

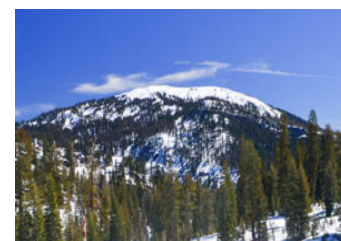
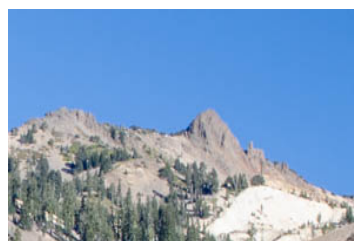
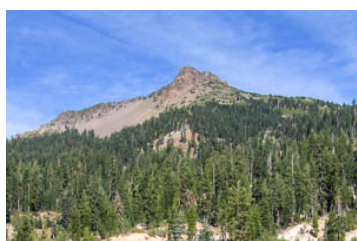
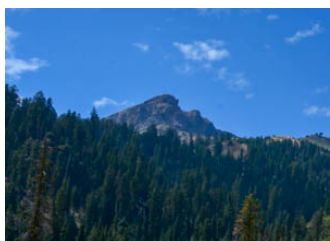


Junior Park Explorer

Lassen Volcanic National Park

Mystery of Mount Tehama

Imagine you are standing almost a mile deep inside a stratovolcano. Well, 400,000 years ago you would have been! The area around Sulphur Works is believed to have been the main vent for Mount Tehama, a stratovolcano that started erupting about 600,000 years ago. By 400,000 years ago, it had reached its full height of 11,500 feet. Look around you in a full circle. Can you spot the mountains pictured below? They are all remnants (left over bits) of Mount Tehama.



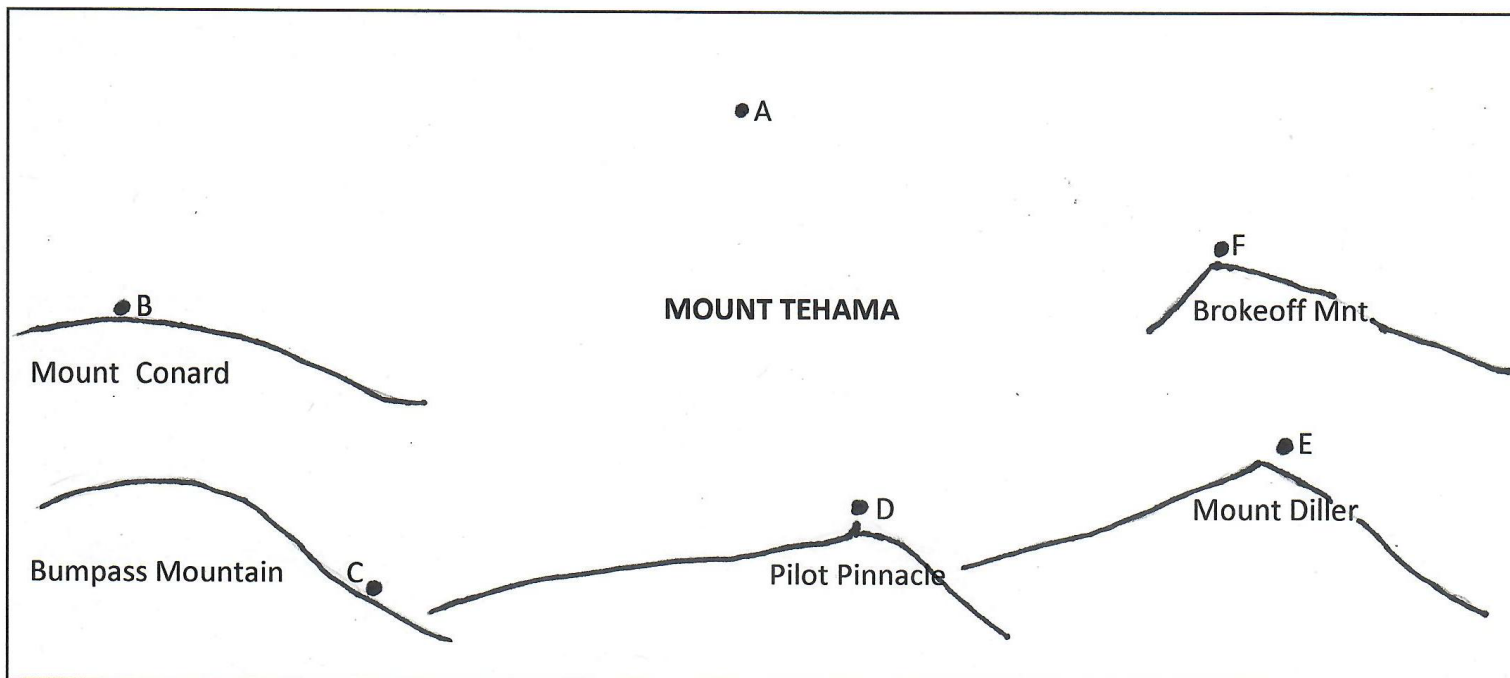
Remnant 1 – Brokeoff Mountain Remnant 2 – Mount Diller

