



THE
CHILDREN'S MUSEUM
AT LA HABRA

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Investigating the Mechanics of Tsunamis

Overview

Using a length of rain gutter filled with water, students will explore the link between earthquakes and tsunamis.

Processes/Skills

- Observing
- Predicting
- Researching
- Analyzing
- Recording

Recommended For: Grade K-3

Time Required: One hour (plus preparation of rain gutter)

Materials Required:

- Observation checklist (attached)
- 8-10 foot length of rain gutter, capped at either end and filled with water (a small, narrow aquarium would work too)
- Dirt, stones, and small pieces of Styrofoam to use in tsunami simulation. The dirt and stones are piled at one end to simulate land. Styrofoam or similar can be used to represent boats.
- Stopwatch and ruler.

Connecting to the Standards

- Language Arts
 - S.L. 1. Participate in collaborative conversations with diverse partners about *grade 2 topics and texts* with peers and adults in small and larger groups.
 - S.L. 2. Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.
- Mathematics
 - 2.MD.A.1. Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
- Science
 - 2-ESS2-1. Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.

Activity Objectives

- The learners will (TLW) learn about tsunamis and their connection with earthquakes.
- TLW see how an earthquake can cause a tsunami and the tsunami's effect on land and man-made structures.

Main Activity, Step-by-Step Procedure

1. Teacher will set up the rain gutter filled with water, adding dirt and rocks on one end to simulate land. Bits of Styrofoam or other floating material can serve as boats.
2. The teacher will (TTW) move one end (the end opposite the "land") of the gutter up and down to simulate the movement of the earth's crust during an earthquake.
3. Students will observe what happens- waves form and move away from the earthquake zone.
4. Students can time how long it takes waves to reach land and how far away the crests of the wave are at both origination point and the point the waves make landfall.
5. The teacher may decide to have students work on ways to prevent the waves causing damage on land (ex. A seawall or artificial islands)
6. Have the students record their observations on the attached sheet.

Discussion Questions

1. How are tsunami waves similar to regular waves at the beach? How are they different?
2. What happens when the tsunami waves hit the land? What happens to the "boats" on the water?
3. What can people do to protect themselves during a tsunami?

Assessment

1. Students are able to describe the cause and effect of an earthquake and the resulting tsunami.
2. Students may be able to connect their knowledge to the community after researching recent tsunamis in the news.
3. Students are able to model new learning by completing "I used to think... but now I know..." statements.

Resources

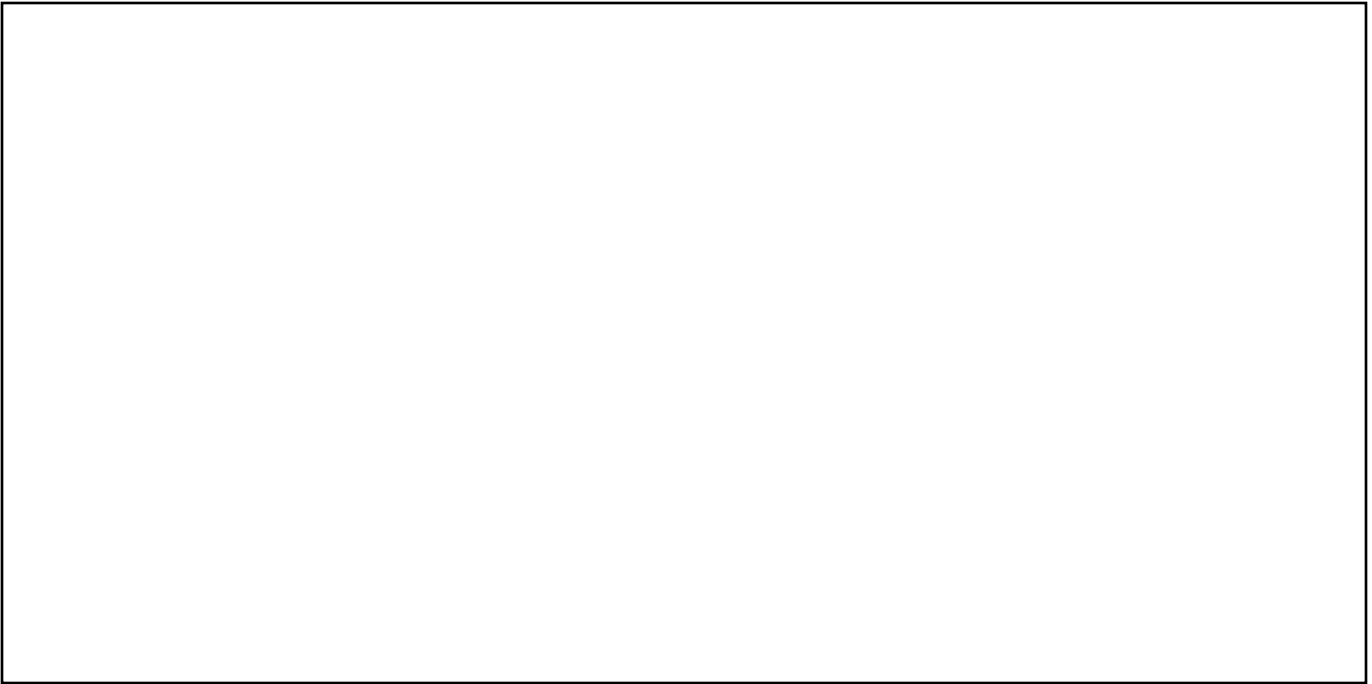
Wright, Ron. "A Wave of Interest." *Science and Children*, 2011. Print.

"Animated Guide: Tsunamis." BBC News. BBC, 2008. Web. 05 July 2016.
<<http://news.bbc.co.uk/2/hi/science/nature/7533972.stm>>

"Waves of Destruction: Tsunamis." PBS. Web. 05 July 2016.
<<http://www.pbs.org/wnet/savageearth/tsunami/index.html>>

Tsunami Observation Checklist

Draw the ocean floor where an earthquake starts a tsunami:



Before the "Earthquake"

- The water in the tray is: Flat _____ Bumpy _____
- The water at the end of the gutter near the shore is:

Clear _____ Mostly clear _____ Muddy _____

After the "Earthquake"

- There was: 1 wave _____ 2 waves _____ Many waves _____
- The water at the end of the gutter is:

Clear _____ Mostly clear _____ Muddy _____

What works best to stop the waves from coming on to the "land"?
