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Catastrophic Events [7th grade]

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Education Department

Understanding by Design Curriculum Units

Trinity University *Year* 2005

Catastrophic Events

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UNDERSTANDING BY DESIGN

Unit Cover Page

Unit Title: Catastrophic Events

Grade Level: 7

Subject/Topic Area(s): Science (Earth Science: Geology)

Designed By: Theodore Risinger

Time Frame:

School District: North East ISD

School: Barbara Bush Middle School
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Unit Summary:

This unit focuses on the study of earthquakes and volcanoes as a means for better understanding the dynamic Earth we live on; and the impact of catastrophic events on human life. The student should complete this unit with a greater understanding of Earth's dynamic nature, being able to scientifically explain the cause of earthquakes and volcanoes. Along with the science of volcanoes and earthquakes the student will appreciate the value of scientific study as it relates to the protection of human life and society. This unit is by no means an all inclusive look at all catastrophic events. The goal is an understanding of two types of catastrophic events that will enable the student to analyze other catastrophic, their scientific study and their impact on human life.

STAGE 1 – DESIRED RESULTS

Content Standard(s)

7.14 A Describe and predict the impact of different catastrophic events on the Earth
7.5 A Describe how systems may reach equilibrium such as when a volcano erupts

7.8 A Illustrate examples of potential and kinetic energy in everyday life
7.3 C Represent the natural world using models and identify their limitations
7.3 D Evaluate the impact of research on scientific thought, society, and the environment

Understanding(s) Students will understand that…

Catastrophic events are Earth's way of maintaining its equilibrium during change.
Our dynamic Earth cannot be controlled, accurate predicting is not possible.
The damages caused by catastrophic events are often wide spread, contributory, and often long-term.
By studying and understanding catastrophic events we can better protect human life.
Catastrophic events are the evidence that Earth is a dynamic system.

Essential Question(s)

Primary:
Are catastrophic events inevitable?
What can we do to make these events less catastrophic?
What makes a catastrophic event catastrophic?

Other Questions for Consideration
Can humans safeguard themselves against catastrophic events?
What can be done to make catastrophic events less catastrophic?
What value is there in studying and researching catastrophic events?

Students will know…	***Students will be able to:*** **K**
Earthquake and volcano terms and anatomy	*Explain how equilibrium is reached with the occurrence of catastrophic events.*
The forces responsible for volcanoes and earthquakes	*Identify & predict the effects of earthquakes and volcanoes.*
Earthquakes and Volcanoes are the product of tectonic plate movement.	*Construct a model of catastrophic events.*
Where various types of catastrophic events are likely to take place.	*Syntheses numeric and illustrated data to predict patterns and damage.*
How earthquakes and volcanoes are studied and measured.	*The connection between different catastrophic events.*

STAGE 2 – ASSESSMENT EVIDENCE

Performance Task: General Prediction, Bexar County T

(explain, interpret, apply, perspective)

It is 2020 and a in the past 15 years a volcano has formed outside of San Antonio, southeast of Fredericksburg, northeast of Boerne. Scientists have been aggressively monitoring the volcano since 2005 when the area began to experience low level yet consistent seismic activity. Recent data gathered suggests that an eruption is very near. You have been asked to to develop a 'General Prediction' for Bexar County. Because this volcano has no history, predicting the type of eruption is difficult. The data says an eruption is near, an increase in seismic activity, drastic ground deformation, and spiking gas levels. Your job is to forecast the possible damage to the city of San Antonio and surrounding areas. Because you do not know which type or eruption will take place you must take all types of eruptions into consideration.

The county has asked you to create a map of projected damages and hazards resulting from an eruption. You must present your map at a city counsel meeting to the Mayor (the Teacher)
Along with your map there also needs to be a list of predicted hazards/dangers to the environment and human life as well as suggestions for dealing with the problems.

Key Criteria:

See attached Rubrics **General Predictions Map** & **Presentation to Mayor**

Other Evidence:

- ✓ Students will compare two catastrophic events of similar magnitude that occurred in nations of different economic development and argue which was more catastrophic and why. (interpret & empathy)
- ✓ Students will write captions for photos showing the effects of catastrophic events. In the captions they must identify the type and magnitude of the catastrophic event. (Explain)
- ✓ Students will create a catastrophic events survival kit. (self knowledge & apply)
- ✓ Students will create a pair of textbook illustrations/figures or a poster showing the structure of volcanoes. (apply)
- ✓ Students will take a quiz on earthquake and volcano vocabulary & anatomy.

Stage 3 – Learning Plan
This schedule is deisgned for 45 min. classes & students seen daily

Day 1	Essential Question: Journal & Discussion Show Content Trailer
Day 2	The value of scientific study: present the USGS website. **Assignment**: Track Seismic Activity w/ USGS, one week.
Day 3	The Dynamic Earth: Evidence of Change, Plate Tectonics. Volcanoes and Earthquakes
Day4	All about Earthquakes: Structure, Types, Vocabulary, Tracking, Measuring
Day 5	All about Earthquakes Cont. **Assignment:** Textbook Illustrations: Earthquakes.
Day 6	All about Earthquakes Cont. **Assignment:** Caption writing for post quake photos
Day 7	Lab: Jell-O Earthquakes, build structures on Jell-O
Day 8	Video: The Day Earth Shook Compare two similar catastrophic events- Argue which was more Catastrophic & Why. **HW:** Research and make a list for an **Earthquake Survival Kit** for your family
Day 9	**Demo:** Eruption of an ammonium dichromate [(NH4)2Cr2O7] A classic chemistry volcano demonstration. All about Volcanoes: Structure, Anatomy, Vocabulary,
Day 10	All about Volcanoes Cont.: Eruptions, Effects, **Assignment:** Textbook Illustrations: Volcanoes
Day 11	All about Volcanoes Cont.: Methods of Prediction: General and Specific
Day 12	Earthquake & Volcano **Quiz:** Vocabulary and Anatomy Start Video Mount St. Helens
Day 13	**Video Cont.**: Mount St. Helens.
Day 14	**Present Performance Assessment**: General Prediction; Bexar County *Give a weekend to work outside of class.*
Day 15	Work Day
Day 16	Work Day
Day 17	City Council Meeting: Present General Predictions. (Shoot for a Monday or Tuesday)
Day 18	City Council Meeting Cont”

Refrences & Research

Blong, R. J. Volcanic Hazards: A Sourcebook on the Effects of Eruptions. Sydney: Macquarie University. 1984. (QE 522 B65)

Chester, David. Volcanoes & Society. London: Edward Arnlold. 1993. (QE 522 C46)

Crandell, D.R., Mullineaux, D.R. 1978. Potential Hazards from Future Eruptions of Mont St. Helens Volcano, Washington, United States Geological Survey Bulletin, 1383-C.

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McGuire, Bill. Monitoring Active volcanoes. London: UCI Press. 1995. (QE 522 M66)

Wood, Dr. Robert Muir. Earthquakes and Volcanoes. New York: Weidenfeld & Nicolson. 1987. (QE 521.2 W66)

Webcites

Unites States Geological Survey **http://www.usgs.gov/**
Volcano Eruption Demo: **http://chemistry.about.com/cs/demonstrations/a/aa033003a.htm**