Climate change Dec. Eruption of Pompeii and Effects on Climate Change

Content Area: **Social Studies**
Course(s): **Language Arts, Science**
Time Period: **February**
Length: **1 week**
Status: **Published**

Unit overview

About 2,000 years ago in Italy, a volcano named Mount Vesuvius erupted and completely destroyed the city of Pompeii, killing thousands of people. Eruptions of volcanic ash caused destruction to nearby lands and left behind hints of climate change. Scientists and Historians have since found evidence from different areas of the globe linking climate change to similar volcanic eruptions. Scientists and Historians use different pieces of evidence from the past and present to determine the significance of the eruption and it's short term and long term effects. Students will research the eruption of Pompeii and examine the evidence for climate change from that eruption. Students will examine the evidence of climate change from a more recent eruption and compare the affects that are made on the climate.

Enduring Understandings

Climate change can occur through drivers such as volcanic eruptions, plate movement, and geography. Natural disasters can play a key role in short term and long term climate change. Compare volcanic eruptions to that of historical eruptions for commonalities and differences.

Essential Questions

Compare and Contrast eruptions of the past to present-day eruptions and the effects they have on climate change.

How have ancient volcanic eruptions affected global climate change?

What evidence so scientists and historians use to understand the impact of climate change from ancient eruptions?

Instructional Strategies and Learning Activities

Day 1

Read "Lessons from Pompeii" in Reading Further in TCi.

Discuss the reading. Review Santorini eruption discussed in previous Greece Unit.

Distribute Compare and Contrast Graphic organizer and directions for final writing summary.

Day 2

Students examine types of evidence used by Historians and Scientists to show climate change from volcanic eruptions - Ice Core Sampling and Tree Rings - watch videos.

Students examine and research a current volcanic eruption. Use list of 5 worst eruptions if needed to direct students.

Students begin to fill out graphic organizer for Pompeii and choice eruption.

Day 3

Students continue to work on graphic organizers and continue their research/reading. Students should research their eruption specifically and fill out graphic organizer.

Day 4

Students continue to work on graphic organizers and continue their research/reading. Students should research their eruption specifically and fill out graphic organizer.

Day 5

Students will use their research and graphic organizers to write a summary of their findings. Students will determine what climate change factors may have occurred in the ancient world after the eruption of Pompeii based on their other findings.

Integration of Career Readiness, Life Literacies and Key Skills

9.2.8.CAP.1	Identify offerings such as high school and county career and technical school courses, apprenticeships, military programs, and dual enrollment courses that support career or occupational areas of interest.
9.4.8.CI.1	Assess data gathered on varying perspectives on causes of climate change (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).
9.1.2.CR.1	Recognize ways to volunteer in the classroom, school and community.
9.1.2.CR.2	List ways to give back, including making donations, volunteering, and starting a business.
9.4.8.CI.3	Examine challenges that may exist in the adoption of new ideas (e.g., 2.1.8.SSH, 6.1.8.CivicsPD.2).
9.4.8.CT.1	Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2).
9.4.8.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).

9.1.2.FP.2	Differentiate between financial wants and needs.
9.2.8.CAP.8	Compare education and training requirements, income potential, and primary duties of at least two jobs of interest.
9.4.8.CT.3	Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome.
9.4.8.DC.1	Analyze the resource citations in online materials for proper use.
9.4.8.DC.2	Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8).
9.4.8.DC.7	Collaborate within a digital community to create a digital artifact using strategies such as crowdsourcing or digital surveys.
9.4.8.GCA.2	Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.
9.4.8.IML.1	Critically curate multiple resources to assess the credibility of sources when searching for information.
9.4.8.IML.2	Identify specific examples of distortion, exaggeration, or misrepresentation of information.
9.4.8.IML.3	Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b).
9.4.8.IML.4	Ask insightful questions to organize different types of data and create meaningful visualizations.
9.4.8.IML.7	Use information from a variety of sources, contexts, disciplines, and cultures for a specific purpose (e.g., 1.2.8.C2a, 1.4.8.CR2a, 2.1.8.CHSS/IV.8.AI.1, W.5.8, 6.1.8.GeoSV.3.a, 6.1.8.CivicsDP.4.b, 7.1.NH. IPRET.8).
9.4.8.IML.8	Apply deliberate and thoughtful search strategies to access high-quality information on climate change (e.g., 1.1.8.C1b).
9.4.8.IML.9	Distinguish between ethical and unethical uses of information and media (e.g., 1.5.8.CR3b, 8.2.8.EC.2).
9.4.8.IML.10	Examine the consequences of the uses of media (e.g., RI.8.7).
9.4.8.IML.11	Predict the personal and community impact of online and social media activities.
9.4.8.IML.15	Explain ways that individuals may experience the same media message differently.
9.4.8.TL.2	Gather data and digitally represent information to communicate a real-world problem (e.g., MS-ESS3-4, 6.1.8.EconET.1, 6.1.8.CivicsPR.4).
9.4.8.TL.3	Select appropriate tools to organize and present information digitally.
9.4.8.TL.5	Compare the process and effectiveness of synchronous collaboration and asynchronous collaboration.
9.4.8.TL.6	Collaborate to develop and publish work that provides perspectives on a real-world problem.

