



How Waves and Tides Reshape Our Coastlines

KS4 GEOGRAPHY

PHYSICAL GEOGRAPHY

COASTAL PROCESSES

Ages 11-14 ⌚ 3 min read

What Are Waves and Tides?

Waves are moving lines of water created by **wind** pushing across the ocean's surface. **Tides** are much larger, slower movements of water caused by the **Moon's gravity** pulling on our oceans. While waves happen every few seconds, tides happen twice a day. Together, they're like nature's construction crew, constantly reshaping our coastlines.

Think of it like: Waves are like someone gently splashing water in a bathtub, while tides are like slowly draining and filling the whole tub.

How Do Waves Shape Coasts?

When waves crash against rocks and beaches, they carry enormous power. Over time, this **wave energy** breaks down cliffs into smaller rocks and pebbles through a process called **erosion**. Waves also transport sand and pebbles along the coast, creating beaches in some places and leaving bare rock in others. The **strongest waves** happen during storms, when wind is fiercest and can move hundreds of tonnes of material.

Waves also help **deposit** material—meaning they can build up beaches by dropping sand in new locations. This balance between erosion and deposition is constantly changing our coasts.

Think of it like: A wave is like a giant hand repeatedly pushing and smoothing a piece of clay, slowly wearing it away into a new shape.

How Do Tides Change Our Coasts?

Tides create **tidal currents**—strong flows of water that move material along the seabed. Over weeks and months, these currents can move enormous quantities of sand and sediment. Places with the **highest tides** (called **spring tides**) experience the most dramatic changes. During **neap tides** (the smallest tides), the coast changes much more slowly.

Tides also expose different parts of the shore at different times. This means plants and animals must adapt to being underwater sometimes and dry other times.

Why Does This Matter?

Coastal erosion is a real problem for human communities. Millions of people live in coastal towns that could eventually disappear underwater. Some coastlines lose **several metres of land every year**. By understanding how waves and tides work, scientists can help protect our communities through barriers and better planning.

Our coasts are constantly alive and changing—shaped by forces we can see and feel every time we visit the beach.