

Tsunamis and Printmaking (Part 1)

As seen on Deep Sea Learning with
Georgia Aquarium

Key terms:

- **Tsunami:** Large ocean waves created by a disturbance in the water like underwater earthquakes, volcanic eruptions, landslides and glacier calvings.
- **Tectonic plate:** A massive, irregularly shaped slab of solid rock, generally composed of continental and oceanic lithosphere.
- **Lithosphere:** The rigid outer part of the earth, consisting of upper crust and mantle.
- **Wavelength:** The distance between two peaks in a wave.
- **Surge:** A sudden powerful forward or upward movement, especially by a crowd or a natural force such as a wave or tide.

Image courtesy of weather.gov



- About 80 percent of all tsunamis happen in the Pacific Ocean's "Ring of Fire," a geologically active area where **tectonic** shifts make volcanoes and earthquakes common.
- When the ocean floor at a plate boundary rises or falls suddenly, it displaces the water above it and launches the rolling waves that will become a tsunami.
- Tsunamis race across the sea at up to 500 miles (805 km) per hour—about as fast as a jet airplane. Their long **wavelengths** mean they lose very little energy along the way.
- In the deep ocean, tsunami waves may appear only a foot in height.
- As they approach a shoreline and enter more shallow water, they slow down and begin to grow in energy and height. The tops of waves move faster than the bottoms do, which causes them to rise.
- Sometimes reaching heights of over 100 feet (30.5m), the **surge** can cause widespread destruction when it crashes ashore.

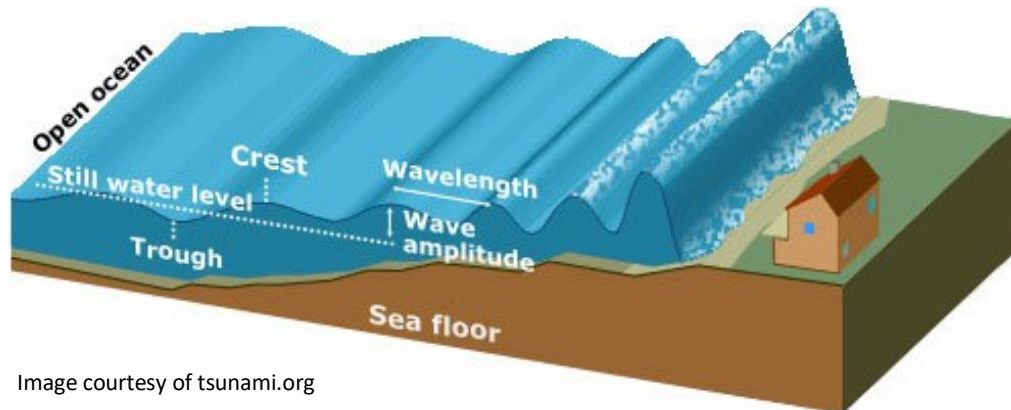


Image courtesy of tsunami.org

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Activity materials:

- Document for recording trial observations (digital or paper)
- Container that can hold water (preferably rectangular or square in shape)
- Recycled paper or newspaper
- Crayola Model Magic or clay
- Model houses
- Plants (live or faux to represent mangroves or maritime forests)
- Pitcher or bucket of water
- Cardboard panel

Activity wrap up

- Compare and contrast your observations from each trial.
- Formulate a theory about why the results were different for the coastal community.
- Research the effects on mangrove forests in coastal environments hit by tsunamis.
- Present your findings to the class.

Activity instructions—trial 1

1. Crumble the recycled paper or newspaper and pack it inside one end of the rectangular container.
2. Cover the recycled paper with Crayola Model Magic or clay to represent coastal land. Be certain to include a slope from the land into what will be the ocean.
3. Place your model houses on top of the Model Magic or clay to represent a coastal community.
4. Fill the rectangular container with enough water on the open end to reach the point just below where the slope meets the land.
5. Hold and insert the cardboard panel parallel to the oceanic end of the container.
6. Using the bottom edge and flat surface of the cardboard panel, gently but firmly fan the water toward the coast. This will represent your tsunami.
7. Observe and record your results.

Activity instructions—trial 2

1. Drain the water.
2. Add the plants to the area where land meets slope. This will represent a mangrove forest.
3. Reset the coastal community.
4. Repeat steps 4-7.
5. Clean up.

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