Technology and Design Thinking

TECH.8.1.8	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

Interdisciplinary Connections

LA.RH.6-8	Reading History and Social Studies
LA.RH.6-8.1	Cite specific textual evidence to support analysis of primary and secondary sources.
LA.RH.6-8.3	Identify key steps in a text's description of a process related to history/social studies (e.g., how a bill becomes law, how interest rates are raised or lowered).
	Craft and Structure
LA.RH.6-8.4	Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.
LA.RH.6-8.5	Describe how a text presents information (e.g., sequentially, comparatively, causally).
LA.RH.6-8.6	Identify aspects of a text that reveal an author's point of view or purpose (e.g., loaded language, inclusion or avoidance of particular facts).
LA.RH.6-8.8	Distinguish among fact, opinion, and reasoned judgment in a text.
LA.RH.6-8.9	Analyze the relationship between a primary and secondary source on the same topic.
LA.RH.6-8.10	By the end of grade 8, read and comprehend history/social studies texts in the grades 6-8 text complexity band independently and proficiently.
LA.RI.7.1	Cite several pieces of textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferences drawn from the text.
LA.RI.7.2	Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.
LA.RI.7.3	Analyze the interactions between individuals, events, and ideas in a text (e.g., how ideas influence individuals or events, or how individuals influence ideas or events).
LA.WHST.6-8.1	Write arguments focused on discipline-specific content.
LA.W.7.1	Write arguments to support claims with clear reasons and relevant evidence.
LA.WHST.6-8.1.C	Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.
LA.WHST.6-8.1.D	Establish and maintain a formal/academic style, approach, and form.
LA.W.7.2	Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
LA.WHST.6-8.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
LA.WHST.6-8.2.A	Introduce a topic and organize ideas, concepts, and information using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia) when useful to aiding comprehension.
LA.WHST.6-8.2.B	Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.
LA.WHST.6-8.2.C	Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.
LA.WHST.6-8.2.D	Use precise language and domain-specific vocabulary to inform about or explain the topic.
LA.WHST.6-8.2.E	Establish and maintain a formal/academic style, approach, and form.
LA.W.7.7	Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.
LA.W.7.8	Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

LA.W.7.9	Draw evidence from literary or informational texts to support analysis, reflection, and research.
LA.SL.7.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.

Differentiation

- Understand that gifted students, just like all students, come to school to learn and be challenged.
- Pre-assess your students. Find out their areas of strength as well as those areas you may need to address before students move on.
- Consider grouping gifted students together for at least part of the school day.
- Plan for differentiation. Consider pre-assessments, extension activities, and compacting the curriculum.
- Use phrases like "You've shown you don't need more practice" or "You need more practice" instead of words like "qualify" or "eligible" when referring to extension work.
- Encourage high-ability students to take on challenges. Because they're often used to getting good grades, gifted students may be risk averse.

- **Definitions of Differentiation Components**:

    - Content – the specific information that is to be taught in the lesson/unit/course of instruction.
    - Process – how the student will acquire the content information.
    - Product – how the student will demonstrate understanding of the content.
    - Learning Environment – the environment where learning is taking place including physical location and/or student grouping

Differentiation occurring in this unit:

Modifications and Accommodations

Refer to QSAC EXCEL SMALL SPED ACCOMMOCATIONS spreadsheet in this discipline.

