

GED Lesson: How Did That Happen?
Cause and Effect
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GED 2002 Lesson Plans - Script

Area/Skill	Cognitive Skill Level	Correlation to Framework	Lesson Number
Science, Social Studies How did that happen? Cause and effect, reasoning skills	Analysis, knowledge and comprehension	(Florida only)	

Activity Title: How did that happen? Cause and Effect

This is designed for a single class session.

Introduction

Group Activity: Begin with everyday examples of cause and effect. Start with a simple example, such as if I forget to pay my rent then I have to pay a late fee. Then give an example with more possible effects, such as, if I eat dinner at McDonalds everyday for a month, what do you think the result will be? Students may brainstorm that I gain weight, overspend my budget, have free time to watch a ball game because I'm not cooking, etc. Then have students make up their own cause and effect examples. After working with everyday examples, have students apply this thinking skill to more complex information. I chose a science event, the eruption of Mt. St. Helens. As with all lessons, previewing what a volcano is and listing what students already know about the subject is the done before the reading. Also, locate Oregon and then Mt. St. Helens on a US map.

(My students are very interested in nature and that is why I chose this topic.)

Main Activity

The main activity involves students searching online for articles on Mt. St. Helens, reading them and allowing students to compare notes on Mt. St. Helens' explosion of May 1980. If a classroom isn't Internet connected, then a teacher can use the attached articles. Then have the students develop cause and effect examples based on the information in the article. Students could answer the questions: What caused the eruption? What changed because of the eruption? What was destroyed because of the eruption? How has the area changed due to the explosion?

Extensions to the activity include developing a time line of events and their causes and effects. Another extension is to compare the explosion of Mt. St. Helens to Mt. Vesuvius. Also, students learning map reading skills could locate other volcanoes around the world.

Closure/Conclusion

To conclude the lesson, have the students brainstorm natural events in their own environment, such as the Johnstown Flood, tornadoes, etc. Students can also brainstorm environmental causes and effects, such as what happens when there are large numbers of deer, what happens to trout in the streams and acid rain increases...acid rain is caused by certain industries.

Teachers can emphasize thinking skills in any of the subject areas.

Follow-up Lessons/Activities

I would follow-up with cause and effect activities related to news stories and events.

<p><u>Activity Title</u> How did that happen? Cause and Effect.</p> <p><u>Goal/Objective</u> Teach students to think in terms of cause and effect and learn to apply that skill to reading and information related to science.</p> <p><u>Lesson Outline</u></p> <p><u>Introduction</u> Group Activity: Begin with everyday examples of cause and effect. Start with a simple example, such as if I forget to pay my rent then I have to pay a late fee. Then give an example with more possible effects, such as, if I eat dinner at McDonalds everyday for a month, what do you think the result will be? Students may brainstorm that I gain weight, overspend my budget, have free time to watch a ball game because I'm not cooking, etc. Then have students make up their own cause and effect examples. After working with everyday examples, have students apply this thinking skill to more complex information. I chose a science event, the eruption of Mt. St. Helens. As with all lessons, previewing what a volcano is and listing what students already know about the subject is the done before the reading. Also, locate Oregon and then Mt. St. Helens on a US map.</p> <p><u>Activity</u> The main activity involves students searching online for articles on Mt. St. Helens, reading them and allowing students to compare notes on Mt. St. Helens' explosion of May 1980. If a classroom isn't Internet connected, then a teacher can use the attached articles. Then have the students develop cause and effect examples based on the information in the article. Students could answer the questions: What caused the eruption? What changed because of the eruption? What was destroyed because of the eruption? How has the area changed due to the explosion?</p> <p><u>Real-Life Connection</u> Connect the skills to a current event. The real-life connection is to think in terms of cause and effect. When students work on goal setting, planning, and analyzing what works or doesn't work for them, cause and effect is a fundamental thinking skill. Teachers can encourage students to use the skill and attach the skill to looking at pro and cons and decision-making.</p>	<p><u>Materials/Texts/Realia/Handouts</u></p> <p>News and information Cause and Effect Chart Internet access Calculators for math problems</p> <p><u>Extension Activity</u> Math problems related to the reading content. Math problems: distance, measurement and area.</p> <p>Extensions to the activity include developing a time line of events and their causes and effects. Another extension is to compare the explosion of Mt. St. Helens to Mt. Vesuvius. Also, students learning map reading skills could locate other volcanoes around the world.</p> <p>Follow-up with cause and effect activities related to news stories and events.</p> <p><u>ESE Accommodations</u></p>
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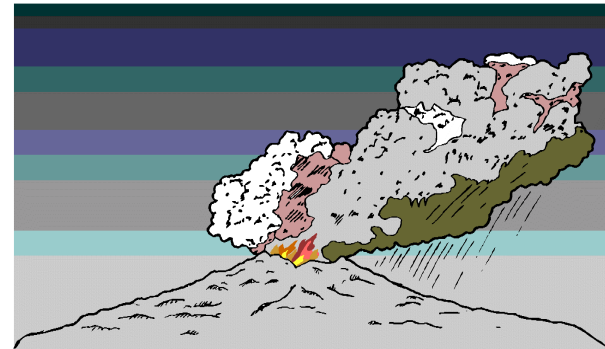
Mount Saint Helens

