Tsunami – Teacher Demo Notes

Teacher Demonstration - The effect of seafloor movement and shallowing on the creation of a tsunami

Before tsunami

After (only tree remains upright)

Materials

- A large foil roasting or baking tray
- A sharp knife
- A large balloon, rubber glove or piece of flexible plastic
- A small rubber band
- A pebble or small object
- Sticky tape (gaffer tape is best)
- Water
- A sink, draining board or outside wet area (lawn)
- Sand
- Garnish options (plants, plastic houses etc.)

I placed a board under the tray to support it and partially withdrew it to gain access to the plastic below

Method - Part A

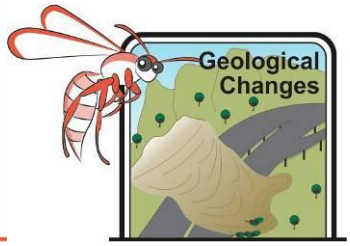
1. Place the stone at the centre of the flexible plastic sheet and secure it there with a rubber band.
2. Cut a hole in the base of one end of the baking tray (to the size of the pebble).
3. Stick the plastic covered stone on the bottom of the foil tray to tightly cover the hole.
4. Half fill the tray with water. This represents deep ocean.
5. Pull down on the enclosed pebble and release or quickly push up on the plastic. This represents ocean floor movement.
6. Observe

Results Part A

What did the movable plastic section represent? Underwater movement from an earthquake or the collapse of the magma chamber of a volcano.

What happened when the extended plastic was released? A large wave ran the length of the foil tray.

Tsunami – Teacher Demo Notes



Method - Part B

1. Place enough sand to one-third fill the end farthest from the flexible plastic. This represents shallowing to beach and land.
2. Mound the sand to represent a beach
3. Garnish with materials representing houses, vegetation and people.
4. Send the tsunami pulse again.

Results for part B

What happened to the tsunami wave when it approached the beach? The waves became higher and more destructive.
What happened to the sand on the beach? It was spread about smothering the animals. It flowed inland and then some of it flowed back into the sea.
What happened to the plants and animals? Most died from drowning or being knocked over.
How was the landscape changed? The land was flooded and flattened.

An animation of the creation of a tsunami can be found at:
http://www.pbs.org/wnet/savageearth/animations/tsunami/index.html
An explanation of the stages of a tsunami can be found at:
http://news.bbc.co.uk/2/hi/science/nature/7533972.stm

RESEARCH - Using the library or Internet.

What is a **TSUNAMI**? A destructive wave caused by movement of the sea bottom

What are the four main causes of a tsunami?

1. Earthquakes 75%
2. Volcanism 2%
3. Landslides 8%
4. Unknown 10% & Weather 2%

What effect will a tsunami have on low lying coastal land and on the plants and animals that live there? It will be swamped. Vegetation will be torn up and people and animals drowned unless they can move to higher ground.
What effect will a tsunami have on forests and farmland? Trees and crops will be flattened and the ground will be soaked with salt water which will make replanting impossible until rain washes it out of the soil.

EXTRAS FOR EXPERTS

You are a passenger on a boat sailing between Australia and Indonesia. You hear that there has been an earthquake and there might be a tsunami passing your boat in three minutes. Your surfboard is on deck. You decide to “ride the wave”. What will happen?
You might bob up and down as the low tsunami waves passes but you would not have a “wave” to ride unless you were near the shore where the wave builds up.