Nineteenth-Century Newspaper Accounts of an Eruption at Mount Rainier

Grade Level: 5+

Learner Objectives:

Students will:

- Recognize that eruptive activity at Mount Rainier occurred as recently as the end of the nineteenth century
- Understand that not all volcanic activity at Mount Rainier is large or destructive
- Recognize that the number of eruptions at Mount Rainier exceeds the number of eruptions we know about because not all eruptions leave long-lasting physical evidence

Setting: Classroom

Timeframe: 30 minutes; 20 minutes plus interviewing and writing time

"Reading about Nineteenth Century Volcanic Activity at Mount Rainier"

"Getting the Scoop"

Materials:

- Graphic of ***"Steam Activity at Mount Rainier as Viewed from Seattle, Washington, during late Nineteenth Century"***

USGS science for a changing world

Living with a Volcano in Your Backyard-An Educator's Guide with Emphasis on Mount Rainier

Prepared in collaboration with the National Park Service

U.S. Department of the Interior
U.S. Geological Survey

General Information Publication 19

Overview

Nineteenth–century newspaper accounts report recent eruptions at Mount Rainier. The minor eruptive activity at Mount Rainier illustrates not all eruptions are large or destructive.

Teacher Background

Mount Rainier Erupted as Recently as the Nineteenth Century

Mount Rainier erupted on at least two occasions during the nineteenth century. Around 1850, small amounts of fresh ***magma*** erupted from the summit crater. The erupting magma fell as shattered fragments of hot rock known as ***tephra***, or ***volcanic ash.*** Snow buried the volcanic ash, and then glaciers distorted and transported the ash layers away. Geologists find only a thin, discontinuous layer of ash remaining as evidence of this ***eruption.*** During 1894-95, steam blasted small pieces of rock into the air, which deposited an even sparser layer of ash on the surface of the volcano. These eruptions were small but were well observed and reported by eyewitnesses in the pioneering cities of Seattle and Tacoma. In many ways, their reports are akin to those that might be written if Mount Rainier were viewed today during an eruption.

Eyewitnesses Observed and Reported Eruptions During 1894-95

In the winter of 1894-95, many residents of Seattle saw explosions of steam and "black smoke" erupting from the summit of Mount Rainier. Steam and ash billowed above the summit in pulses a fraction of a minute apart. According to reports, black smoke (accepted today as volcanic ash)

- Copies of ***"Nineteenth-Century Newspaper Accounts"*** student page
- Copy of ***"Nineteenth-Century Newspaper Accounts"*** teacher discussion questions
- Copies of ***"Getting the Scoop"*** student page

Vocabulary: Ash cloud, earthquake, eruption, lava, magma, tephra, volcanic ash

Skills: Data collection, interviewing, reading, reporting synthesis

Benchmarks:

History:

1 – The student examines and understands major ideas, eras, themes, developments, turning points, chronology, and cause-effect relationships in United States, world, and Washington State history

Communications:

1 – The student uses listening and observation skills to gain understanding.

1.1 – Focus attention

- Give evidence of paying attention, such as nodding, maintaining eye contact, taking notes and asking relevant questions

1.2 – Listen and observe to gain and interpret information

- Listen for, identify and explain portant as well as etraneous details

1.3 – Check for understanding by asking by asking questions and paraphrasing

- Ask questions to clarify content and meaning
- Paraphrase conversation and information

was hurled into the air, where it remained suspended until it was carried away by the wind. Most witnesses were Seattle residents who reported the eruption came from Columbia Crest, the summit of Mount Rainier. A smaller number of Tacoma residents were able to view the eruption, because Columbia Crest was obscured by summit terrain to the west. One newspaper office sponsored an exploratory expedition to Mount Rainier's slopes. Many observers noted slight changes to the mountain's profile (probably caused by darkening of the snow pack). They also sensed an increase in ***earthquakes,*** avalanches, and rockfalls on the slopes of the mountain.

Pioneering newspaper accounts support the thesis that Mount Rainier is an ACTIVE volcano

For years after the 1894-95 events, scholars who thought the reports were a mere figment of overactive imaginations or yellow journalism, downplayed reports of this eruption. Scientists today recognize that many small eruptions may not leave long-lasting physical evidence, and accept these newspaper reports as true. The reports support an understanding that Mount Rainier is an active volcano with the ability to transform itself on a small and large scale. Past events prove the mountain's ability to reheat, cause minor changes to the terrain, then return to a state of slumber without grand pyrotechnic displays of ***lava*** and towering ***ash clouds.*** These news reports, first published in pioneering newspapers, make for interesting reading. They are fully reproduced by permission in this guide. A variety of accounts also refer to additional volcanic activity around 1870, though little detail is known of those events.