Through a Times article and doing a simulation on the computer on the actual event, our class got a taste for what really happened on Sunday, May 18, 1980: the eruption of Mount Saint Helens.

Some Facts:

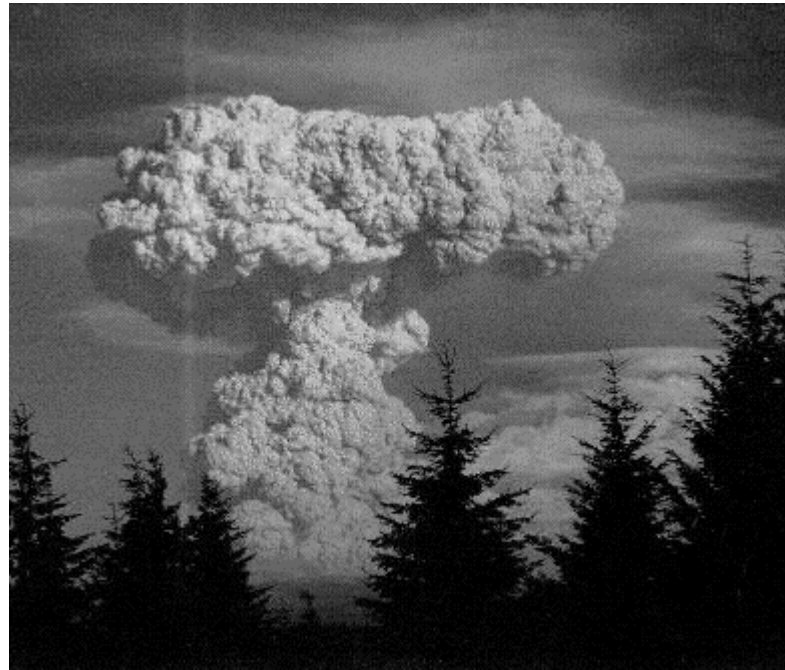
- The explosion was 500 times the punch of the atomic bomb dropped on Hiroshima.
- It "blew its top off". 1300 feet, that is.
- The first eruption (a minor one) was felt on March 27, 1980.
- Within a week, 18 people died and 71 were missing. In total, 75 died.
- Yakima, a town 85 miles east of the eruption, experienced "midnight at noon" due to the ash.
- President Carter declared the scene a federal disaster area.
- Rocks were found in Montana, 400 miles away.
- Housewives were told to use only detergents when washing clothes (soap might mix with the water and form sludge, clogging the wash machines).
- The eruption could be seen from 30 miles away.
- Trees worth at least \$1 billion were flattened.
- Crops within 3 miles of the crater were destroyed.
- 8 tons of ash per acre fell in the area of Idaho.
- Ritzville, Washington had 5 inches of dust dumped on it and 2-5 foot drifts.
- On the east coast, there were bits of the ash cloud that was carried by the wind and reddish sunsets due to the dust.
- According to one starving businessman, ash cost 50 cents a gallon.

