

# Webelos Geology Badge

Find a partner. Work with your partner to answer the questions below.

You probably brought a **pencil** today for taking notes. Which of these minerals and rocks might have gone into making your pencil?

- lead ore, such as galena
- graphite
- clay
- copper ore, such as chalcopyrite
- zinc ore, such as sphalerite
- rutile (titanium dioxide)
- petroleum (crude oil — technically not a rock or mineral)



Now, check the places you might take your Webelos den in order to **see some geology**.

- Natural History Museum
- La Brea Tar Pits
- California Science Center
- Griffith Observatory
- California Oil Museum (Santa Paula)
- Cabrillo Marine Aquarium (San Pedro)
- Eaton Canyon (Pasadena)
- Mountains or desert (any trail)
- Beach (any beach)
- Rock stores, such as Burminco (San Dimas)
- Local colleges and universities (most)
- Subway stations (train, not sandwich!)
- A local ice cream shop
- City Parks
- Your own backyard!

And now, some **matching questions!** Draw lines connecting the official California symbol to the correct name.

- |                           |                 |
|---------------------------|-----------------|
| California State Fossil   | Serpentine      |
| California State Gemstone | San Joaquin     |
| California State Mineral  | Saber-tooth cat |
| California State Rock     | Gold            |
| California State Soil     | Benitoite       |



**Which of these had a greater value?**

- The total amount of aggregate (sand and gravel) mined in California last year.
- The total amount of gold *and* silver mined in California last year.

For the Geology Badge, the boys have to explain the **causes** of: volcanoes, geysers, earthquakes and mountain building.

Put a check next to the phenomena that are usually associated with plate tectonics.

- Volcanoes
- Geysers
- Earthquakes
- Mountain building



# Resources for the Geologist Badge

## #1) Collect five geologic specimens...

We're surrounded by millions of other people, and good collecting locations are gone, illegal or inaccessible. One alternative is a rock shop. Unfortunately, the very best rock shop, Burminco, has apparently gone out of business.

## #2 & 4) Rock and mineral uses

<http://www.mii.org/commonminerals.html>

<http://library.thinkquest.org/J002289/uses.html>

<http://www.rocksforkids.com/RFK/uses.html>

What is cement — <http://www.buildeazy.com/newplans/eazylist/cement.html>

## #3) Mineral hardness scale

<http://www.sdnhm.org/archive/kids/minerals/howto-hardness.html>

<http://chemistry.about.com/od/geochemistry/a/mohsscale.htm>

Also, you can buy a hardness scale from educational supply shops online.

## #5) Cause of a volcano, a geyser, or an earthquake

<http://volcano.oregonstate.edu/>  
Volcanoes are cool, and this is the "Volcano World" web site.

<http://www.enchantedlearning.com/subjects/volcano/activities.shtml>  
Some parts of this web site require a subscription to access.

<http://volcanoes.usgs.gov/about/edu/dynamicplanet/>  
Good information about volcanoes and plate tectonics

<http://earthquake.usgs.gov/>  
Earthquakes are a little scary, but this web site has the latest information, the "did you feel it?" surveys, and lots of general earthquake information.

## #6) How are mountains formed?

<http://www.universetoday.com/29833/how-mountains-are-formed/>

<http://en.wikipedia.org/wiki/Mountain>

## #7) Fossils

In most places, *fossil collecting is not legal*. And it's often difficult, which can be frustrating for young boys.

The Natural History Museum sometimes leads fossil collecting tours of Silverado Canyon, in Orange County — <http://www.nhm.org/site/>

A great place to see fossils is La Brea Tar Pits — <http://www.tarpits.org/>

At Cabrillo Beach you can see fossils in the rocks, and Cabrillo Aquarium has fossils on display — <http://www.cabrillomarineaquarium.org/>

## #8) field trip to a geological site...

There are many places that qualify as a "geological site". Here are just a few:

Page Museum at La Brea Tar Pits — <http://www.tarpits.org/>  
(The Page Museum made Smithsonian.com's list of the top ten geological sites in the country!)

Natural History Museum of Los Angeles County — <http://www.nhm.org/site/>

Cabrillo Marine Aquarium — <http://www.cabrillomarineaquarium.org/>

California Science Center. See the earthquake exhibit on the second floor — <http://www.californiasciencecenter.org/>

Vasquez Rocks County Park — they have a geology trail, and lots of rocks to climb and trails to hike.

## BL1) Define geology

<http://geology.com/articles/what-is-geology.shtml>

## BL2) Collect rocks

Rocks can be found all over, including in your own backyard! Some of my favorite places to take scouts for rock collecting are:

Angeles National Forest — <http://www.fs.usda.gov/angeles>

Eaton Canyon — <http://www.ecna.org/>

Forrestal Nature Reserve — [http://www.pvplc.org/\\_lands/forrestal.asp](http://www.pvplc.org/_lands/forrestal.asp) (No fossil collecting)

## BL3) The difference between a rock and a mineral

<http://www.rocksandminerals.com/rockcycle.htm>

## General web sites:

<http://meritbadge.org/wiki/index.php/Geologist>  
This web site has links to many more web sites, including worksheets and general resources.

<http://meritbadge.org/wiki/images/b/b0/Geologist.pdf>  
A three page workbook (with links) for the geologist badge.

<http://www.cubroundtable.com/assets/pdf-documents/Geologist-Activity-Badge-Outline.pdf>  
Another workbook — this one's 17 pages long.

<http://www.conservation.ca.gov/cgs/Pages/Index.aspx>  
The California Geological Survey

<http://geology.com/articles/san-andreas-fault.shtml>  
The San Andreas fault

## What else?

You are encouraged to send me an e-mail if you have questions:

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