Procedure

Reading About Nineteeth-Century Volcanic Activity at Mount Rainier

Write a journal entry about a volcanic eruption to assess knowledge of volcanic processes and terms.

1. Introduce this activity by initiating discussion using information from the ***"Chapter 1 Background"*** in this guide about different types of volcanoes and styles of eruptions. Small events can lead to larger scale volcanic activity, intermittent activity, or a sudden return to slumber. Display the graphic ***"Steam Activity at Mount Rainier as Viewed from Seattle, Washington, during late Nineteenth-Century"*** during your discussion.

2. Provide each student with a ***"Nineteenth Century Newspaper Accounts"*** student page.

3. Instruct students to read the passages below as though they were observers one hundred years ago. Then, ask them how their descriptions of these events might be similar or different today.

4. Describe the history behind the newspaper articles as explained in the teacher background.

5. Use the ***"Nineteenth Century Newspaper Accounts"*** teacher discussion questions to discuss the articles as a class.

Getting the Scoop

Practice writing a newspaper article on a geologic event in the Pacific Northwest by interviewing an adult who witnessed it.

1. Discuss some recent geologic events (volcanic eruptions, earthquakes, lahars, ash falls, floods, etc.) that have taken place in the Pacific Northwest during the students', parents' and grandparents' lifetimes. If needed, refer to the **Cascade Volcano Timeline** activity.

2. For homework, ask students to prepare a list of 5-10 questions on the ***"Getting the Scoop"*** student page to use to interview an adult about a geologic event. Questions should include who, what, where, when, why, and how.

3. Instruct students to interview an adult about a geologic event in the Pacific Northwest that the person remembers or witnessed. Students should use the questions they prepared and write answers on the student page.

4. Ask students to write a newspaper article (2-3 paragraphs long) to "report" the geologic event.

5. Compile all the student articles and share them with the class.

Adaptations

- Using ***"Getting the Scoop,"*** ask students to check their witnesses' stories with published articles about the geologic events. Did the witness remember the event correctly? Did they remember all the important details?

Extensions

- Instruct students to conduct an Internet or library search on different types of volcanoes (shield, cinder cone, stratovolcano or composite) and volcanic eruptions (Plinian, Strombolian, Hawaiian, etc.). How are they different?
- Instruct students to perform an Internet or library search on current natural hazards or volcanic activity in the world. Advise students to follow the course of volcanic activity at one of Earth's more frequently active volcanoes, such as Arenal, Colima, Etna, Kilauea, Mayon, Merapi, Oshima, Poas, Pacaya, Pavlov, Popocatepetl, Ruapehu, Sakura-Jima, San Cristobal, Santa Maria (Santiaguito), Spurr, St. Helens and Unzen. Students assemble a chronology of events that took place over a period of weeks, months or years. They write report about the activity that took place and predict what volcanic activity people living near the volcano can expect in the future. Was volcanic activity spectacular and destructive at all volcanoes?

Assessment

Use results of the teacher discussion questions to assess students' recognition of the recentness of eruptive activity at Mount Rainier; about how eruptions can be so small as to be disputable; that not all eruptions leave long-lasting physical evidence. Assess students' ability to think on a global scale by review of their results on student page ***"Getting the Scoop."*** Do their interview questions glean information based on observations? Do students recognize that observations can be disputable? How well have they applied information learned in this activity to a real-world situation?

References

Harris, S.L., 2004, Fire Mountains of the West: The Cascade and Mono Lake volcanoes. Mountain Press Publishing Company, 3rd edition, 454 p.

Harry Majors, 1981: Mount Rainier- the Tephra Eruption of 1894, Northwest Discovery, Seattle, WA., volume 2, number 6, p. 334-381.

Refer to **Internet Resources Page** for a list of resources available as a supplement to this activity.

Credits

Drawing ***"Native American Views Mount Rainier and a Lahar Spreading over the Valley Floor"*** by Linda Feltner, Seattle, Washington, used with permission.

News accounts were assembled by Harry Majors and used here with permission from their source, Seattle Post-Intelligencer.

Steam Activity at Mount Rainier as Viewed from Seattle, Washington, during Late-Nineteenth Century

Drawing by Linda Feltner, Seattle, Washington, used with permission.

