girl scouts of oregon & sw washington

OUR VOLCANO NEIGHBORS

PATCH PROGRAM

In partnership with:

USGS science for a changing world

MOUNT ST. HELENS INSTITUTE

Hey Girl Scout!

Have you ever wondered about the volcanoes in Oregon and Washington? The Cascade Volcanic Arc extends from northern California to southern British Columbia and contains 13 active volcanoes—plus thousands of smaller vents that once erupted but are not likely to erupt again. In fact, about 100 eruptions have occurred in the Cascade Volcanic Arc in the last few thousand years!

Before Mount St. Helens, the most recent eruption was at Lassen Peak in 1914-1917. Girl Scouts of Oregon and Southwest Washington's nearest volcano neighbors are Mt. Hood and Mt. Jefferson in Oregon, and Mount St. Helens, Mt. Adams, and Mt. Rainier in Washington. Active volcanoes are monitored by scientists, like those who work at the U.S. Geological Survey's Cascades Volcano Observatory, in Vancouver, Washington. Maybe in the future you will be one of these scientists!

Mount St. Helens lies in southwest Washington and is an active stratovolcano in the Cascade Volcanic Arc. In 1980, Mount St. Helens erupted dramatically, causing a debris avalanche that removed the upper 400 meters of the summit and formed a large, horseshoe-shaped crater. The eruption also generated a hot blast of wind and rock that devastated the forest to the north. People in eastern Washington were surprised to see ash fall like snow onto their communities.

Since 1980, the crater has been partially refilled by lava erupting from a vent to form a lava dome, and by snow and ice accumulating to form a glacier. Its most recent dome-building eruption was from 2004-2008.

In this patch program, you'll learn about the cultural and geographical significance of Mount St. Helens and other volcanoes.

How to Earn Your Our Volcano Neighbors Patch

Complete at least one activity in each of the five sections in this packet:

- *The Importance of Place*
- *Volcano Vol-cabulary*
- *Volcanic Hazards*
- *People Who Study Volcanoes*
- *Create Your Own Volcano*

Pick the “challenge level” appropriate for you (Level 1 or Level 2). When you’ve finished, share what you learned with other Girl Scouts and head to the GSOSW Shop to purchase your patch!

Mount St. Helens before the 1980 eruption. Notice the dark green forest surrounding Spirit Lake.

Section 1: Consider the Importance of Place

Learn: The Cultural Significance of Place

Land Acknowledgement

Mount St. Helens is a very special place to many communities of people. Many people call this place home and many people in the past and today have a special relationship to this landscape and this volcano.

Some of these communities of people have lived here *since time immemorial*. This means "time since before human memory," thousands and thousands of years ago. Communities that have lived here for so long have experienced many changes at Mount St. Helens including volcanic eruptions. The explosive May 18, 1980, eruption was just one of the most recent changes.

Today people commonly use the name Mount St. Helens but this place has many other names that have important meaning to different people. To the Cowlitz Indian Tribe and the Confederated Tribes and Bands of the Yakama Nation, Mount St. Helens is called ***Lawetlat'la*** (from lawilat, meaning "emitting smoke," and –ɬa, a personifier), a name which translates in English as the "smoker" or "person/being who emits smoke." Other names for Mount St. Helens include ***nšh'ák'w*** from the Upper Chehalis people which translates to "water coming out," and ***aka akn***, a Kiksht name meaning "snow mountain." The name ***Lawetlat'la*** reflects the fact that the volcano Mount St. Helens has erupted many times in the past and that people have witnessed those eruptions. In fact, out of all the volcanoes in the Cascade Range, Mount St. Helens has erupted the most times over the past 4,000 years!

The rivers, forests and land around Mount St. Helens are the homeland of several communities of people including the ***Táytnapam*** (today known as "Upper Cowlitz") and the Klickitat or ***Xwálxwaypam***. ***Lawetlat'la*** is a place for these communities to be connected to the land. Many traditional practices such as gathering food and other resources each season are carried out around and on the mountain. These practices include harvesting huckleberries, hunting elk, fishing, gathering wool of mountain goats, and harvesting plants such as beargrass, cedar roots, and other medicinal plants. Many people travel to Mount St. Helens to participate in these important cultural practices.

