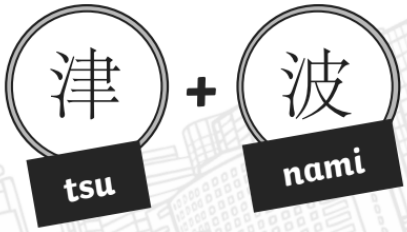
Tsunamis

Tsunamis are one of the most powerful and destructive natural forces on planet Earth.

Origin of the Name

The word tsunami is pronounced 'soo-nah-mee' and it originates from two Japanese words: 'tsu' meaning 'harbour' and 'nami' meaning 'wave'. Therefore, tsunami translates as 'harbour wave' – a name given to this natural phenomenon due to the fact that they only seem to become visible when near the coast.



Tsunami or Tidal Wave?

Often, tsunamis are mistakenly called 'tidal waves'. However, they are not related to the tides, which are controlled by the Moon and the Sun.

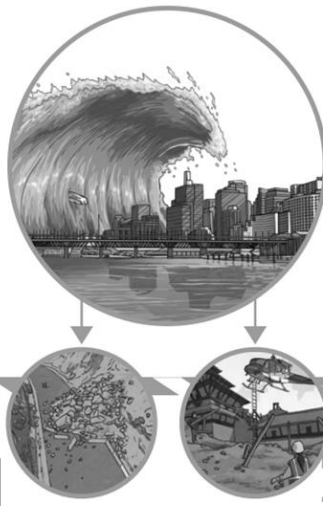
Tidal waves are shallow water waves which can be large in size but are always controlled by the Moon and the Sun. The waves are shallow and the energy moving within them comes from the wind. Tidal waves can only ever reach a limited size and speed.

A tsunami is a series of much larger waves. These waves are caused by the movement of a large amount of energy through the water, but this energy does not come from the wind. Instead, the energy is caused by an underwater volcanic eruption, an underwater landslide or, most commonly, an earthquake on the ocean's floor.

How a Tsunami Is Formed

A huge amount of energy under the water tries to travel to the ocean's surface. As it does, it pushes water up with it and this causes the sea level to rise. However, **gravity** pulls this water back towards Earth. This spreads the energy out to the sides. Water begins to race towards the land at speeds of up to 500 miles per hour, which is faster than an aeroplane can travel. The waves can cross an entire ocean in less than one day without losing energy.

When the tsunami is far away from the shore, it can be hard to spot. This is because the energy is moving through the entire depth of the water and the waves of the tsunami can be as small as one metre tall. However, as the tsunami gets closer to shore and the water becomes shallower, there is less water for the huge amount of energy to move through. This causes the waves to slow down and the water to become much taller.



If the trough of the tsunami reaches the shallow water of the shore first, it can make the ocean seem as if it is withdrawing back on itself much further than normal. It is this phenomenon, coupled with the unrivalled height of the waves created (around ten times of those seen during average storms), that are key features of a tsunami.

Destructive Power

It is not always possible to spot a tsunami due to their quick yet barely noticeable journey across the ocean. As humanly constructed defences cannot to stand up the sheer power of the tsunami, immediate devastation occurs. Boulders are lifted, buildings are destroyed and vehicles are swept away as the water races up to one mile inland before retreating back away from the coast.

Additionally, contrary to popular belief, a tsunami is not just one wave (it is a series of waves commonly known as a 'wave train') and it is not always the first wave of a tsunami which is most destructive. As tsunami waves are very long, they can reach the shore as far as one hour apart, giving survivors a false sense of security.

Preventative Measures

As trying to stop a tsunami is futile, scientists focus instead on developing ways of detecting tsunamis earlier so that people can be safely evacuated. They use advanced systems to monitor underwater activity which may indicate an earthquake or eruption is imminent and they invest time and effort into ensuring that global communication systems are quick, effective and extensive.