# HOW TSUNAMIS WORK

TRANSCRIPT

In 479 BC, when Persian soldiers besieged the Greek city of Potidaea, the tide retreated much farther than usual, leaving a convenient invasion route. But this wasn't a stroke of luck. Before they had crossed halfway, the water returned in a wave higher than anyone had ever seen, drowning the attackers. The Potidaeans believed they had been saved by the wrath of Poseidon. But what really saved them was likely the same phenomenon that has destroyed countless others: a tsunami. Although tsunamis are commonly known as tidal waves, they're actually unrelated to the tidal activity caused by the gravitational forces of the Sun and Moon. In many ways, tsunamis are just larger versions of regular waves. They have a trough and a crest, and consist not of moving water, but the movement of energy through water. The difference is in where this energy comes from. For normal ocean waves, it comes from wind. Because this only affects the surface, the waves are limited in size and speed. But tsunamis are caused by energy originating underwater, from a volcanic eruption, a submarine landslide, or most commonly, an earthquake on the ocean floor caused when the tectonic plates of the Earth's surface slip, releasing a massive amount of energy into the water. This energy travels up to the surface, displacing water and raising it above the normal sea level, but gravity pulls it back down, which makes the energy ripple outwards horizontally. Thus, the tsunami is born, moving at over 500 miles per hour. When it's far from shore, a tsunami can be barely detectable since it moves through the entire depth of the water. But when it reaches shallow water, something called wave shoaling occurs. Because there is less water to move through, this still massive amount of energy is compressed. The wave's speed slows down, while its height rises to as much as 100 feet. The word tsunami, Japanese for "harbor wave," comes from the fact that it only seems to appear near the coast. If the trough of a tsunami reaches shore first, the water will withdraw farther than normal before the wave hits, which can be misleadingly dangerous. A tsunami will not only drown people near the coast, but level buildings and trees for a mile inland or more, especially in low-lying areas. As if that weren't enough, the water then retreats, dragging with it the newly created debris, and anything, or anyone, unfortunate enough to be caught in its path. The 2004 Indian Ocean tsunami was one of the deadliest natural disasters in history, killing over 200,000 people throughout South Asia. So how can we protect ourselves against this destructive force of nature? People in some areas have attempted to stop tsunamis with sea walls, flood gates, and channels to divert the water. But these are not always effective. In 2011, a tsunami surpassed the flood wall protecting Japan's Fukushima Power Plant, causing a nuclear disaster in addition to claiming over 18,000 lives. Many scientists and policy makers are instead focusing on early detection, monitoring underwater pressure and seismic activity, and establishing global communication networks for quickly distributing alerts. When nature is too powerful to stop, the safest course is to get out of its way.

1. **Listen and pay attention to words.**
   **- Highlights those whose pronunciation seems difficult or surprising to you.**

2. **Read and choose another colour to highlight the words you don't understand.**

3. **develop your strategies...**
   **- Read and find the words meaning :**

| | | | | | |
|---|---|---|---|---|---|
| malchanceux | | Causer la mort | | Peu profond | |
| Un creux | | Un canal | | La profondeur | |
| Une crête | | De façon trompeuse | | Le plus meurtrier | |
| efficace | | Créer un haut fond | | La colère | |
| assiéger | | De faible élévation | | Une digue, un brise lame | |

– **try to find a translation for the words below (don't use the internet, it would be unefficient for the development of your language skills!)**

| | | | | | |
|---|---|---|---|---|---|
| The tide (l1) | | To slip (l12) | | To rise (l18) | |
| A stroke of luck (l2) | | To raise (l13) | | To withdraw (l20) | |
| To drown (l3-21) | | The shore (l15) | | To drag (l23) | |
| Countless (l5) | | Barely (l16) | | A path (l24) | |
| Unrelated (l6) | | The height (l18) | | A flood gate (l27) | |
| | | | | To divert (l27) | |