Finn’s Coastal Explorer Challenge: Shaping the Shoreline

Learning objective: To identify and explain the processes of coastal erosion and deposition, and how these shape the British coastline.

Finn the dolphin has been mapping the coastline. Below is a list of coastal landforms and processes. Your task is to act as a coastal scientist. Sort the items into two categories: 'Erosional Features' (created by the sea wearing away rock) and 'Depositional Features' (created by the sea dropping sand and sediment). Then, complete the analytical questions to demonstrate your understanding of these dynamic environments.

Word bank: Arch · Spit · Wave-cut platform · Sand dune · Stack · Beach · Hydraulic action · Longshore drift

1. Sort the word bank items into a table with two columns: 'Erosional Features/Processes' and 'Depositional Features/Processes'. (4 marks)

2. Explain why a 'stack' is often considered a temporary feature of a coastline. What might happen to it over time? (3 marks)

3. Compare and contrast how a 'spit' is formed compared to a 'wave-cut platform'. What is the primary difference in the energy of the water involved? (4 marks)

4. Justify why coastal managers might choose to build sea defences near a village, but allow natural erosion to continue in an unpopulated bay. (3 marks)

5. If a local shop owner loses £2,500 worth of stock due to coastal flooding, and the council spends £12,000 on new sea walls, what is the total cost of these coastal events? (2 marks)

6. What might happen to the shape of a coastline if the sea level continues to rise due to global temperature changes? Predict two long-term environmental consequences. (4 marks)

Draw: Draw a cross-section diagram of a headland. Label the following features: 'Cave', 'Arch', and 'Stack'. Use arrows to show where the waves are crashing against the cliff face.

Extension challenge: Design a 'Coastal Management Plan' for a fictional seaside town. You have a budget of £50,000. Research or suggest three different methods to protect the coastline (e.g., groynes, sea walls, or beach nourishment) and justify your choices based on their effectiveness and cost.