Remnant 3 – Pilot Pinnacle

Remnant – Mount Conard

Activity 1 - See if you can find these remnants on your park map. Trace a circle from one mountain to the next to outline the footprint of Mount Tehama. Be sure to include Little Hot Springs Valley inside the footprint.

Activity 2 - Use the diagram on the next page to reconstruct Mount Tehama. Connect point A to point B, A to C, A to D, A to E, & A to F, individually. Can you see Mount Tehama in your imagination? Color in the mountain if you wish.

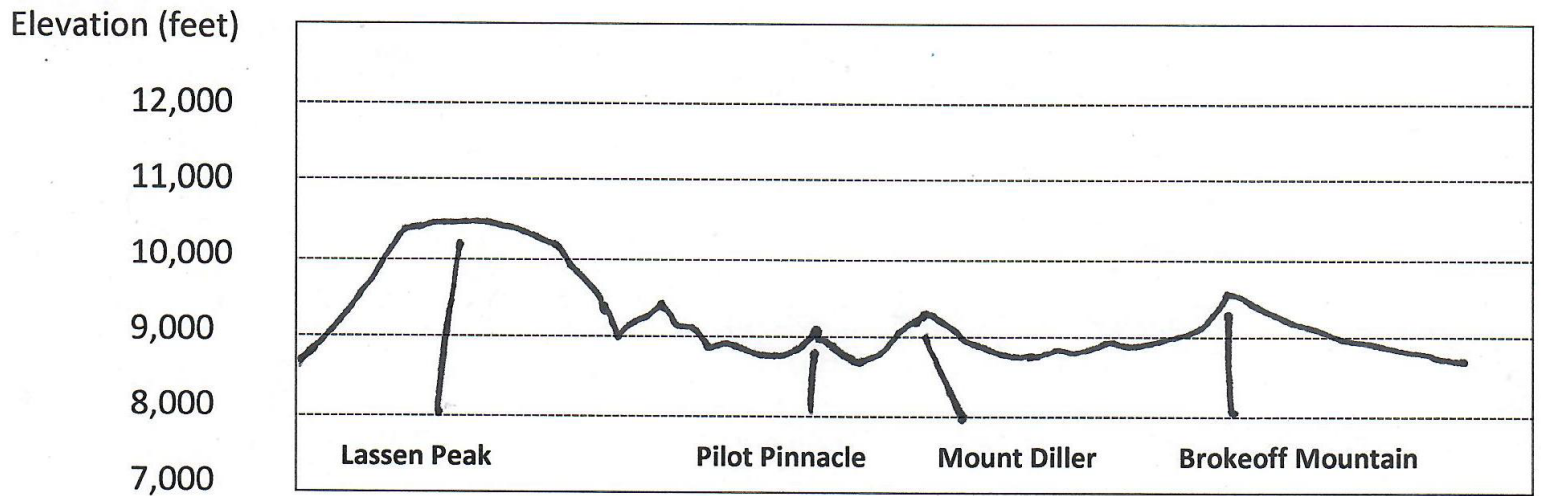


Activity 3 - Another way to reconstruct Mount Tehama is as a view from down in the Sacramento Valley. On the next page, check out how the skyline of Lassen Volcanic National Park looks today, looking east from near Redding.