Source: <http://www.hcrhs.hunterdon.k12.nj.us/science/helen.html>

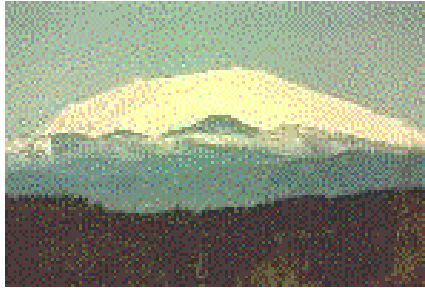


Mt. St. Helens - June 1980

A [VanNatta](#) Photo



After the initial explosion of Mt. St. Helens in May of 1980, there were several events that followed. This previously unpublished photo was taken by Robert P. VanNatta of a secondary eruption some days after the "big one". It was taken from the VanNatta Tree Farm in Central Columbia County, Oregon looking northeast with a telephoto lens.



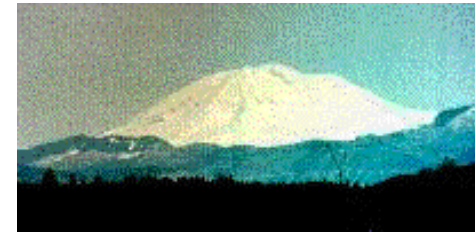
Mt. St. Helens Today

[The USGS/Cascades Volcano Observatory](#) includes much official information about Mt. St. Helens and other Cascades volcanos. This writer lived about 50 miles south of Mt. St. Helens but in a location where under appropriate visibility conditions she dominated the northern skyline. Before its eruption Mt. St. Helens was a very beautiful mountain of an almost perfect conical shape with a rounded top. It was often compared to Mt. Fuji for its beauty and poise. I have applied the 'she' reference in referring to her because that is consistent with the Indian legends of the area who characterized Mt. St. Helens as a beautiful but temperamental woman. Mt. St. Helens has been one of the most active volcanos in the Pacific Northwest, but apparently often burped in conjunction with some of the other volcanos in the area which include Mt. Hood, and Mt. Adams. Before the 1980 event, Mt. St Helens has last been active between 1800 and 1857 when she erupted a number of times and likely provided the factual basis for the legends.

Mt. St. Helens was easily climbed before her eruption by 'walk up' parties because of its relatively gentle slopes. But alas, the steam explosion of 1980 blew away around a cubic mile of this beautiful lady and left a crater of enormous proportions, and she is photogenic no more.

See also the [Mt. St. Helens National Monument](#) see [Volcano World](#).. However the Michigan Technological University has the most comprehensive set of [Volcano Links](#), however, the best collection of photos is found on the [Cascade Mountain Volcanos](#) page.

For some images see [Washington Volcano Images](#).. All of the photos showing on this page are taken from the From Northwest Oregon. The 'two icecream cone' view is one that is not readily visible from Washington State, and many in the greater Seattle area which is much closer to Mt. Rainier to not realize that Mt. Rainier is a twin peak mountain, or perhaps more accurately a much larger mountain with the center blown out of it. All three of the lower photos on this page were taken from the same vantage point in Columbia County Oregon with very strong telephoto camera equipment.



Mount Adams



Mount Rainier

Mount St. Helens 20 years Later



A panoramic view of the North side of Mt. Helens as seen from Johnson's Ridge in August 2000.

In March of 1980, Mt. St. Helens sprang to life after around 140 years of sleep. It started with a shallow earthquake directly under the mountain followed by the opening of steam vents and many more earthquakes. By the Middle of May there was a tremendous bulge on the north side of the mountain which was growing at the rate of 5 feet a day. Finally on May 18, 1980, a tremendous land slide occurred in which a major portion of the north flank of the mountain slide down the hill and into Spirit Lake. The water in the lake slopped to the east and up the hills there and rushed back across the land slide and started a mud flow that ran down the Toutle and into the Cowlitz crushing everything in its way and finally reached the Columbia River and clogged even the mighty Columbia within a day.

