

Grade 7

Science Focus



Lab Workbook

Unit 5
Planet Earth

A Geologist's Mystery

Investigation 5-A
Pages 358 – 359

Problem: How can you identify different Minerals?

Hypothesis: _____

Investigative Procedure: Follow the directions outlined on pages 358-359

Data Collection:

Mineral #	Colour	Crystal Shape	Lustre	Streak	Hardness	Other Properties	Mineral Name

Analysis of Data:

1. _____

2. (a) softest _____ hardest _____

(b) Yes No _____

3. (a) _____

(b) _____

4. _____

Conclude and Apply:

5. Yes No _____

6. (a) _____ because _____

(b) _____ because _____

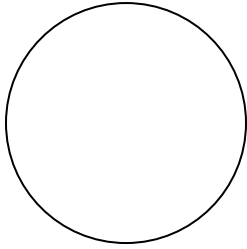
7. _____

8. Design Your Own Procedure : **Order of Testing Mineral Properties**

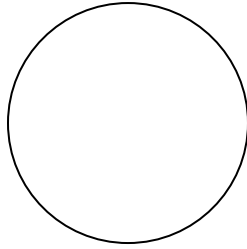
Extending Your Skills

9. Definition of Hardness _____

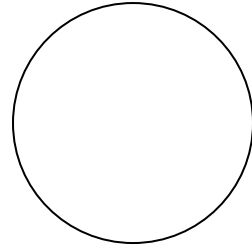
10.



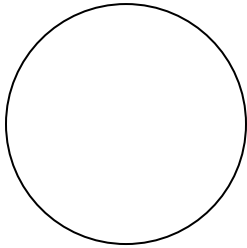
Mineral Sample A



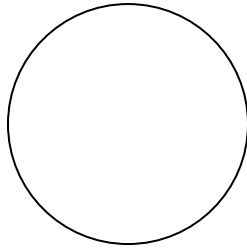
Mineral Sample B



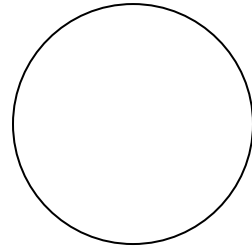
Mineral Sample C



Mineral Sample D



Mineral Sample E



Mineral Sample F

Distinguishing Property for the Local Mineral Samples

Sample A	Sample B	Sample C	Sample D	Sample E	Sample F

Lab Investigation 5-A submitted by _____

Date _____

Cool Crystals, Hot Gems

Investigation 5-B
Pages 362 – 363

Problem: How does the rate of cooling affect crystal size?

Hypothesis: _____

Investigative Procedure: Follow the directions outlined on pages 362-363

Scientific Illustration:

Description of Crystals in Sample 1

Description of Crystals in Sample 2

Analysis of Data:

1. _____

2. Yes No _____

3. Controlled Variables: _____

_____	_____
_____	_____
_____	_____

4. Manipulated Variable: _____

5. Responding Variable: _____

Conclude and Apply:

6. _____

7. _____ **because** _____

8. _____

9. _____

10. Extending Your Knowledge (Optional)

Scientific Illustration

Explanation of What Happened _____

Lab Investigation 5-B submitted by _____

Date _____

Hot Rocks

Problem: Which variables affect the heat capacity of rocks?

Hypothesis: _____

Investigative Procedure: (How will you investigate the Problem?)

Analysis:

1. Graphic Representation of Data (utilize Microsoft Excel to create your graph)

Title: _____



2. Yes No _____

Conclude and Apply:

3. _____

4. _____

5. _____

6. _____

Lab Investigation 5-C submitted by _____

Date _____

Rocks That Fizz

Problem: Which Rocks are affected by Acid Rain and Groundwater?

