller containers, which required much manual work by dock hands; containerisation has greatly reduced the time and cost involved in shipping. Historically, fishing ports were very important to the UK; nowadays their income is often based on fishing and tourism, in Padstow for example.

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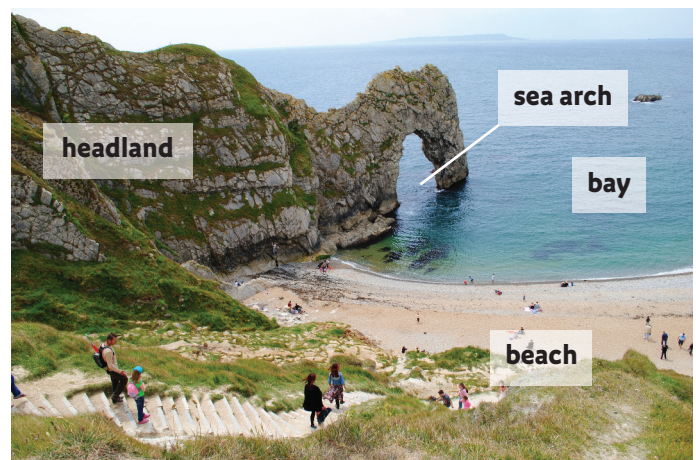


Grand Hotel and Pier, Llandudno.

Some coastal settlements, especially those with attractive scenery or sandy beaches, were developed specifically for tourism. Most of these seaside **resorts** were built during the Victorian era, when the railways made it possible to bring holiday makers from the big industrial cities. These Victorian resorts are often characterised by pleasure piers, as at Teignmouth and Llandudno. These were constructed to enable the holiday makers to experience the sea, which given the wide tidal ranges was out of sight of the beach for much of the day.

Seb Green's Odyssey

On his travels around the UK coastline, Seb would have walked along high level rocky **cliff** top coastal paths with spectacular scenery. Here the coastline is composed mainly of resistant rock, such as granite in Cornwall and chalk on the south coast. These cliffs retreat slowly, leaving behind a **wave-cut platform** where the cliff used to be. **Headlands** form where the sea encounters rocks of different hardness: the headland comprises resistant rock, which erodes relatively slowly, and a **bay** is formed in adjacent soft rock, where erosion is faster. Sand or shingle often accumulates in the bay to form a **beach**. **Lighthouses**, to guide sailors or warn them of rocks, are often located on headlands. Narrow headlands can be further worn away: waves enlarge cracks in the rock to form caves, and these can cut through the headland to form a **sea arch** (for example, Durdle Door). Eventually the top of the arch collapses to form a **stack** (for example, Bedruthan, Cornwall).



Durdle Door, Lulworth Cove, Dorset.



Stacks at Bedruthan, Cornwall.

Photo © Jim Linwood.

Photo © Neil Mullins.

Photo © Bryan Ledgard.

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As rising sea level and erosion gradually change the shape of the coastline, headlands can often become small islands, called **islets** (for example Eilean Musdile).

Some coasts have very soft cliffs, and erosion takes place very rapidly – for example, the Holderness Coast in East Yorkshire. Whole villages have disappeared and houses can fall down on to the beach. Central government and local councils are faced with the difficult choice of either committing significant sums of money to coastal defences, or leaving it to nature and allowing the erosion to continue unchecked.

Seb will have also have encountered very flat coastlines. These are characterised by depositional landforms, and rock can hardly be seen. Beach material comprises eroded rocks and shells, and can be fine grained **sand**, rounded pebbles (**shingle**) or rocky pebbles. They are mainly rounded: the corners have been worn away by the sea bashing them against each other. Waves breaking on the beach move the material up and down the beach. If the waves come in at an angle to the beach there is a movement of material along the beach known as **longshore drift**. When the coastline changes at a river mouth, the beach material builds up to form a **spit** (for example, Spurn Point): this can even grow across the river mouth to form a **bar**. The water behind the bar or spit is very calm, so fine grained material settles out to form a **mudflat**. Eventually plants colonise this mud and a **salt marsh** (as at Wells-next-the-Sea) forms, rich in plants and wildlife.

bar



Photo © Barry Lewis.

longshore drift



Photo © Rob Nunn.

cliff and wave-cut platform



Photo © David Evans.

lighthouse and islet



Photo © T P Holland.