In the early to mid 1800s, following early settlement of British and Americans, these tribal communities were disrupted and fractured by disease, warfare and the *dispossession* of tribal lands. Descendents of the different indigenous communities that made their home around Mount St. Helens are now primarily

affiliated with two *federally recognized* Indian Tribes: the ***Cowlitz Indian Tribe*** and the ***Confederated Tribes and Bands of the Yakama Nation***.

Though Mount St. Helens is a part of the traditional lands for these people, it is not on Tribal lands and lies outside direct Tribal control and governance. The land around Mount St. Helens is currently owned by the U.S. government, managed by the Forest Service as a part of the Gifford Pinchot National Forest. Even though the leaders of the Cowlitz Indian Tribe did not sign a treaty giving permission for their lands to be taken away, their lands were sold to settlers and others in the mid 1880s.

After Mount St. Helens erupted in 1980, the area around the volcano was put aside as a place for learning and for people to study what happens after volcanoes erupt. In 1982, it was designated as the Mount St. Helens National Volcanic Monument. A National Monument is a protected area designated by Congress or the president of the United States that is determined to be special and important to the history of the country.

In September 2013, ***Lawetlat'la*** was listed in the National Register of Historic Places for its significance as a Traditional Cultural Property to the Cowlitz Indian Tribe and the Confederated Tribes and Bands of the Yakama Nation. This designation is an important step in acknowledging the special, long-standing relationship between the many people who have had a relationship with this mountain *since time immemorial*.

Take a moment and think: "what is special about your home?" Here at Mount St. Helens, this home is a place where people learn with each other, build community, harvest food and more. As you learn about this volcano, remember the many people who have a special relationship to this place. Please be respectful to the many people who call this place home.

Glossary

Dispossession: The act of taking away land, property or other possessions.

Federally recognized tribe: Tribes in the U.S. that entered into treaties with the U.S. government and qualify for government assistance and other rights granted in treaties. There are over 500 distinct Indian nations in the U.S. that are federally recognized.

Indigenous: The first people to be living in a certain region, who are not later immigrants. Indigenous people are also called native people, first nations, indigenous people.

Reservation: Lands which were set aside by express reservation in a treaty, contract or an executive order between an Indian tribe or tribes and the United States government.

Since time immemorial: Since before time of human memory, many thousands of years ago.

Tribal sovereignty: The right of indigenous people to govern themselves. The powers lawfully vested in Indian tribes as distinct, independent, and political entities, which have never been extinguished by treaty or congressional action by the U.S. government.

Activity Option 1: Discuss the Importance of Place

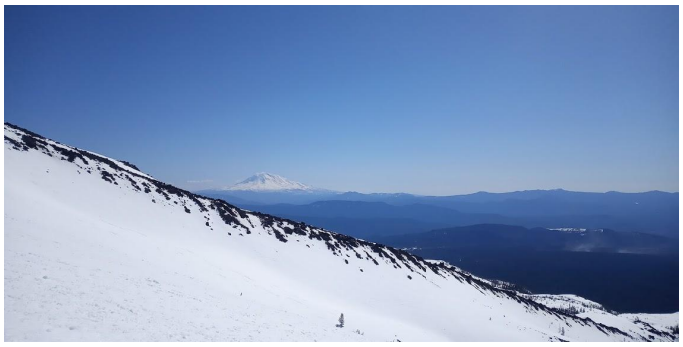
1. **Think about the above land acknowledgement by Mount St. Helens Institute.**
2. **Choose your challenge and complete level 1 or 2 of this activity.**

Level 1: Discuss the following questions with a family member or friend.

- *What are special places for you, your family and/or friends?*
- *What special names do you or your family have for places?*
- *What do you know about tribal communities in your area?*

Level 2: Choose a video, story, or activity to learn more about the connection between communities and land.