Hypothesis: _____

Investigative Procedure: Follow the directions outlined on page 375

Rock Type (Name)	General Observations	Hydrochloric Acid Test
granite		
chalk		
sandstone		
shale		
marble		
limestone		
unknown sample A		
unknown sample B		

Analysis of Data:

1. Manipulated Variable: _____

2. Responding Variable: _____

Conclude and Apply:

3. _____

4. _____

5. Unknown **Sample A** is _____

Unknown **Sample B** is _____

Extending your Skills

6. Definition of **Chemical Weathering**

Lab Investigation 5-D submitted by _____

Date _____

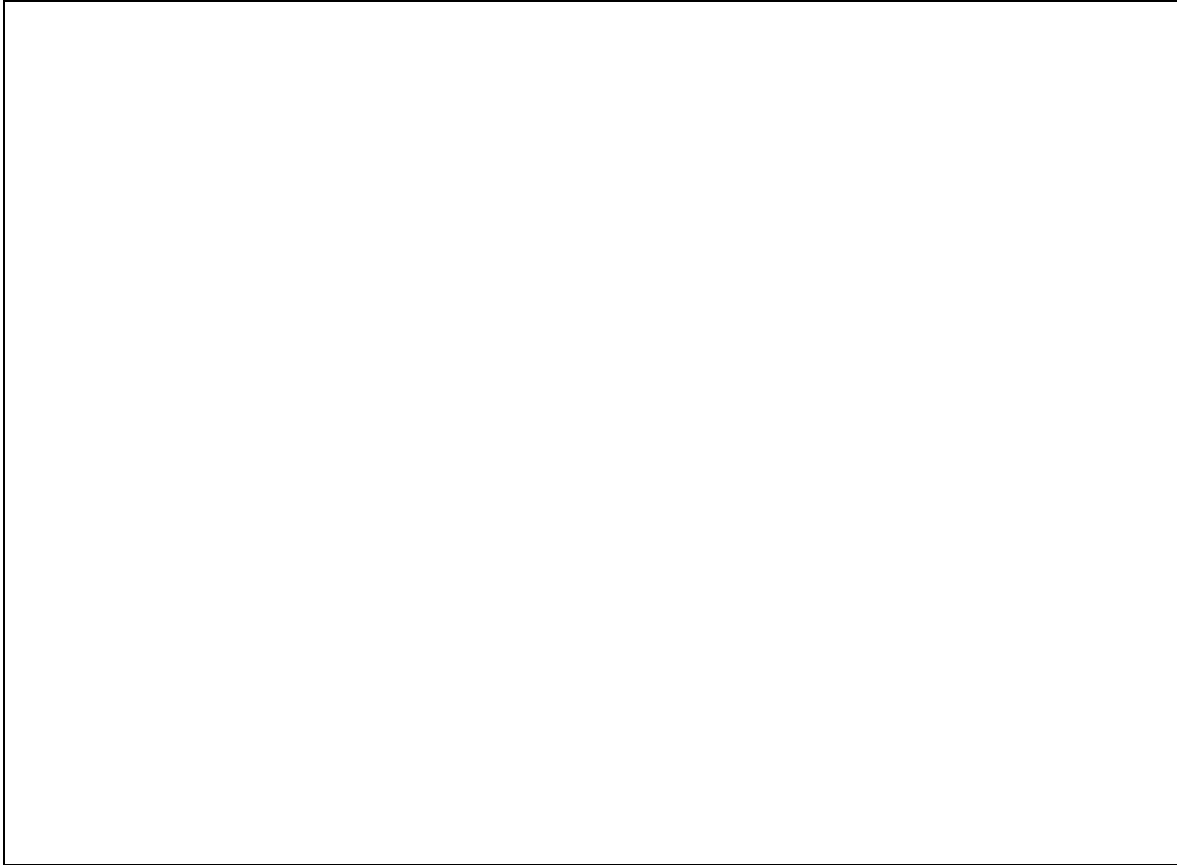
Nature's Design

Investigation 5-E
Page 379

Challenge: Design a model to describe the origin and history of a lake, or a river valley in your area, or an area of Canada.

