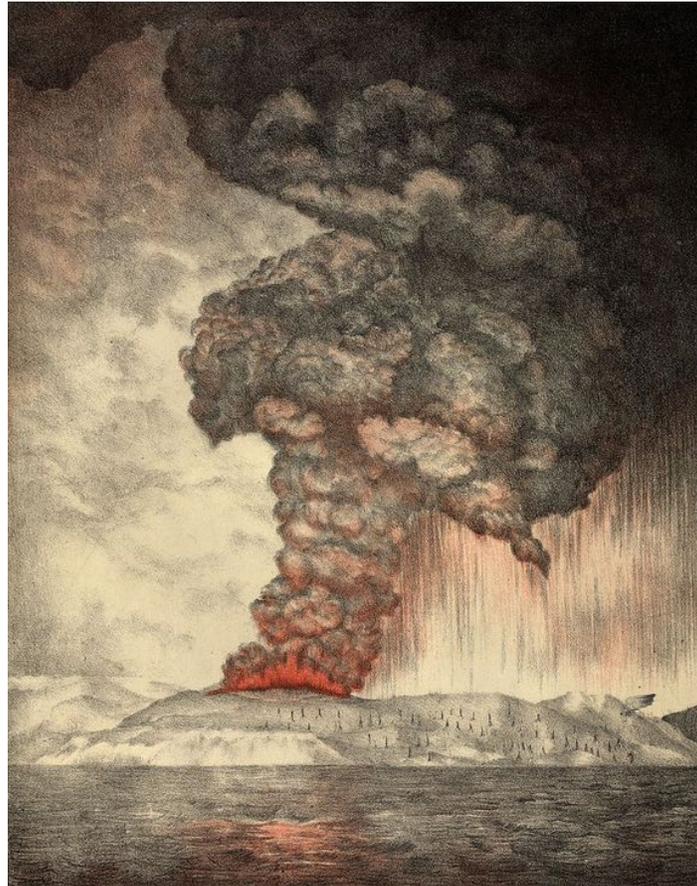


Due date: _____ (in class)

Large Volcanic Eruptions

Part A: Historically recent eruptions



An 1888 lithograph of the 1883 eruption of Krakatoa.
From “The Eruption of Krakatoa and Subsequent Phenomena,” published in 1888
<https://archive.org/details/eruptionkrakato00whipgoog>

In this activity, you will investigate one of three notable volcanic eruptions over the past 200 years: Pinatubo (1991), Krakatoa* (1883), and Tambora (1815). Bring two copies of your written summaries to class on the due date, one to turn in and one for you to use as a reference. If your last name begins with the letter A-H, you are assigned Mt. Pinatubo (1991); if your last name begins with the letter I-P, you are assigned Krakatoa (1883); and if your last name begins with the letters Q-Z, you are assigned Mt. Tambora (1815).

* a.k.a Krakatau

Learning Objectives: Students will

- Explain important climatic and societal features of a significant volcanic eruption.
- Develop an outline characterizing a significant volcanic eruption.
- Present their developed outline as a team to the class.

1. Video introduction. Go to

<http://podcast.open.ac.uk/oulearn/science/podcast-s269-earth-and-life> and watch the six short videos. Total viewing time is less than 20 minutes for all six. Enjoy!

- Volcanoes: Eruptions and climatic effects
- Volcanoes: How eruptions affect climate
- Volcanoes: Historic eruptions and climatic effects
- Volcanoes: Effects of magma eruptions
- Volcanoes: Flood basalt and its effects
- Volcanoes: Eruptions and mass extinctions

2. *Summary of assigned historical eruption*

Research your eruption event and summarize your findings (**A minimum of 250 word and 2 graphs or figures**). Be prepared to discuss your summary in class. Your summary should include:

- a. Basic information about the event including: date of the eruption, geographic location of the event, total eruption volume or mass.
- b. Atmospheric and climate impacts: a qualitative estimate of sulfur content, an estimate of its influence on global and regional temperatures (see data presented in units 1, 2, or 3)
- c. Societal impacts: impacts on local, regional, and/or global economy, changes in public policy, effects on human health and mortality.
- d. Finally, find an art piece that was inspired by the event: a painting, drawing, poem, book, movie, or musical composition.