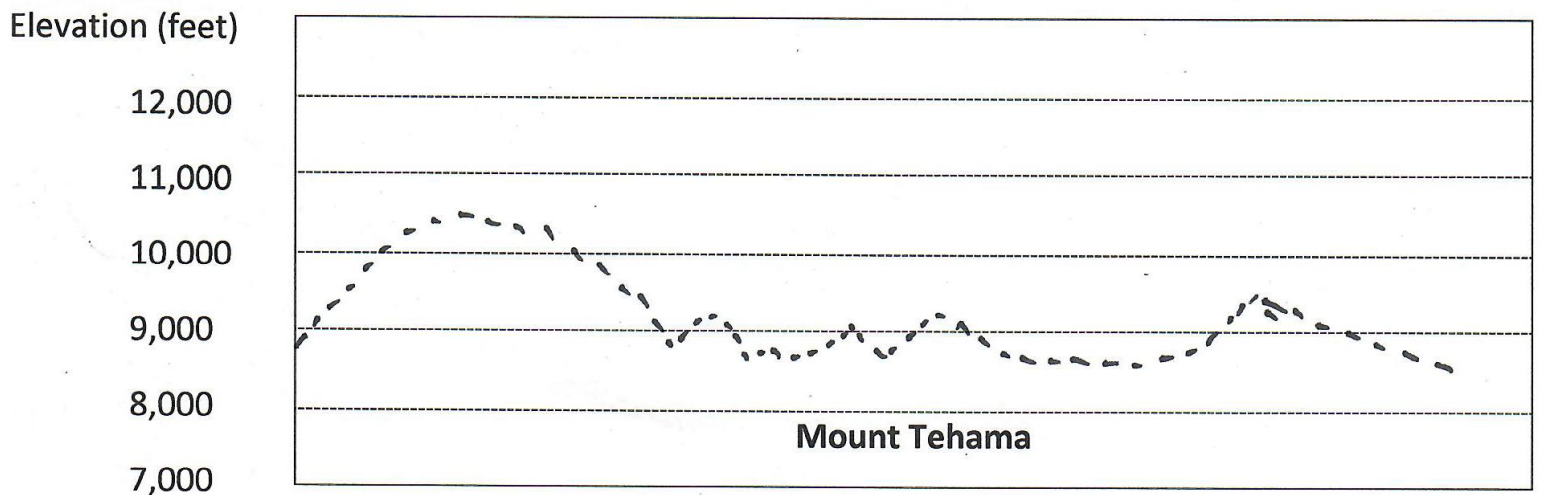
Can you draw what the skyline might have looked like when Mount Tehama was at its full height of 11,500 feet, 400,000 years ago? Use the graph on the next page. Some hints:

1. Lassen Peak formed on the lower east side of Mount Tehama but only 27,000 years ago. So, it was not yet formed 400,000 years ago.
2. Brokeoff Mountain was part of the west side of Mount Tehama.

The skyline of Lassen Volcanic National Park today. Looking east from near Redding, CA.



Draw a possible skyline from the same viewpoint 400,000 years ago.



***Bonus Question:** Mount Tehama was made of at least 20 cubic miles of rock and other material. Lassen Peak contains about .6 cubic miles. How many times larger was Mount Tehama than Lassen Peak? (answer on page 3)

The Case of the Missing Volcano

Calling all detective scientists! Mount Tehama is disappearing. Can you help us figure out why?

Known Facts: About 400,000 years ago, Mount Tehama started disappearing. Today, we only have the remnants you've already spotted. So, what happened? Use your best detective skills and try to figure out why so much of Mount Tehama is gone.

Clues:

- As glaciers move slowly down a mountain, even large rocks can be ground into pebbles and sand.
- All the heat and acid in hydrothermal (hot water) areas, like here at Sulphur Works, change volcanic rock into a very soft, white, claylike mineral called kaolinite.
- It took at least 200,000 years for Mount Tehama to largely disappear and it is still disappearing today.
- Snow, wind and rainwater can slowly carry away dirt and small rocks from a mountain.

Possible Solutions:

So, detective scientist, which of these choices is the best explanation for Mount Tehama's disappearance? (answer below)

- a) It had a massive eruption, emptying the magma chamber. The volcano then collapsed into the chamber.
- b) It blew itself apart, scattering rock debris for hundreds of miles.
- c) It was slowly washed away, and the bits and pieces were carried downstream. Some, probably, eventually, reached the Pacific Ocean.

Hint: Look at Sulphur Creek on the east side of Sulphur Works. What do you notice?

Can you find any kaolinite (white, claylike mineral)? Where is it?

Can you discover why the water here is so acidic? Check out the signs around the area.

Answers

Mount Tehama was about 30 times larger than Lassen Peak. It contained roughly 30 times the amount of material even though it was only about 1,000 feet higher. The "footprint" of Mount Tehama was much larger than that of Lassen Peak.

The correct answer is C. If you looked at Sulphur Creek on the east side of Sulphur Works, you'll have noticed the water is all gray and murky. That's Mount Tehama still being washed away today.

The hot water here is acidic because of sulfuric acid. There are bacteria-like organisms called extremophiles living in the mud pots and fumaroles. They eat some of the minerals and produce additional acids.