Materials and Procedure: Follow the directions outlined on page 379

Design Blueprint: (This is a labelled sketch of the model)



Evaluate:

1. (a) Yes No _____

(b) Yes No _____

2. (a) _____

(b) _____

3. Extend Your Skills:

A working model would need _____

(Sketch Modifications)



Model (Lab 5-E) submitted by _____

Date _____

Give Me a Clue!

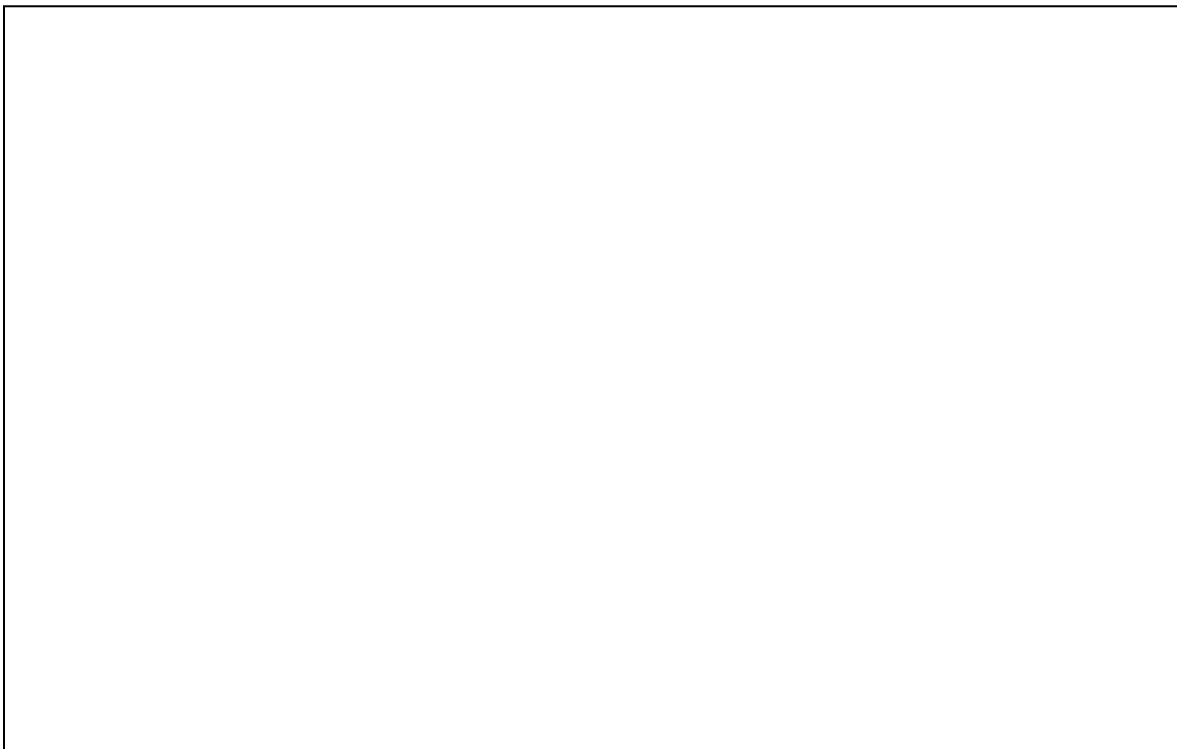
Investigation 5-F
Page 386

Problem: What clues do fossils and rocks provide about the ancient world? Can you make the puzzle pieces fit?

Hypothesis: _____

Investigative Procedure: Follow the directions outlined on page 386

Scientific Illustration: (Fit your map puzzle pieces in this space)



Analysis of Data:

1. _____

2. _____

Conclude and Apply:

3. _____

because _____

4. Yes No _____

Lab Investigation 5-F submitted by _____

Date _____

Building a Model of Tectonic Plates

Problem: What hypothesis about the Earth's crust can you form based on your model?

