

## Ancient Eruptions

Investigate the second largest volcanic eruption in human history



## Ancient Eruptions: The Greek Island of Thera

**Students travel to the Greek island of Thera to explore the site of the second- largest volcanic eruption in human history and learn about the fascinating civilization that thrived there before the eruption. Science topics covered include navigation, volcanism, plate tectonics, rocks and minerals, archaeology, and natural disasters. Featured STEM Professionals include:**

*Dr. Robert Ballard - resident of the Ocean Exploration Trust; Director of the Center for Ocean Exploration, Graduate School of Oceanography URI*

*Dr. Haraldur Sigurdsson - Emeritus Professor of Oceanography at the University of Rhode Island; Recipient of the Coke Medal of the Geological Society of London*

*Eric Martin - Electrical Engineer and ROV pilot; Monterey Bay Aquarium Research Institute*

- **Activity 1: Heading to Thera** - Learn how to use a compass and navigate through the Greek Islands.
- **Activity 2: Get Ready to Rumble!** - Design and build an erupting model volcano.
- **Activity 3: Layers of History** - Model rock and ash layers that were laid during the eruptions of Thera.
- **Activity 4: The Ups and Downs of Thera** - Design and build models to show how Thera changed over the past 3,700 years.
- **Activity 5: Uncovering History** - Analyze an ancient wall painting from Akrotiri and create a modern wall-painting
- **Activity 6: Are You Ready?** - Prepare for a volcanic eruption by identifying items to include in a preparation kit.

### Cross-Curricular Connections

#### Reading & Writing for Technical Subjects:

LST.1: Read and comprehend science and technical texts independently and proficiently and write effectively for a variety of discipline-specific tasks, purposes, and audiences

LST.2: Extract and construct meaning from science and technical texts using a variety of comprehension skills

LST.2.2: Determine the central ideas or conclusions of a text; provide an accurate, objective summary of the text.

LST.2.3: Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

LST.3.1: Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to texts and topics.

LST.4.1: Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

LST.7.1: Conduct short research assignments and tasks to answer a question (including a self-generated question), or test a hypothesis, drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

**Book Selections:** *Tools of Navigation: A Kid's Guide to the History and Science of Finding Your Way; Wilderness Navigation: Finding Your Way Using Map, Compass, Altimeter & GPS; Volcanoes and Earthquakes; Why Do Volcanoes Blow Their Tops? Fires in the Sea; Santorini: A Guide to the Island and Its Archaeological Treasures; Thera: Pompeii of the Ancient Aegean; The Wall-Paintings of Thera; Predicting Natural Disasters; Volcanologist*

**Math:** Algebraic Problem Solving, Triangulation, Circle Geometry & Degrees

**Social Studies:** Aegean Sea, Black Sea, Greek Islands, Tectonic Plates, Archaeology, Ancient Civilizations

**Art:** 3-dimensional design, Cave & Wall Paintings, Papier-Mache Models

## Grades K-3 Science Content Standards

- K-2.E.2** Develop a simple sketch, drawing, or physical model to illustrate and investigate how the shape of an object helps it function as needed to solve an identified problem. (Activities: 2, 3, 4)
- 1.ESS.2** Observe and compare properties of sand, clay, silt, and organic matter. Look for evidence of sand, clay, silt, and organic matter as components of soil samples. (Activities: 2, 3, 4)
- 1.ESS.3** Observe a variety of soil samples and describe in words and pictures the soil properties in terms of color, particle size and shape, texture, and recognizable living and nonliving items. (Activities: 3, 4)
- 2.PS.2** Predict the result of combining solids and liquids in pairs. Mix, observe, gather, record, and discuss evidence of whether the result may have different properties than the original materials. (Activity 2)

## Grades 4-5 Science Content Standards

- 4.ESS.3** Describe how geological forces change the shape of the land suddenly and over time. (Activities: 2, 3, 4)

## Grades 6-8 Science Content Standards

- 6-8.E.3** Analyze data from investigations to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. (Activity 2)
- 7.ESS.1** Identify and investigate the properties of minerals. Identify and classify a variety of rocks based on physical characteristics from their origin, and explain how they are related using the rock cycle. (i.e. Sedimentary, igneous, and metamorphic rocks) (Activities: 3, 4)
- 7.ESS.2** Construct a model or scale drawing (digitally or on paper), based on evidence from rock strata and fossil records, for how the geologic time scale is used to organize Earth's 4.6 billion-year-old history. (Activities: 3, 4, 5)
- 7.ESS.3** Using simulations or demonstrations, explain continental drift theory and how lithospheric (tectonic) plates have been and still are in constant motion resulting in the creation of landforms on the Earth's surface over time. (Activities: 2, 3)
- 7.ESS.5** Construct a model, diagram, or scale drawing of the interior layers of the Earth. Identify and compare the compositional (chemical) layers to the mechanical (physical) layers of the Earth's interior including magnetic properties. (Activities: 3, 4)