What Can Kesler Science Do for You?

4th - 8th grade science teachers love our Life, Earth, and Physical Science materials! With these easy and engaging materials, teachers can save planning time and put their focus back on the teaching that really matters.

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Two-week lessons with over 100 topics

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The Kesler Science Professional Learning Network (PLN) group on Facebook has a huge community of engaged and supportive science teachers - come join us!

KESLER SCIENCE

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Name: _____

Date: _____

The 9-day Rumble

Scientists are pretty good at tracking geological events these days. Remember that Tonga volcano explosion in the Pacific Ocean a few years ago? Geologists have an arsenal of satellites, seismic sensors, and other high-tech gear to monitor big changes in Earth's surface - sometimes as they happen in real-time!

It's rare that geologists get stumped anymore, yet that's exactly what happened in September 2023. Our planet was making a noise that the science community couldn't explain for a full year! Finally, experts are wrapping their heads around an unusual geological phenomenon.

If we traveled to the coastline of Greenland, we'd be astounded by the breathtaking landscape. Greenland has tons of fjords, which are narrow channels of sea water that have been carved out by glacier activity. If you were paddling along in a fjord, you would see towering mountains surrounding you on three sides.

Dickson Fjord is an isolated piece of geology on the Eastern coast of Greenland. That September, melting glaciers in the mountains around the fjord caused 25 million cubic meters of rock, dirt and ice to come crashing into the water in an epic avalanche. This landslide then caused a 650-foot-tall tsunami to come roaring to life.

The landslide registered a 4.1 on the Richter scale, getting the attention of scientists all over the world, but there was no sign of the short, intense waves that signal tectonic plate movement. This wasn't an earthquake.

Instead, the science community noticed a "monochromatic, very long period, seismic signal." In other words, they heard a low rumble that was not typical of shifting plates.

What's weird is that it kept going for nine days straight! What made this eerie rumble?

If you ever played in a bathtub as a kid, you might remember trying to create waves by sloshing your body back and forth across the tub (I definitely got in trouble a few times for flooding the floor with my wave pool experiments.) Well, a tub is a pretty good model for a fjord!

Fjords are like giant bathtubs because they're deep-water basins surrounded by tall walls. When the Greenland tsunami formed, it sent a tower of water heading to the other side of Dickson Fjord. Once the wave started to hit the far side of the fjord, it bounced back over itself.

This kept repeating back and forth between the walls, creating a special kind of standing wave called a seiche. It's called a standing wave because it looks like the water is rising and falling in the same spot over and over instead of moving forward.

The noise of the seiche is what the scientists heard, and the mostly enclosed fjord also amplified the movement of the water, which is probably what caused the weird seismic readings to last for such a long time. Once the water calmed down, the strange low rumbling stopped.

You don't need a tsunami to observe a seiche, by the way. They happen at the wave pool, in a bathtub, or in the kitchen sink all the time! Whenever waves coming from two directions meet to make the water look like it is just rising and falling instead of moving, you've got a standing wave.

Researching tsunamis got me thinking about sizes of waves. A 650-foot wave sounds terrifying, but actually isn't the largest ocean wave on the record books. Take a look at the graph on the next page.

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The 9-day Rumble

1. Look at the two largest tsunamis in recorded history. Do they have anything in common?

_____

_____

2. What is the height difference between the first and second tallest tsunamis presented on the graph?

_____

_____

3. A meter is a little more than 3 feet long. If the Greenland tsunami was 650 feet tall, how many meters would that be? Where would it rank on the chart?

_____

_____

_____

_____

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Fjords are like giant bathtubs because they're deep-water basins surrounded by tall walls. When the Greenland tsunami formed, it sent a tower of water heading to the other side of Dickson Fjord. Once the wave started to hit the far side of the fjord, it bounced back over itself.

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1. Look at the two largest tsunamis in recorded history. Do they have anything in common?

   The largest two tsunamis shown on the chart took place in Alaska.

2. What is the height difference between the first and second tallest tsunamis presented on the graph?

   The tsunami at Lituya Bay was 524 meters while the tsunami at Taan Fjord was 193 meters. 524 - 193 = 331 meters.

3. A meter is a little more than 3 feet long. If the Greenland tsunami was 650 feet tall, how many meters would that be? Where would it rank on the chart?

   The Greenland tsunami was about 217 feet tall (650/3). It would be the second tallest tsunami on the chart.

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