

Waves

Coast

The coast is land that is next to, or close to, the sea.

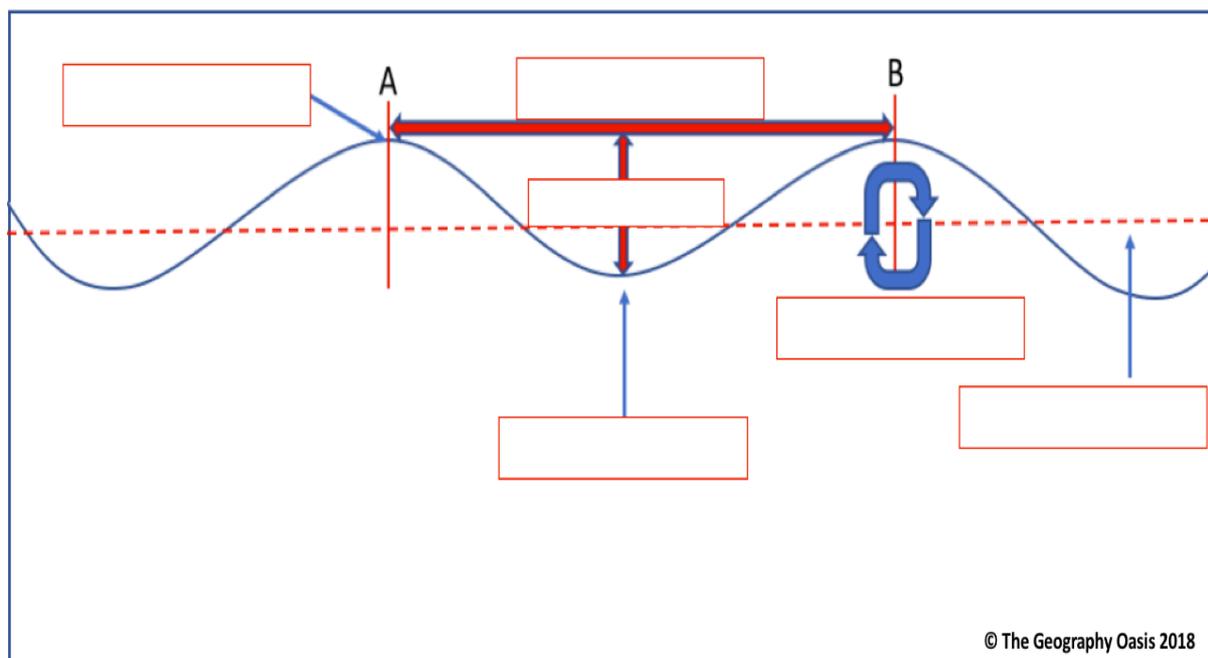
Waves

A wave is a long body of water curling into an arched form that finally breaks on the shore. Waves are generated by a transfer of energy from the wind into a body of water.

Key Characteristics of a wave

KEYWORDS	DEFINITIONS
Trough	The lowest part of the wave.
Crest	The highest part of the wave.
Wavelength	The distance between two successive crests.
Circular motion	Waves have a circular orbit or motion.
Wave height	The vertical difference between the trough and crest.
Still water level	The level the sea would be at if there was no wind and therefore no waves.
Wave frequency	The number of waves breaking on a beach per minute.
Swash	The rush of seawater up the beach after the breaking of a wave.
Backwash	The flow of seawater back down the beach and into the sea. This is caused by gravity.