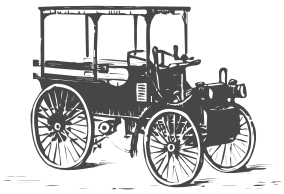
Student Page

Nineteenth-Century Newspaper Accounts

Background: *Experts largely disbelieved reports of an 1894 eruption at Mount Rainier until the 1981 discovery and reprinting of these early newspaper accounts.*

Instructions: *Read the 1894-95 newspaper accounts on steam eruptions at Mount Rainier. Discuss the newspaper accounts with your class. Are the eyewitness accounts of an eruption consistent? Do you find the eyewitness accounts believable?*

Eye-Witness News

ERUPTION OF MOUNT RAINIER	STEAM AND SMOKE PUFFS SEEN	BLACK SMOKE A RISING	NO GROUND FOR DENIAL
(few minutes past 6 a.m., from Seattle) Mrs. S.B. Selmes…is another witness of the eruption of Mount Rainier….. on the morning of Nov. 21 at a few minutes past 6 o'clock Mrs. Selmes happened to look out of the south window and was immediately attracted by the strange sight on the mountain. For over a half hour she watched it, and called her daughter's attention to it. She had never seen the mountain clearer, and there were no clouds near, save a low cloud to the left (to the east). At intervals of every few seconds a huge volume of smoke, quite dark in the center, shot up from the west rim of the crater, and then would die down again. The smoke looked like that from a stack of a large steamer. Mrs. Selmes is quite positive about the phenomenon, and related the particulars to her son-in-law, Rev. Garrett…soon after the event. (Post – Intelligencer, Dec. 2, 1894, p. 8)	Frank Johnson [sic], driver of the patrol wagon, viewed the sight through a small glass and said: "I saw steam and smoke puffing out of the mountain and rolling down on the eastern side of the mountain. The smoke rose like big balloons at regular intervals. All the snow appeared to have melted off, and the jagged ends of the rock stuck up. I saw a peak this side and in the center of the mountain, that I never saw before. It was 6:45 a.m. when I first saw it. Many others also saw it at the same time. It got hazy after 8 o' clock and I could see nothing more." (Press Times, Nov. 21, p. 1) 	(few minutes past 6 a.m., from Seattle. When I looked I saw a vast amount of black smoke arising from the southwestern part of the peak, where the crater is located [sic]. Great puffs of this smoke would come up at regular intervals of about fifteen seconds, and rise to a height of what appeared to be about 100 feet and then drift away to the eastward in jagged, irregular form. It would then seem to curve downward and encircle the mountain and, catching another current of air, would pass to the eastward and back of the mountain. These puffs of smoke reminded men of a slowly beating pulse. They would rise in conical form and at their greatest height would remain stationary a moment before drifting away." (Press-Times, Nov. 21, p. 1)	[probably morning, from Seattle] A great many people discredit the story of the phenomenon, but all who saw it declare that there is no ground for denying that they saw smoke in great quantities coming out of the mountain. It was not vapor, but dense, black smoke, which caused an old Pennsylvania man to say that it reminded him of a conflagration in an oil works he had on three different occasions seen. The smoke would come up from the top of the mountain in great puffs and then remain stationary a moment until a current of air would carry it away. (Post-Intelligencer, Nov. 23, p. 8)

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Student Page

Nineteenth-Century Newspaper Accounts continued...

Eye-Witness News

1894 - 1895 *Page 2*

HIS CROWN IS BROKEN

His crown is broken. Weird disturbances at the summit of Mt. Rainier. He belches smoke and steam. A new or transformed peak appears in place of the old one. Strange phenomena on the old mountain greets early risers. Sceptical [sic] Tacoma is convinced by earthquakes…. A dispatch sent from this city [Seattle] yesterday to Tacoma announcing the phenomenon was at once treated with ridicule, as the Tacomans, being on the west side of the mountain, had that portion of the crater which had caved in hidden from their view, and consequently would not credit what could be seen from the north only. A series of earthquake shocks last evening [November 21], however, shook their incredulity as well as their houses, and aroused them to the truth.. o the front several persons who also saw the smoke rising over the mountain…(The Seattle Post-Intelligencer, November 22, 1894, p. 8, cols. 1-3).

