

KS5 - How feasible and effective might different coastal defences be?

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| Context | Feasibility studies are a somewhat underused way of students developing evaluation skills and contextualising geographies of management into real life situations. By approaching field sites (and their issues) more holistically and with knowledge across a broad range of geographical contexts, students can develop finely tuned skills and place specific suggestions for a new coastal management scheme in an otherwise unprotected area of coastline. | | |
| Length of time | One day, depending on location. | Suitable locations | Unprotected stretches of coastline that exhibit a degree of coastal defence need. |
| Equipment needed | Ranging poles, clinometer, tape measure, float and rope, thread | | |
| Suggested delivery | | | Key Skills |
| <p>Students can measure the feasibility of different coastal defences in a number of ways. Not all the measures listed below may be suitable for all field sites and students may wish to focus on just a few of the following and carry them out in greater depths.</p> <p>Beach morphology survey - Students can carry out a beach profile along several transects that, in their dispersal, allow for the length of coastline under consideration to be measured completely. Using ranging poles to mark the start and end points of each 5m section of a transect, students then use a clinometer to measure the gradient between said points. This continues along the transect, from shoreline to the backshore, before the process is repeated along the next transect. This will tell students whether one part of the beach may require a greater degree of defence from another, as a beach with multiple berms in the backshore would be thought to already possess high levels of natural defence for the coastline.</p> <p>Longshore drift survey - Using a float secured on a long rope line, students can measure how far it travels on the surface of the waves over a set time period. The float is thrown into the water at a known point and the distance between this and its rest point at the end of the set time is measured using a tape measure. It is recommended that students do this several times so that distances can be averaged. This will tell students in which direction longshore drift occurs as well as its strength and feasibility, and how far sediment would travel in the same time period.</p> <p>Wave and wind survey - Students can measure the dominant wind direction by holding a piece of thread at one end above their heads and record the main direction in which the thread moves by the wind using a compass. Remind students that the wind direction is recorded as where the wind originates from, not where it is blowing towards. This would tell students which parts of the coastline might be most vulnerable to oncoming waves. Students can also measure the wave period (by timing the time it takes for successive waves to pass a fixed point such as a support for a pier) and wave height (by estimating the difference between the trough and crest of the wave as it passes the fixed point). This will inform students of the energy of the waves and the height that sea defences may need to be.</p> <p>Amenity / environmental impact survey - Students can devise their own bipolar scoring survey to assess the extent to which any particular sea defence may enhance or lessen the human and natural experience of the area. This may cover aspects such as visual attractiveness, access to the beach and secondary uses as well as environmental impacts such as water quality, wildlife habitats etc. Students then complete the survey with a particular coastal defence in mind and continue to repeat it for other forms of coastal defence or other options. Students would come up with several numerical impact scores which can be compared with each other.</p> | | | <ul style="list-style-type: none"> • Students are required to evaluate different coastal defences against one another in the context of the specific location. • Students can use the range of measures of physical processes to design a unique coastal defence plan with justifications coming from their primary data. • Students should recognise that taking one set of measurements of physical processes on one day is not enough to form a well-rounded picture of the physical defence needs of a location. |
| Potential risks to consider | <ul style="list-style-type: none"> • The position of the tides at the time of the activity, how high they are and are likely to get and when the peak high tide will be. • Discarded items on the beach (or those brought onshore by the waves) may pose a health and safety risk. | | |
| Possible follow-up activities | <ul style="list-style-type: none"> • In groups, students can design a management plan specific for the coastal location and do a presentation to other students. The group can also research current financial costs of such a plan and whether the cost of the defences is justifiable when one considers the cost of losing land (and possibly property in the coastal zone). • Using a conflict matrix, students can think about the different people who may be affected by their coastal defence plan and estimate who may be in favour or against such a plan and why. | | |
| Useful links | Environment Agency: Cost estimation for coastal protection Long-term costing tool for flood and coastal risk management - GOV.UK (www.gov.uk) | | |

These resources have been created by the Fieldwork and Outdoor Learning Special Interest Group.