- Learn more about the meaning of the word *indigenous* through this video called "The word Indigenous - explained | Canada Kids."
- Read about Lawetlat'la (Mount St. Helens) as a Traditional Cultural Property.
- Since time immemorial K12 curriculum WA state contains numerous activities and resources to learn more about tribal communities in Washington State.
  - A lesson called "Native American Story Connections" developed by WA State Office of Superintendent of Public Instruction with stories of the Pacific NW and guide for student questions. This lesson includes oral history recordings in which stories are told about the plants and features of the landscape and tribal connection to the land. The stories were told by Roger Fernandes of the Lower Elwha Klallam tribe.
  - Map and translation of indigenous place names in Washington state.
- Learn more about the Cowlitz Indian Tribe and their relationship to Mount St. Helens.
- "Making the List: Mount St. Helens as Traditional Cultural Property, a Case Study in Tribal/Government Cooperation." Journal of Northwest Anthropology, Richard H. McClure and Nathaniel D. Reynolds, 2015.



Explore More: View an interactive map of all of the indigenous communities in North America that call this place home, and explore an interactive Storymap with activities documenting the relationship of indigenous communities in the Pacific Northwest to land.

Activity Option 2: Time Travel to the Past

3. **Watch the video "Motion of the Mountain" by Mount St. Helens Institute and Washington State Parks.**
4. **Choose your challenge and complete level 1 or 2 of this activity.**

   Level 1: Create your own dance moves to represent the motion of Mount St. Helens. You can use the same dance moves in the video or make up your own moves.

   Level 2: Imagine that you experienced the 1980 eruption of Mount St. Helens. Think about the reflections in the oral history interviews that were shared in the video. What aspect of the eruption would you have wanted to witness? What might you remember from this event? Write a story to share about your experience.

   Explore More: Watch this video from the United States Geological Society to hear scientists share their experiences around the 1980 eruption.

Section 2: Discover Volcano Vol-cabulary

Learn: How to Describe Volcanoes

Daisies: Look up the meanings of these volcano words: *Volcano, Lava, Ash, Magma, Eruption, Volcanologist*

Brownies: Look up the meanings of these volcano words: *Volcano, Lava, Ash, Magma, Eruption, Volcanologist, Shield Volcano, Stratovolcano, Cinder Cone, Vent, Crater, Caldera, Lava Tube, Pumice, Earthquake, Lahar, Tsunami*

Cadettes, Seniors and Ambassadors: Look up the meanings of these volcano words: *Volcano, Lava, Ash, Magma, Eruption, Volcanologist, Shield Volcano, Stratovolcano, Cinder Cone, Vent, Crater, Caldera, Lava Tube, Pumice, Earthquake, Lahar, Tsunami, Active Volcano, Extinct Volcano, Igneous, Fault, Tectonic Plate, Subduction Zone, Ring of Fire, Seismograph, Seismologist, Geophysicist, Geyser, Fumarole*

Activity: Speak Like a Volcanologist

1. **Review the words above and make sure you understand their meanings.**
2. **Choose your challenge and complete level 1 or 2 of this activity.**

Level 1: Draw a picture or write a short explanation of these volcano words. Create a matching game with your words to play with members of your Girl Scout troop.

Level 2: Draw a picture or series of pictures and label parts of a volcano. Be sure to clearly show the differences between paired words like *Lava* and *Ash*, and *Magma* and *Lava*.

Explore More: Find answers to your volcano questions with info from the USGS Volcano Hazards Program and Smithsonian Global Volcanism Program.