NO EARTHQUAKE FELT

…Mr Sarvin, who is employed in Colonel Plummer's engineering department, and who has been…all over the mountain, viewed the mountain yesterday [November 21] through his [field] glasses… and declared positively that there had been no change in the appearance of the mountain. When seen today [Nov.22] he was positive that there had been no eruption of any kind. He laughed at the report and expressed doubt that there could have been any disturbance in the mountain which could be seen only from Seattle... Mount Tacoma was obscured today [November 22] by clouds except for a very brief period, shortly before noon. At that time Col. Plummer, who is constantly keeping an eye on the mountain, succeeded in catching a glimpse of it through his glasses…. "I am not a good witness this time, because I did not feel the earthquake last night nor have I seen any evidences of any volcanic disturbances on the mountain. However, I am not ready to declare that those people who say they saw some evidences of an eruption or believe that they saw such, are mistaken. Because 100 persons say they did not see a certain thing, it does not follow that because one lone man says he did see it that he is lying."(Tacoma Daily News, November 22, 1894, p. 1, col. 2)

ERUPTION DISCREDITED

(few minutes past 6 a.m., from Van Trum[p] ….one of the first to make the ascent of the mountain, is among those who discredit the statement that any eruption, however slight, or any change in the form of the summit has occurred…. He has made a special study of the phenomena connected with the great mountain. Prof. Van Trump writes thus: … "It is worthy of note that the veteran mountain climber, Major Ingraham, when interviewed by the Post-Intelligencer, gave no credence to the alleged eruption. I confidently venture the prediction that when the clouds pass away and the fanciful mist clears away from the minds of the mountain observers at Seattle, and their imitators at Tacoma, they will see the mountain exactly as of yore and as they will continue to see it in their brief future. Every mountaineer who has become familiar with the mountain and its kaleidoscope phases, who have frequently climbed and studied its crater, can not fail to have become impressed by the idea of its immutability. To him it is ever a sublime type of unchangeableness, as far as anything purely mundane can be a type of the unchangeable."
(The Seattle Telegraph, November 24, 1894, p. 3, cols. 1-3.)

ERUPTION QUESTIONED

[…The fact seems to be that those who saw the mountain on the morning of November 21 saw the changes in it, and those who did not see it then did not see the changes and have not since been able to find them. The situation on this subject is well summed up in the San Francisco Examiner by Ambrose [Gwinett] Bierce [1842-1914, a western author, satirist, and columnist for the San Francisco Examiner] in the following manner: Question: Resolved, That during the lives of men still living Mount Rainier has been in visible eruption.

Affirmative—Prof. George Davidson, United States Geodetic Survey.

Negative—Dr. William C. Bartlett of the [San Francisco] Bulletin.

Evidence for the affirmative—Prof. Davidson has seen it in eruption.

Evidence for the negative—Dr. Bartlett has not seen it in eruption.

Decision (by the Bulletin): "The preponderance of testimony is in favor of non-eruption." (The Seattle-Post Intelligencer, December 1, 1894, p. 4, col. 4.)

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Teacher Page

Nineteenth-Century Newspaper Accounts

Teacher Discussion Questions

1. What evidence in the newspaper articles suggests a volcanic eruption was in progress?
   Pulsing jets of steam and ash, dark column of ash rising into the air, snowmelt, possible temporary deposition of volcanic ash, snowmelt revealed rocks not seen before.

2. Are the reports consistent? Do you find them believable?
   Some aspects of the reports are consistent. Observers close to one another made reports with greater consistency than observers geographically separated.

3. What could be done (or may have been done) to verify that an eruption had occurred?
   An expedition was sent to Mount Rainier to verify that an eruption had occurred. The group did not reach the summit, but viewed eruptions of steam and hot water. Ash deposited on the surface would provide additional verification of an eruption. Modern day instruments could quantify the amount of change to the surface.

4. If a small eruption did occur, why might evidence for it no longer exist?
   A fresh layer of volcanic ash may be thin and indistinguishable from dust, buried by snowfall, slowly carried away by moving glaciers, blown away by wind, washed away by rain, and obscured by soil and vegetation.

5. What does the occurrence of these small events suggest about the actual number of eruptions we know about?
   Evidence for small eruptive events is not always preserved over geologic time, and so the actual number of eruptions almost always exceeds the number for which we have evidence.

6. What do these newspaper reports tell us about the sizes of eruptions possible at Mount Rainier?
   Eruptions at Mount Rainier can be small, difficult to identify and uneventful as well as large, highly visible and destructive.

Student Page

Name _____

Getting the Scoop

Instructions: *Develop a list of 5-10 questions for an interview with an adult about a geologic event in the Pacific Northwest that he or she has witnessed or remembers. Interview your subject and record their responses on this page. Use this information to write a newspaper article about the event.*