

### Questions

1. What WB describes a groyne?
2. What R are wooden slatted barriers built towards the back of the beach, usually parallel to the sea?
3. What BN is a form of soft engineering?
4. What OB are large blocks, often made of concrete, sunk some distance from the shore?
5. What E is a word which can be used to describe hard engineering methods of defending the coastline?
6. What MG is often planted to stabilise a sand dune?
7. What MR is where the land next to the sea is allowed to be flooded?
8. What SW are designed to reflect waves back off of the shore?
9. What C often arises between managing coastal erosion and meeting the needs of the local people?
10. What HC is a case study of coastal defences?
11. What WE is absorbed by gabions?
12. What T are sometimes used to stabilise cliffs?
13. What C of rocks describes gabions?
14. What RR is a form of rock armour sometimes called boulder barriers?
15. What LV is high in areas where there are many coastal defences?



Groynes on the Suffolk coast, © 2007 David J Morgan, [http://www.flickr.com/photos/tz1\\_1zt/1365786426](http://www.flickr.com/photos/tz1_1zt/1365786426)

### Answers

1. **Wooden barriers** – Groynes are wooden barriers built in parallel lines at right angles to the shore into the sea. They are designed to trap the sand and others materials transported along the beach by long shore drift.
2. **Revetments** – Revetments are often made of planks laid against wooden frames so they disrupt the force of the waves. Wooden revetments have now largely been replaced by modern concrete defence structures.
3. **Beach nourishment** – This process is also known as beach replenishment or sand replenishment and describes where eroded sediment (usually sand) is replaced from sources outside of the eroding beach.
4. **Offshore breakwater** – Offshore breakwaters are usually constructed from enormous concrete blocks and/or natural boulders which are sunk a short distance offshore. The structure has the effect of altering wave direction and reducing the force of the waves.
5. **Expensive** – Hard engineering schemes are unsustainable man made methods for defending the coastline. They rely on expensive short-term structures which reflect large amounts of wave energy and frequently may also have a high impact on the landscape.
6. **Marram grass** – Marram grass grows from a network of thick rhizomes which can grow outwards by up to two metres in six months. These rhizome roots give it a sturdy anchor in sand dunes and allow it to spread easily. One clump of Marram grass can produce up to 100 new shoots annually.
7. **Managed retreat** – Managed retreat is a form of soft engineering practised in areas of low economic value. The sea is allowed to erode and flood the land. Over time, salt marshes, mud flats and beaches develop.
8. **Sea walls** – These are an expensive hard engineering solution. The walls are usually constructed from reinforced concrete. They are designed to reflect the wave energy back into the sea, particularly if the design incorporates a curve top to the sea wall.
9. **Conflict** – Hard engineering methods of defending the coast are always an expensive option. The local population may object to the costs of such defences and question their need. Usually protecting the coast in one area actually transfers the problem further along the coast. Soft engineering methods although cheap mean that land is lost to the sea.
10. **Holderness coast** – Large areas of the Holderness coast are composed of glacial till which is easily eroded by the waves of the North Sea. Various methods of coastal defence have been used at places such as Mablethorpe and Hornsea.
11. **Wave energy** – As a wave hits the gabion, the sea water drains through the gaps between the rocks and boulders leaving sediments and these absorb some of the wave energy.

12. **Terraces** – This method is most suitable for cliffs composed of softer or less stable materials. The cliff is stabilised by constructing a series of steps or terraces across the cliffs to give them a stepped appearance. This helps to help prevent mass movement e.g. landslides.
13. **Cages** – Gabions are where rocks and boulders are encased in wired mesh. These cages are stacked at the base of the cliff to protect it from the force of the waves.
14. **Rip rap** – Rip rap is also known as rock armour. It usually consists of large boulders of resistant rock positioned at the base of the defended structure. It works by absorbing and deflecting the energy of waves.
15. **Land value** – Coastal defence schemes are an expensive option. Sea walls cost around £10,000 per metre depending on material, height and width. Rip rap costs approximately £3000 per metre and offshore breakwaters are estimated to cost £2,000 per metre. Consequently coastal defences are only built in areas of high economic land value.

### Teaching notes

Although this is primarily designed as an interactive Blockbuster game, it can be used as a set of questions for class use. The short answers from the Blockbuster are expanded above to provide additional detail for the examination topic of coastal management.