Section 3: Understand Volcanic Hazards

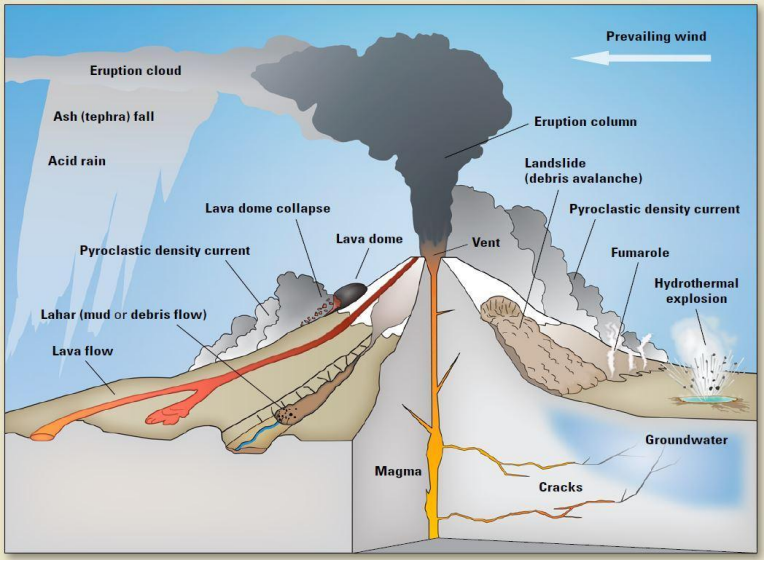
Learn: Volcanic Hazards and How to Prepare

Many people live near volcanoes, and you might be one of them! Review the USGS Living with Volcano Hazards fact sheet to see what volcanic hazards exist and how you can stay prepared. Then, see what hazards exist in the Cascade Range in Oregon and Washington.

Activity: Be Aware of Volcanic Hazards

1. **Using the resources above, think about what volcanic hazards might exist near you.**
2. **Choose your challenge and complete level 1 or 2 of this activity.**

Level 1: Create a skit about the different hazards that could occur at a volcano if it erupted, acting out what each hazard would be like. Or, create a skit acting from the perspective of someone who lives near the volcano.



Level 2: Do you live near a volcano or visit them? Look at a hazard map (Oregon or Washington) and find where you live, work or play and the nearest volcano. What types of hazards might you experience if the volcano erupted? What types of measures should you take to make sure you are safe during the next eruption?

Explore More: Examine more hazard maps in the region and see if you recognize any of these places.

Section 4: Learn from People Who Study Volcanoes

Learn: What Professional Volcanologists Do

Volcanologists are scientists who study volcanoes. Read about what they do, then read or hear from a female volcanologist about their work:

- Alexa Van Eaton, volcanologist at the Cascades Volcano Observatory
- Cynthia Gardner, former Scientist-in-Charge of the Cascades Volcano Observatory
- Kristi Wallace, volcanologist at the Alaska Volcano Observatory
- Jessica Ball, volcanologist at the California Volcano Observatory
- Maggie Mangan, founder and former Scientist-in-Charge of the California Volcano Observatory

Activity: Imagine Being a Volcanologist

1. **Learn from at least one of the volcanologists above about their career.**
2. **Choose your challenge and complete level 1 or 2 of this activity.**

Level 1: What do you think the best part of the job is, and what do you think the worst part of the job is? Draw a picture of what a volcanologist does, or act out a skit of what it is like to be a volcanologist and the types of challenges you may encounter.

Level 2: Write down the types of skills and training you think are necessary to be a good volcanologist. Do you have the same skills? Make a plan for how you could become a volcanologist if you wanted to. What types of things do you want to study? What places do you want to visit?

Explore More: Find out if there are programs that you can sign up for, like Mount St. Helens Institute's GeoGirls.

Section 5: Visit or Create a Volcano

Learn: Volcanoes Near You

There might be a volcano near you that you can visit in real life! Here are some sites in Oregon and Washington that you could visit:

- Mt. Hood, Oregon
- Mt. Rainier Interpretive Center, Washington
- Ape Caves, Washington
- Mount St. Helens Interpretive Center, Washington
- Johnston Ridge Interpretive Center, Washington
- Weyerhaeuser Forestry Learning Center, Washington
- Sediment Retention Dam on the North Fork Toutle River, Washington
- Lava fields, eastern Oregon

- Lava Beds National Monument, southern Oregon
- Crater Lake and Wizard Island, Oregon