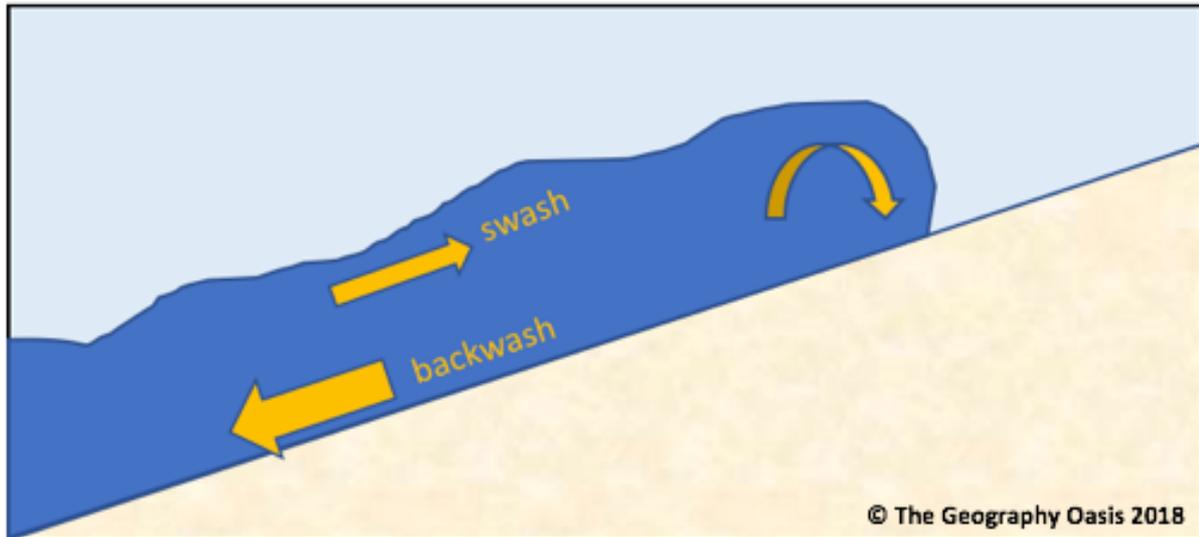
ACTIVITY: Read the keywords above and add them to the correct place on the diagram on below.



The Two Types of Wave

1. Destructive Waves

These are large and powerful waves that erode the coastline and create landforms such as headlands, bays, caves, arches, stacks and stumps.



2. Constructive Waves

These are smaller and less powerful. They deposit material along a coastline and create landforms such as beaches, spits and bars.



ACTIVITY: Read the paragraph below and select the correct answers from the options provided.

Destructive waves are **flat/tall** and powerful waves that **erode/build** the coastline. They crash down on to beaches and drag material away with them. This means that their backwash is **greater/weaker** than their swash. Their power is generated from gravity due to

their large wave height and short wavelength. Due to this short wavelength, they have a **high/low** wave frequency with between 10 and 15 waves breaking on the shore per minute. They create **flat/steep** beaches.

Constructive waves are much **stronger/weaker** than destructive waves. Their swash is **greater/weaker** than their backwash and this results in new material being deposited onto the coastline. This often creates wide, **flat/steep** beaches. They have a lower wave height and a greater wave length. This means that waves are **frequent/infrequent**, with an average of 10 waves or fewer per minute.

ACTIVITY: Read the statements in the table to decide if they relate to destructive waves, constructive waves, or both. Tick the correct option.

STATEMENT	DESTRUCTIVE	CONSTRUCTIVE	BOTH
<i>Erode the coastline</i>			
<i>Create wide, flat beaches</i>			
<i>Infrequent waves per minute</i>			
<i>Backwash is great than swash</i>			
<i>High wave height</i>			
<i>Break onto the coastline</i>			
<i>More dangerous to humans</i>			

Factors that influence the type of wave

Wind speed- If the wind speed is greater than the wave speed then energy will be transferred from the wind to the wave. The higher the wind speed the greater the transfer of energy and the more destructive the wave will be.

Duration of wind- The longer the wind blows, the more time it will have to transfer energy and build waves.

The Fetch- The distance travelled over open water by a wave before it hits a coastline. The larger the fetch, the larger the wave.

ACTIVITY: Study the diagram below and answer the questions that follow

A map to show waves hitting the coastline of the UK



Free world maps produced by [mapswire](https://www.mapswire.com/) (free commercial use)

Which area (A,B,C,D) is likely to receive the highest proportion of destructive waves? Explain your answer.

Which area (A,B,C,D) is likely to receive the highest proportion of constructive waves? Explain your answer.

Where would you choose to locate a surfer training centre? (A,B,C,D). Explain your answer.

Where would you choose to locate an ocean power plant that generates energy from waves? (A,B,C,D). Explain your answer.

Where would you choose to locate a new tourist resort? (A,B,C,D). Explain your answer.