Your research should include **at least four references**. With each reference briefly include a statement rating the value/quality of the resource and your rationale for your rating. Rating system of 1 to 5 is fine with 1 being the lowest value/quality and 5 being the highest.

You will team up with other students to create a master summary to share in class. Please see the rubric for this assignment on page 4.

Reference citation guidelines:

For journals or magazine articles references should include:

Author, publication date, title of article, journal name, volume, number, and page number.

For books the reference should include:

Author, title of book, chapter, page number(s), publisher with city, publication date

For websites the reference should include:

Title, author, affiliation, complete URL address, and retrieval date.

***Examples of scholarly journals**

(a good source of scholarly papers is <https://scholar.google.com/>. Also see **Appendix 1 for specific examples of scholarly publications for each eruption.**)

Nature
Science
Journal of Climate
Journal of Geophysical Research
Geophysical Research Letters
Earth and Planetary Science Letters
Geology
American Geophysical Union EOS
Bulletin of the American Meteorology Society

Rubric: Unit 6 (Volcanoes) Part A (20 points)

(created from <http://rubistar.4teachers.org/>)

CATEGORY	85 to 100%	70 to 85%	60 to 70%	0 to 60 %
Organization (2 pts)	Information is very organized with well-constructed paragraphs and subheadings.	Information is organized with well-constructed paragraphs.	Information is organized, but paragraphs are not well-constructed.	The information appears to be disorganized.
Amount of Information (3 pts)	All topics are addressed and all questions answered with at least 2 sentences about each.	All topics are addressed and most questions answered with at least 2 sentences about each.	All topics are addressed, and most questions answered with 1 sentence about each.	One or more topics were not addressed.
Quality of Information (5 pts)	Information clearly relates to the main topic. It includes several supporting details and/or examples.	Information clearly relates to the main topic. It provides 1-2 supporting details and/or examples.	Information clearly relates to the main topic. No details and/or examples are given.	Information has little or nothing to do with the main topic.
Diagrams or figure (at least 2 relevant figures) (4 pts)	Two relevant figures are presented and clearly discussed.	Two relevant figures are presented and discussed.	Two relevant figures are presented.	Figures are missing or have little to do with the topic.
Mechanics (3 pts)	No grammatical, spelling or punctuation errors. Achieved word count.	Almost no grammatical, spelling or punctuation errors. Achieved word count.	A few grammatical spelling, or punctuation errors. Less than stated word count.	Many grammatical, spelling, or punctuation errors. Less than stated word count.
Sources (at least 4 references) (3 pts)	All sources (information and graphics) are accurately documented in the desired format.	All sources (information and graphics) are accurately documented, but a few are not in the desired format.	All sources (information and graphics) are accurately documented, but many are not in the desired format.	Some sources are not accurately documented.

Appendix 1. Examples of scholarly publications for each eruption

Pinatubo

Atmospheric effects of the Mt. Pinatubo eruption. MP McCormick, LW Thomason, CR Trepte - Nature, Vol. 373, 2 Feb 1995. Available at:

<http://www.nuclear.lu.se/fileadmin/nuclear/Undervisning/Atmosfaerskurs/P04.pdf>

Summary of Pinatubo from Global Volcanism Program of the Smithsonian. See:

<http://volcano.si.edu/volcano.cfm?vn=273083>

Krakatoa

Volcanoes and climate: Krakatoa's signature persists in the ocean. P. J. Gleckler¹, T. M. L. Wigley², B. D. Santer¹, J. M. Gregory^{3, 4}, K. AchutaRao¹ & K. E. Taylor¹. Nature 439, 675 (9 February 2006) Available at: <http://www.nature.com/nature/journal/v439/n7077/full/439675a.html>

Summary of Krakatoa from Global Volcanism Program of the Smithsonian. See:

<http://volcano.si.edu/volcano.cfm?vn=262000>

Tambora

The great Tambora Eruption and its aftermath, Richard B Stothers. Science, June 15 1984, Vol 224, No. 4654, 1191-1198. Available at: http://pubs.giss.nasa.gov/docs/1984/1984_Stothers_2.pdf

Summary of Tambora from Global Volcanism Program of the Smithsonian. See:

<http://volcano.si.edu/volcano.cfm?vn=264040>