Meanwhile back at the mountain, the departure of all the weight on the side of the mountain allowed the steam from melted snow and ice which had been trapped inside the mountain to relieve itself. The blowout took 1300 feet off the top of the mountain and ash and pumice drifted in quality all the way to Montana, and in a matter of days was measured around the world.

For my companion page see "[Mt St. Helens Erupts](#)" which features a photo taken by this author of this web site which is published no where other than here.

In August of 2000, I visited Mt. St. Helens and what follows is my report.

Since the eruption extensive tourist/visitor facilities have been developed related to Mt. St. Helens which is now a National Monument. A major highway has been reconstructed to Johnson's Ridge which is an excellent viewing point north of the mountain, a point named after a photographer casualty of the 1980 eruption. The highway departs Interstate 5 at Washington Exit 49 and extends east about 50 miles to its terminus. It is a modern highway with passing lanes on the hills. It does have a number of fairly long 6% grades for those who care. There are multiple visitor facilities along the way. The first is at Silverlake, just 5 miles off of Interstate 5. It features an exhibit center, as well as a wetlands walk on an elevated walkway over a portion of the lake that is filled with wetlands plants.



Coldwater Lake and returning plant life--A panoramic view

Other major visitor facilities include an outlook overlooking the Toutle River Valley, as well as a visitor facility at Coldwater Lake which does have a good view of the mountain, and the final destination at Johnson's Ridge. Within the blast zone the part of the property that was owned by Weyerhaeuser (a major Washington State Timber Company) was salvage logged and replanted. The reforestation is doing nicely, with the trees 20 feet or so tall at this time. Douglas fir was planted at the lower elevations and Noble Fir was planted at the higher elevations.

On the Government land nothing was done to aid reforestation and the dominant plant are dandelions, although a variety of other species are appearing including alder trees in selected locations. To be sure various grasses, clover, lupine, fireweed and other plant life was observed. I also observed animal life ranging from squirrels to Elk.

Obviously, the area has a long ways to go before it fully recovers to the dense forest that it was before the eruption, but it is gradually returning to a forest already, and likely in another 50 years it will be grown up at least to hardwoods. The conifers will likely take longer because of a lack of a handy seed source, but the 'moonscape' appearance is clearly not for ever. The red alder is already started and widely scattered. Once they start out there get large enough to produce a cone crop, I would expect that much of the area will sprout alder trees like oats. The mountain, itself is above timber line and overall the elevations are getting up there for trees so they won't do as well as they might in lower elevations, but alder will grow in pretty harsh climates, and likely the conifers will infill sooner than most expect. The Douglas fir which is native to the area has a pretty unique way of spreading. It produces a cone that 'freeze dries' open to drop its seeds. The seeds have wings on them, and it is thought they will blow for miles under the right conditions (a frozen snow pack and a strong wind).



A large herd of elk in the Toutle River Valley in August 2000. Photographed at a great distance with a 400 mm telephoto and cropped aggressively.



The Toutle River Valley taken from the same vantage point as the elk photo except looking downstream. What you are seeing is the residual river of mud from the mudflow. The river today is no more than 20 feet wide.

Overall, if you are in the area in the summer, this site is a 'must see' and figure on it taking all day.

There is a lot of road to cover, and several places to stop and look. The visitor centers are extensive and have sort film strips as well as a collections of artifacts. You simply cannot take this in without making a day of it.

