

# Explore Tsunamis!

## phenomenal science

On **December 26th 2004**, a massive **tsunami** rose from the Indian Ocean. This **tsunami** was one of the most destructive natural disasters anyone had ever seen before. Where did these disastrous waves come from, and how was this **tsunami** able to hit so quickly, without warning?

There are several different situations that can cause a **tsunami**: **underwater volcanic eruptions**, **meteor strikes**, **coastal landslides**, and, most commonly, **underwater earthquakes**.

Earthquakes that cause **tsunamis** involve the earth's **tectonic plates**. These plates are constantly moving over and under one another. The upper plate can get stuck on the lower one, building pressure. When the pressure grows large enough, the upper plate will snap upwards *very* quickly. When the plate snaps up by several inches, it also pushes an entire section of the ocean with it. This part of the ocean will suddenly be several inches above sea level. Once this spike happens, the water will spread out in order to restore equilibrium. This bump will spread out with incredible speed, moving at *hundreds of miles per hour*. When the wave reaches the shallower waters of the coast, the compressed energy of the wave will transform it into a **tsunami**. A typical **tsunami** approaching land will slow down to speeds of 30mph as the wave grows to *heights of up to 90ft above sea level*. A **tsunami** almost always promises flooding, destruction, and sometimes loss of life.

Scientists have the equipment to detect underwater earthquakes, just before a **tsunami** can hit the coast. However, because these giant waves form so quickly and hit coastal areas at hundreds of miles per hour, these detections often come too late. If you live near the coast, be aware of **tsunami zones**. Make sure your family has a plan in case you are caught near the wave.

## Historical Tsunamis

1755

### Lisbon Tsunami

Following the devastating Lisbon earthquake, the tsunami nearly destroyed the Portuguese city of Lisbon.

1883

### Krakatoa Tsunami

The volcanic island of Krakatoa destroyed two-thirds of the Indonesian island, and sent high waves across the Indian Ocean, killing 36,000 people.

2004

### Indonesian Tsunami

Over 230,000 people in 14 countries died after this tsunami hit. It was one of the deadliest natural disasters in recorded history.

2011

### Tohoku Tsunami

Following one of the most powerful earthquakes, a series of giant tsunamis hit Japan. The disaster cost Japan 15,000 lives and \$235 billion in economic loss.

## Safety Tips

1

If you live near the coast, look up your local tsunami broadcast.

2

Be aware of nature's warning signs. Tsunamis often follow after earthquakes, landslides near the coast, volcanic eruptions, and meteor strikes.

3

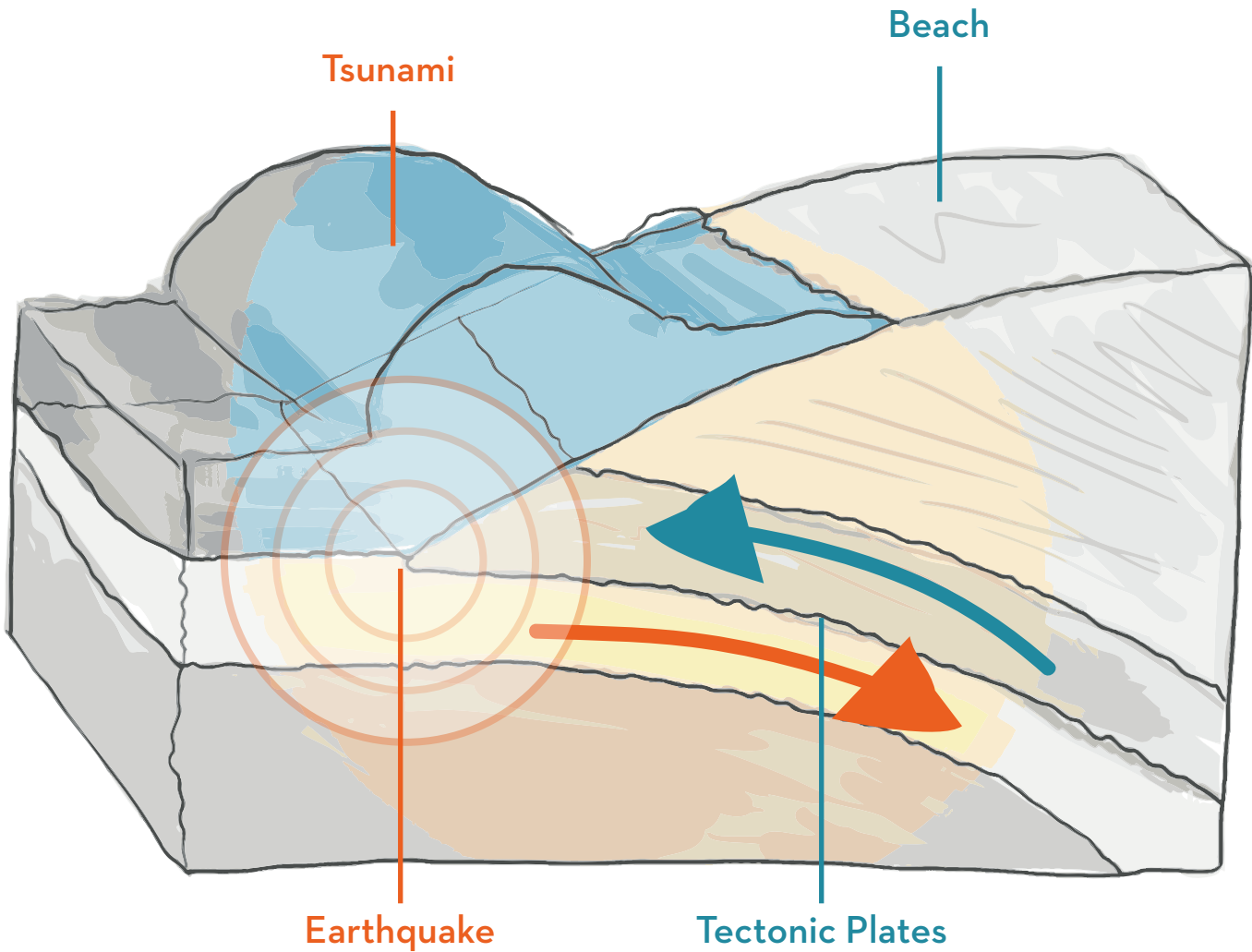
If you see a tsunami happening, leave the beach immediately and go to higher ground.

4

If you don't have an emergency kit, help your family put together one that includes a first aid kit, a supply of fresh water and canned food.

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**After reading the article on tsunamis, please answer the following questions:**

Name two different events that would cause a tsunami. \_\_\_\_\_

How do tectonic plates cause earthquakes? \_\_\_\_\_

What are some ways you can prepare for a tsunami? \_\_\_\_\_