

SCIENCE ON A SPHERE

TSUNAMIS: WALLS OF WATER

Lesson #1: “Good Vibrations -- Waves All Around”

Students will learn that waves occur all around us in the physical world. We can see and surf water waves. There are many more waves that we can't see, but we can experience them in other ways. For example, our ears can hear sound waves and our skin can get tanned or burned by ultraviolet waves.

Standard 6: Nature of Matter and Energy

Benchmark 6.6.10: Explain how vibrations in materials set up wavelike disturbances that spread away from the source.

Benchmark 6.6.4: Describe and give examples of different types of energy waves.

Lesson #2 “Wild Water Waves”

In Lesson #1 students learned how vibrations cause waves to originate and spread throughout a medium. Students also gained a basic understanding of energy waves. In Lesson #2 students focus on water waves. They model different kinds of natural processes that produce vibrations, making waves in water. Students are introduced to the differences between wind-generated water waves and tsunamis.

Standard 6: Nature of Matter and Energy

Benchmark 6.6.10: Explain how vibrations in materials set up wavelike disturbances that spread away from the source.

Lesson #3: “Technology to the Rescue”

Students learned in Lesson #1 about waves in general and in Lesson #2 about water waves in particular, with special attention to the powerful nature of tsunamis. In Lesson #3 students learn that human tragedy associated with the 1946 tsunami made society realize a need to develop a tsunami warning system. This need led to technological developments: the modification of seismometers and tide gauges for use in tsunami prediction and the invention of an ocean buoy-tsunami system.

Standard 2: Nature of Science

Benchmark 6.2.2: Explain how the needs of society have influenced the development and use of technologies.

Museum visit: Science on a Sphere program

Students are, perhaps for the first time, “hit” by tsunamis’ various manifestations of power as well as seeing application of lessons #1-3.

Lesson #4: “Tsunamis are TITANIC!”

Lesson #4 takes place after visiting the Bishop Museum’s program, “Science on a Sphere, Tsunamis: Walls of Water.” The goal of Lesson #4 is to reinforce the experience students had at the Museum, emphasizing the large scale of tsunamis.

Standard 1: Scientific Investigation

Benchmark 6.1.2: Use appropriate tools, equipment, and techniques safely to collect, display, and analyze data.

Lesson #5: “Tsunami!”

What do scientists at the Pacific Tsunami Warning Center do if they think a tsunami is coming? In Lesson #5 students take the role of scientists at the PTWC in a mock tsunami drill. The lesson begins with an alert that an earthquake has happened somewhere in the Pacific Ocean. In this and two successive alerts students are given information to allow them to determine which kind of a Tsunami Information Bulletin to issue.

Standard 2: Nature of Science

Benchmark 6.2.1: Explain how technology has an impact on society and science.

Lesson #6: “Are YOU Ready?”

In Lesson #6 students learn safe responses for both locally generated and distant tsunamis. Each student creates a convenient-sized tsunami brochure, which can be Xeroxed for sharing with family members.

Standard 2: Nature of Science

Benchmark 6.2.1: Explain how technology has an impact on society and science.