If you're able, take a field trip to one of these local sites to see how volcanoes have changed the earth's surface. Or, you can take a virtual tour:

- Virtual tour of The Hummocks Trail on Mount St. Helens and 360 degree visual

Activity: Create Your Own Volcano

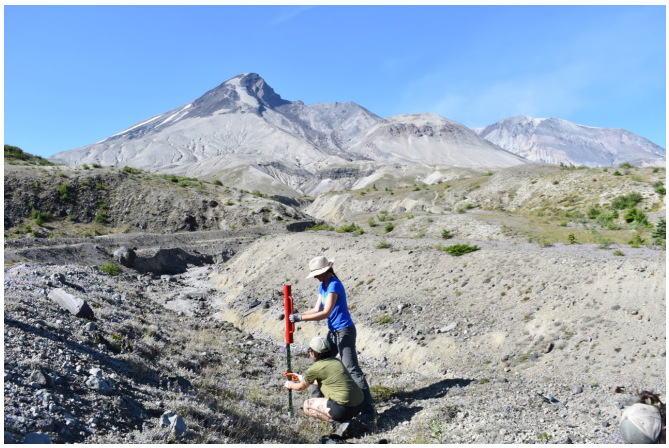
1. **Choose your challenge and complete option 1, 2 or 3 of this activity.**

   Build a working model of a volcano with your Girl Scout troop or family, using any method described below or another activity you find. Share your volcano model with another Girl Scout troop, your class at school, or at a science fair. (And, if you want to share your experience with council, show us what you did by sending photos to outdoorprogram@girlscoutsosw.org!)

   Option 1: A Glacier A'Growing with Mount St. Helens Institute
   Use ice cream and cookies to create an edible volcano!

   Option 2: Volcanoes in Art with Mount St. Helens Institute
   Follow step-by-step instructions to create volcano artwork!

   Option 3: Build a volcano using household materials
   Use a large rigid board as a base for your volcano. You may build the model out of papiermâché, clay, salt dough or other formable material. When building your model, be sure to add a small, wide-mouthed jar into the top of the cone. This will act as the magma chamber for your volcano. It is suggested that you erupt your volcano outside, or in a large, well-ventilated room.



In addition to the volcano model you will need:

- 1 quart jar or measuring cup
- 4 tablespoons baking soda
- ¼ cup vinegar
- ¼ cup dishwashing liquid
- red food coloring
- ½ cup water

Mix all the ingredients except the baking soda in the jar. This will be enough solution for a few eruptions. Place the baking soda in the small jar in the top of the volcano model. Pour some of the mixture into the small jar. If there is no eruption right away, stir the contents with a stick.

When you want to make a new eruption, place fresh baking soda in the small jar and add more solution. When the baking soda and the vinegar mix together they form a bubbly gas called carbon dioxide. The bubbles mix with the soap to form "lava." Real volcanoes work in almost the same way. When hot magma mixes with gas inside the core of the earth, it rushes to the surface in the form of hot lava.

Explore More: Other Famous Volcanoes

Choose one of the volcanoes listed below and discover what makes it famous. *Mazama, Etna, Lassen, Paricutin, Krakotoa, Mauna Loa, Pinatubo, Vesuvius, Surtsey, Loihi, or another volcano you find.*

- What kind of volcano is/was it?
- Where is/was it located?
- What happened when it erupted?
- Did a volcano erupt on your birthday? Look at the Smithsonian Global Volcanism Program webpage to find out!

Congratulations, Girl Scout!

By completing an activity from each of the five sections in this packet, you've completed the steps to earn your patch, available at the GSOSW Shop. Feel free to share your experience by emailing outdoorprogram@girlscoutsosw.org.

If you want to explore more volcano activities, check out Volcano Tuesdays through Mount St. Helens Institute. To learn more about volcanoes in the Pacific Northwest, check out the U.S. Geological Survey's Cascades Volcano Observatory.

The U.S. Geological Survey and Mount St. Helens Institute generously offered the time and activities to create this patch program.