Source: <http://www.vannatabros.com/helens2.html>

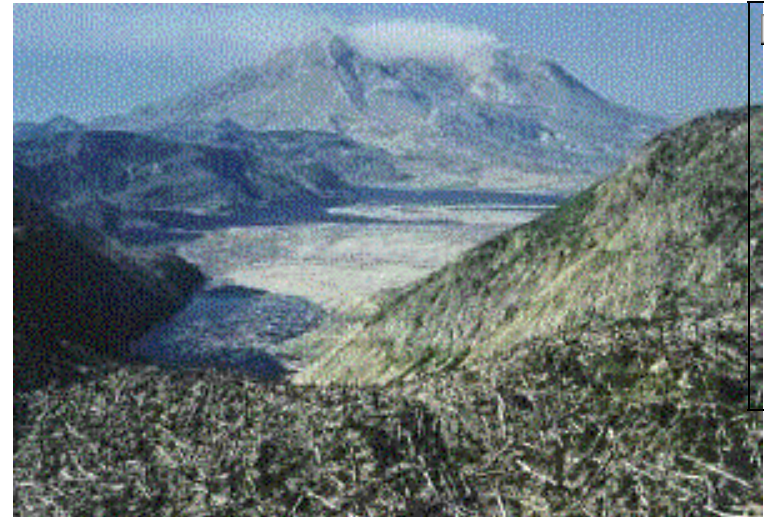
Come Visit and Discover the Drama of an Active Volcano

At 8:32 Sunday morning, May 18, 1980, Mount St. Helens erupted. Shaken by an earthquake measuring 5.1 on the Richter scale, the north face of this tall symmetrical mountain collapsed in a massive rock debris avalanche. In a few moments this slab of rock and ice slammed into Spirit Lake, crossed a ridge 1,300 feet high, and roared 14 miles down the Toutle River.

The avalanche rapidly released pressurized gases within the volcano. A tremendous lateral explosion ripped through the avalanche and developed into a turbulent, stone-filled wind that swept over ridges and toppled trees. Nearly 150 square miles of forest was blown over or left dead and standing.

At the same time a mushroom-shaped column of ash rose thousands of feet skyward and drifted downwind, turning day into night as dark, gray ash fell over eastern Washington and beyond. Wet, cement-like slurries of rock and mud scoured all sides of the volcano. Searing flows of pumice poured from the crater. The eruption lasted 9 hours, but Mount St. Helens and the surrounding landscape were dramatically changed within moments.

A vast, gray landscape lay where once the forested slopes of Mount St. Helens grew. In 1982 the President and Congress created the 110,000-acre National Volcanic Monument for research, recreation, and education. Inside the Monument, the environment is left to respond naturally to the disturbance.



Scientists and visitors follow the changes in the landscape and the volcano. Surviving plants and animals rise out of the ash, colonizing plants catch hold of the earth, birds and animals find a niche in a different forest on the slopes of Mount St. Helens.

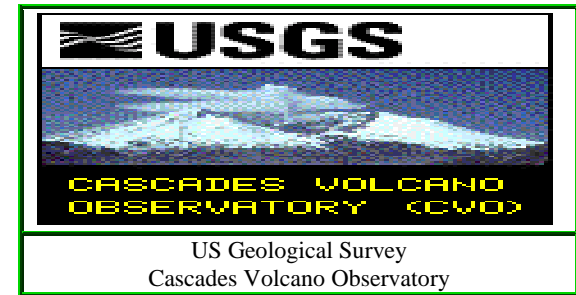
The volcano continued to erupt until 1986, violently at first, then quietly building a lava dome. Thick pasty lava eruptions oozed out, each one piling on top of the next, like pancakes in a sloppy pile. The lava dome is now 920 feet high. The [United States Geological Survey](#) Scientists continue to monitor the volcano for earthquakes, swelling, and gas emissions.

Numerous viewpoints and miles of trails have been created for you to explore by car and foot. During the summer Forest Interpreters lead a wide range of activities, from short walks to amphitheater presentations, to help you understand and enjoy this area. Discover the wonder of winter at Mount St. Helens, where many cross-country ski and snowmobile trails have been created for you.

Each year thousands of climbers make the journey to the crater rim. Permits are required above 4,800 feet year-round.

You can now travel on the east, south and west sides of the mountain. On the west side of the mountain, State Road 504 allows access to five Visitor Centers.

