

Investigating coasts KS1 & 2

Introduction

The UK is a maritime nation, with nowhere more than 70 miles from the sea, so it is self-evident that pupils should develop some knowledge and understanding about the environment where land and sea interact. Coasts provide a particularly appropriate context for exploring and investigating key geographical ideas and concepts, such as physical processes and human effects on the environment; physical changes can occur almost every day through the action of the tides. Thanks to seaside holidays and day trips, most children will have a shared understanding of the coast and its features, while those who are fortunate enough to live on or near the coast will be even more familiar with its character.

What do I need to know?

The coast is an environment where physical processes have a clear impact on human activities, and knowledge of these processes is a necessary prerequisite if you are to teach this unit confidently. The processes are not difficult to comprehend, however, and much rests on an understanding of waves, tides and their impact on different types of coastal features.

Waves and erosion



Waves are usually created by the action of the wind on the surface of the sea – the exceptions are tsunamis, which are the result of undersea earth movements. When waves reach the shore they can be either destructive or constructive. Destructive waves are high and have a great deal of energy. Constructive waves have less energy, and the action of the swash (a wonderful onomatopoeic word) can move material up a beach.

Waves erode softer rock on the coast into bays, leaving headlands of harder rock protruding into the sea. Erosion is at its greatest where large waves break against a cliff. Slowly the waves undercut the foot of the cliff, and over time it is undermined and collapses. As this process is repeated, the cliff will retreat, leaving an expanse of gently sloping rock at its foot. This area will be covered at high tide and exposed when the tide is out – it is the site of the rock pools that children love to explore on a rocky shore.

On headlands where resistant rocks have cracks and faults, erosion will widen any weakness to form, initially, a cave. If the headland is relatively narrow, eventually wave action will cut through to form a natural arch. As the waves continue to erode, sooner or later the roof of the arch will collapse, leaving an isolated stack.

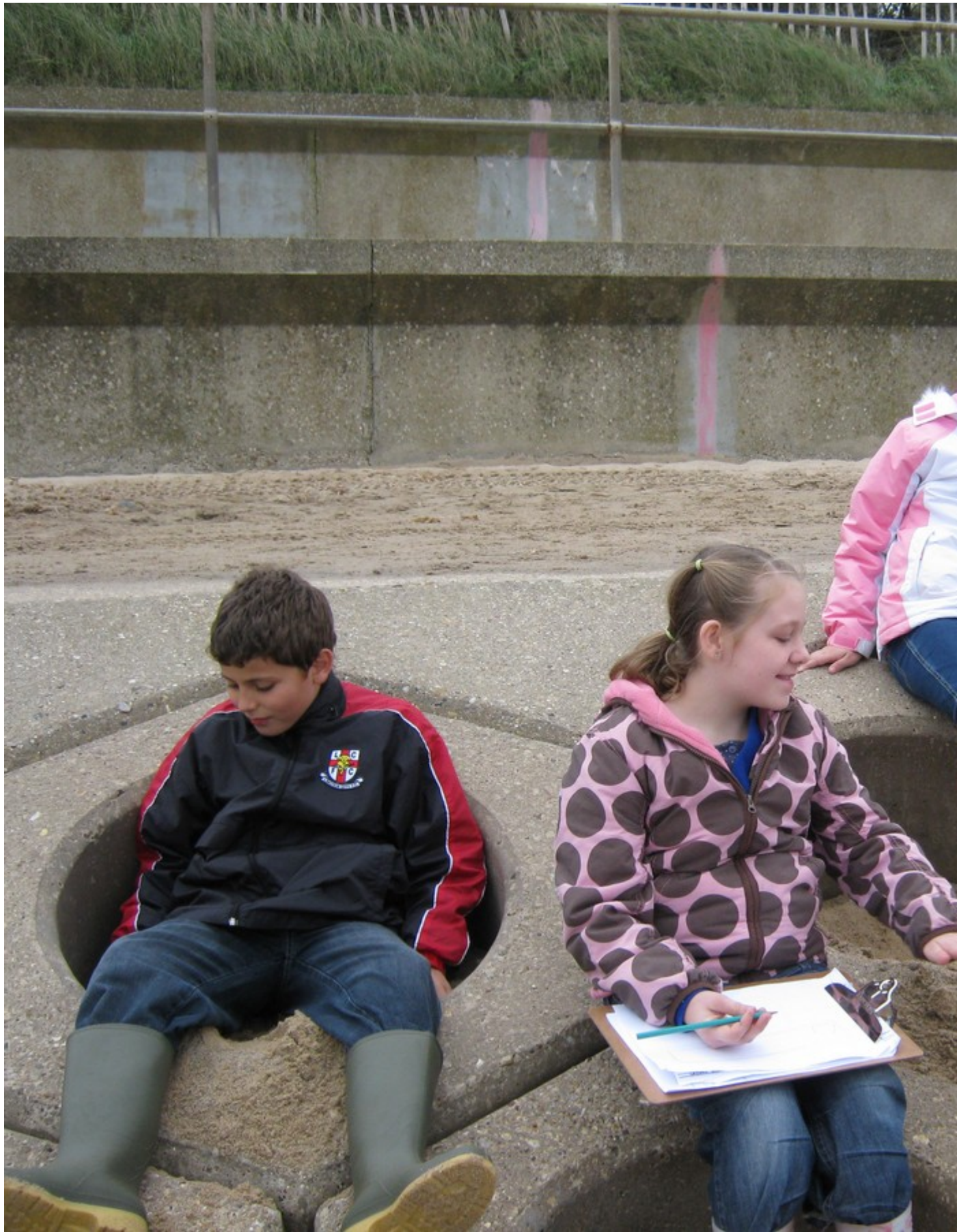
Because waves rarely approach a beach at right angles, they cause movement of material along the shore – longshore drift. Wooden barriers called groynes are built to slow down the movement.