Modifications and Accommodations used in this unit:

Benchmark Assessments

Benchmark Assessments are given periodically (e.g., at the end of every quarter or as frequently as once per month) throughout a school year to establish baseline achievement data and measure progress toward a standard or set of academic standards and goals.

Schoolwide Benchmark assessments:

Aimsweb benchmarks 3X a year

Linkit Benchmarks 3X a year

Additional Benchmarks used in this unit:

Formative Assessments

Assessment allows both instructor and student to monitor progress towards achieving learning objectives, and can be approached in a variety of ways. **Formative assessment** refers to tools that identify misconceptions, struggles, and learning gaps along the way and assess how to close those gaps. It includes effective tools for helping to shape learning, and can even bolster students' abilities to take ownership of their learning when they understand that the goal is to improve learning, not apply final marks (Trumbull and Lash, 2013). It can include students assessing themselves, peers, or even the instructor, through writing, quizzes, conversation, and more. In short, formative assessment occurs throughout a class or course, and seeks to improve student achievement of learning objectives through approaches that can support specific student needs (Theal and Franklin, 2010, p. 151).

Formative Assessments used in this unit:

Summative Assessments

Summative assessments evaluate student learning, knowledge, proficiency, or success at the conclusion of an instructional period, like a unit, course, or program. Summative assessments are almost always formally graded and often heavily weighted (though they do not need to be). Summative assessment can be used to great effect in conjunction and alignment with formative assessment, and instructors can consider a variety of ways to combine these approaches.

Summative assessments for this unit:

Graphic Organizer

Written Summary of Findings

Instructional Materials

Watch video - National Ice Core Lab Stores Valuable Ancient Ice - Science Nation - to understand how ice core samples can help us understand climate change.

https://www.youtube.com/watch?v=JS2PhRd_5NA

Watch video - Tree rings aid study of climate change and weather conditions - to understand how tree rings

can reconstruct the climate of the past.

https://www.youtube.com/watch?v=5TsbFA_ONqc

Read NASA article - "Core Questions: An Introduction to Ice Cores"

https://climate.nasa.gov/news/2616/core-questions-an-introduction-to-ice-cores/

Watch video - Research 5 worst volcanic eruptions

https://www.youtube.com/watch?v=u-ha1K9jj9E

Read article - Top 5 Biggest Volcanic Eruptions

https://www.bbc.co.uk/newsround/16444327

Name _____/Period _____

Date _____/Pompeii Climate Change Research Graphic Organizer

Research and review information about the eruption at Thera (Santorini). Write your notes below:

The Eruption at Santorini:

Describe the eruption:

Date of eruption:

Where did this eruption take place?:

Predictions for climate change:

Research and review information about the eruption at Pompeii:

The Eruption at Pompeii:

Describe the eruption:

Date of eruption:

Where did this eruption take place?:

Predictions for climate change:

After watching the video “5 Worst Volcanic Eruptions”, take notes on the effects they had both short term and long term on the climate. Write at least 5 facts:

1.
2.
3.
4.
5.

Now choose another volcanic eruption and write the name on the following line:
_____

Describe the eruption:

Date of eruption:

Where did this eruption take place?:

Predictions for climate change:

Standards

LA.W.7.2	Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
LA.W.7.2.A	Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia).
LA.W.7.2.B	Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.
6.2.8.HistorySE.1.a	Explain how archaeological discoveries are used to develop and enhance understanding of life prior to written records.
6.2.8.GeoHE.2.a	Determine the extent to which geography influenced settlement, the development of trade networks, technological innovations, and the sustainability of early river valley civilizations.
6.2.8.HistoryCA.2.a	Analyze the factors that led to the rise and fall of various early river valley civilizations and determine whether there was a common pattern of growth and decline.
6.2.8.GeoPP.3.b	Explain how geography and the availability of natural resources led to both the development of classical civilizations and to their decline.
6.2.4	Expanding Exchanges and Encounters (500 CE–1450 CE) The physical and human characteristics of places and regions are connected to human identities and cultures.
6.2.8.GeoHE.4.b	Use geographic models to determine the impact of environmental modifications made by earlier civilizations on the current day environmental challenges.
6.3.8.CivicsPR.4	Use evidence and quantitative data to propose or defend a public policy related to climate change.