- The Mount St. Helens National Volcanic Monument Visitor Center at Silver Lake is located at mile post 5 on highway 504. This visitor center shows the eruption on May 18, 1980, and talks about volcanoes in general.
- The County owned Visitor Center at Hoffstadt Bluffs is located at milepost 27. This visitor center has a unique gift shop offering merchandise hand crafted from Mount St. Helens ash and a variety of other unique items from around the area.
- The Forest Learning Center, located at milepost 33.5, is operated by Weyerhaeuser in conjunction with the Rocky Mountain Elk Foundation. This Visitor Center leads you through the steps that were taken to salvage the downed lumber and reforest the area. It is possible to take a look through telescopes mounted at the top of their interpretive trail and have the chance to see any elk that may be in the vicinity.



- The Coldwater Ridge Visitor Center is located at milepost 43. This Visitor Center is operated by the Forest Service and is used as an educational guide showing how change come about after an eruption. There is a short trail, "Winds of Change" that is self-guided and shows what happened on May 18, 1980.
- Johnston Ridge Visitor Center is opened in May, 1997. This is the closest Visitor Center to Mount St. Helens and you can look into the Crater and see the dome.
- In April 1996 Congress passed the Omnibus Rescissions and Appropriation Act (PL 104-134) establishing the [Recreation Fee Demonstration Program](#). This law authorized the Forest Service to test collecting, retaining, and reinvesting new admission and user fees at up to 50 selected demonstration areas around the country. Mount St. Helens National Volcanic Monument was selected as one of 10 pilot areas in the Pacific Northwest Region.

Take time to explore and discover the power and the drama of this volcano. For further information please contact the Monument Headquarters of the Gifford Pinchot National Forest, or the Forest Headquarters in Vancouver, Washington.

Source: <http://www.fs.fed.us/gpnf/mshnvm/frmain1.htm>

Mt. Vesuvius

Mt. Vesuvius is one of the worlds most studied volcanoes. It has an altitude of 1281 meters and covers an area of about 480 sq. km. The most noteworthy event in Vesuvius' history occurred in 79 AD. That is the year that Vesuvius brought an end to the cities of Pompeii and Herculaneum.

The development of Mt. Vesuvius has been studied since Roman times. The magma chamber of Vesuvius lies at a depth of 5-6 km, according to current estimates. The volcanic activity started about 10,000 years ago. Periods of frequent eruption alternated with periods of absolute tranquillity that sometimes lasted more than 2000 years. Before the disastrous eruption of 79 AD Vesuvius had been quiet for 1200 years; only a few scientists knew that it was a volcano. The history of this, the most famous eruption in Europe, is known through a detailed description by Pliny the Younger in two letters to Tacitus. Since 79 AD Vesuvius has been active at irregular intervals, but has seldom remained quiet very long. The last major eruption occurred in 1944, but activity may start up at any moment.

Credit for the info above:

Blanchard, Paul. *Blue Guide, Southern Italy; From Rome to Calabria*, New York: W. W. Norton & Company Inc., 1982. (p.46)



Above: Naples in the foreground with Mt. Vesuvius looming ominously in the Background. This picture was taken at about 1pm on a cool spring day. It amazes me that something that looks so large in person can look so small in a photograph. On the right you can see the bay of Naples and beyond that the Sorrento coast line. As is typical in this region, a light haze is being produced by the water vapor in the air.

Below: This is a picture that does not do any justice to the beauty that Mother Nature had created on this day. The rainbow against the mostly clear sky was surreal. It was awe inspiring in person. This picture was shot from the top of the hill in Monte di Procida. What you see from front to back is the town of Bacoli, the gulf of Pozzuoli, the partial rainbow, the city of Pozzuoli (across the water), and Mt. Vesuvius in the background.



Source: <http://touritaly.org/misc/vesuvio-pre.htm>

Cause and Effect

Write down 2 examples of a cause and an effect.

Sample: Cause: Parked in a no parking zone → Effect: Parking ticket

Cause

Effect

1.

→

2.

→