Tides

The tide is the regular rising and falling of the sea's surface caused by changes in gravitational forces. At any point on the coast, there are normally two high tides and two low tides each day.

Video by Dylan Cook: *'Filmed on Freshwater East Beach, Wales, on the 5th August 2018 using a Canon EOS 1300D with a 15 second interval, between the times of 5:00am and 9:37pm. Shot at 5184 x 3456 and downsized to 4K. The camera was powered by a 24000mAh portable charger.'*

Human features



It is possible to categorise places on the coast by the types of human features which are evident there. In places such as river mouths and deep-water bays, fishing and trading ports have grown. In places with attractive beaches, tourist resorts have developed. Coastlines distant from population centres and/or unsuitable for ports have remained largely unspoilt. Such coasts still suffer from tourism pressures, however, and some have attracted attention as potential locations for wind farms.

Human features can contribute to erosion on the coast. Buildings on cliff tops can increase the instability of cliffs, resulting in landslips. Concrete sea walls are built at the base of cliffs, and gabions (huge metal baskets filled with stones and boulders) are placed to reinforce coasts threatened by erosion.

Misconceptions

Two obvious misconceptions may become apparent when children are investigating coasts:

- You may find that they do not understand the difference between waves and tides. It is important to emphasise that, although the waves appear to roll in and out constantly on a beach, the sea as a whole moves in and out from the shore twice a day by a much greater amount.
- Another misconception may arise from the use of simulations and diagrams of coastal processes – children may assume that these processes happen over a very short timescale. It is important to emphasise and re-emphasise that these are long-term processes.

Vocabulary

In his summary of research into the acquisition of geographical vocabulary in *Primary Sources: Research Findings in Primary Geography* (Scoffham, 1998), Ward points out that children's understanding of some taken-for-granted geographical terms may be imperfect, even at Year 6. He quotes research which found that words like 'cliff' and 'erosion' were only correctly defined by 30% of 11-year-old children. He also notes that some coast-related words are confusing because they are homonyms or homophonic words – 'beach', 'drift' and 'shore' are examples. It may help to clarify these terms by using good-quality visual images.

Starting points

Because most children will have a degree of familiarity with coastal environments, it is important to use their personal experience as a starting point for lessons and tasks. Images and maps can be used as prompts for recalling physical and human features observed at seaside locations. The clarification and use of key geographical terms will also be important. Getting the children to make concept or 'mind' maps of coast-related terms will be a useful precursor to the unit, as will a similar exercise at the end for assessment purposes. Do the children show a greater understanding of these terms at the end than at the start?

Teaching resources

You must be a GA member to access the materials below, so have your [login details](#) ready, or [join the GA](#).

[Activity 1: The effects of the tide](#)

The two outline sketches show part of the coast at Flamborough Head in North Yorkshire. Ask children to imagine how the coast will look at high tide and low tide, and then complete the sketches. Two annotations have been given to start them off. A photograph of the scene shown on the activity sheet can be [downloaded here](#).

For a more in-depth lesson plan for the idea above download: [Lesson plan: What changes occur on coasts every day](#).

[Activity 2: Coastal words](#)

This is an introductory activity requiring children to identify simple features found in coastal areas ([download these photos](#) showing a cave, headland, beach, arch and stack, cliff, wave cut platform). It also provides an opportunity for them to demonstrate their understanding of these features through providing a short description and locating a named example either using an OS map, reference books or the internet.

Ask the children to annotate the photographs from above with the appropriate features of the coastal scene. More information and diagrams of coastal processes can be found on the 3D Geography website on [this page](#) to help with this activity.

The activity can be extended by adding further features to investigate as appropriate. It is suitable for either a class-based or homework activity. It may also be helpful to discuss with your pupils how and why some of these features occur together in one location.

[Activity 3: Who goes where?](#)

Display or hand out to the children [these photos](#) showing a sandy beach, rocky headland and pebbly beach. Ask the children in pairs to work out the people who might visit the different types of coastal areas (fishermen, holiday-makers, local people out walking, surfers, beachcombers, nature photographers etc) and identify the sort of activities they might carry out. Remind them that some users may be attracted to more than one type of place, dog walkers for example. Pupils should try to name some of these coastal areas using personal experience, pictures, OS maps and atlases including a road atlas.

For each activity pupils should try to consider the possible impacts on the physical and human environment, including concepts such as litter, development, access, erosion and coastal protection.

An extension task could be for pupils to respond to the following statement: 'What if you owned all three stretches of coastline what would you do with them?' In leading the subsequent discussions elicit reasoning for any decision making and whether the proposed management and development will be 'best' for the coast line and all its users.