Hypothesis: _____

Investigative Procedure: Follow the directions outlined on page 391

Observations: (What happened)

Analysis of Data:

1. _____

2. _____

Conclude and Apply:

3. _____

4. _____

5. _____

6. _____

Extend Your Knowledge and Skills

7. _____

8. **Scientific Diagram of model**

9. (Optional)

Lab Investigation 5-G submitted by _____

Date _____

Locate the Epicentres

Investigation 5-H
Pages 400-401

Problem: How can you use the data from seismograph stations to locate the epicentre of earthquakes?

Hypothesis: _____

Investigative Procedure: Follow the directions outlined on pages 400-401

Part 1: Data Collection:

Distance (km)	Difference in Arrival Time
1500	2 min; 45s
2250	
2750	
3000	
4000	5 min; 35s
7000	
9000	

Analysis of Data:

1. _____

2. _____

Part 2: Data Collection:

<u>Seismograph Location</u>	<u>Wave Type</u>	<u>Difference in Wave Arrival times</u>	<u>Distance (km)</u>
Edmonton	P		
	S		
Iqaluit	P		
	S		
Whitehorse	P		
	S		
Ottawa	P		
	S		
Yellowknife	P		
	S		

Analysis of Data:

1. epicentres _____

 cities near epicentres _____

2. _____

3. _____

Conclude and Apply:

4. _____

5. _____

Lab Investigation 5-H submitted by _____

Date _____

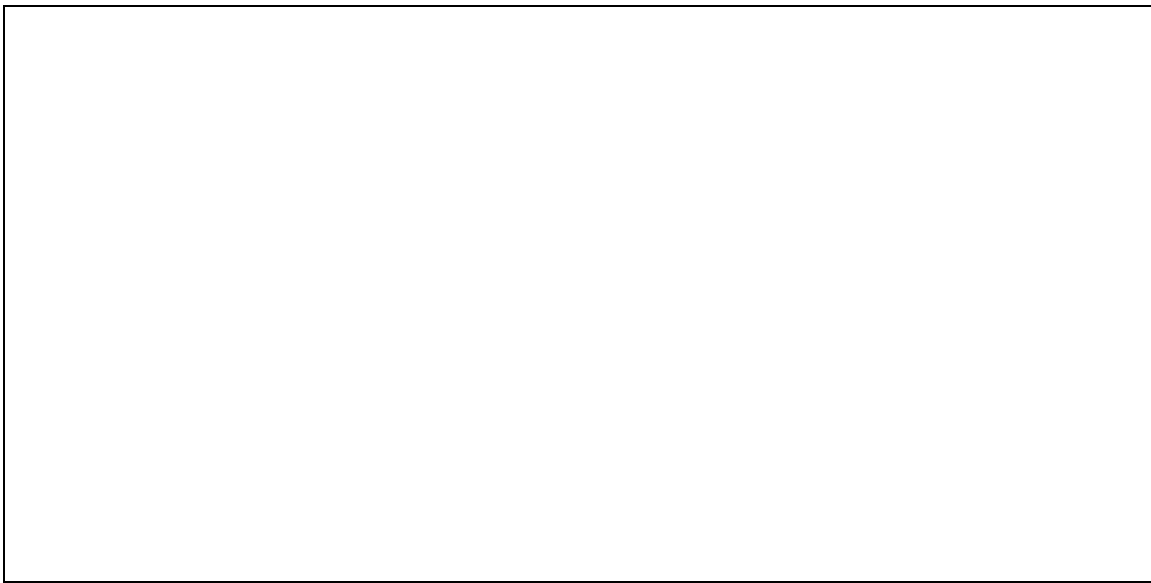
Plotting Earth's Movement

Investigation 5-I
Page 402

Problem: How can earthquake locations tell us how the plates are moving?

Hypothesis: _____

Investigative Procedure: Follow the directions outlined on page 402



Analysis of Data:

1. (locate future earthquakes using ▲ on graph above)

2. (—————▶ indicates the motion of the plates)

3. _____

4. convergent divergent transform

Lab Investigation 5-I submitted by _____

Date _____

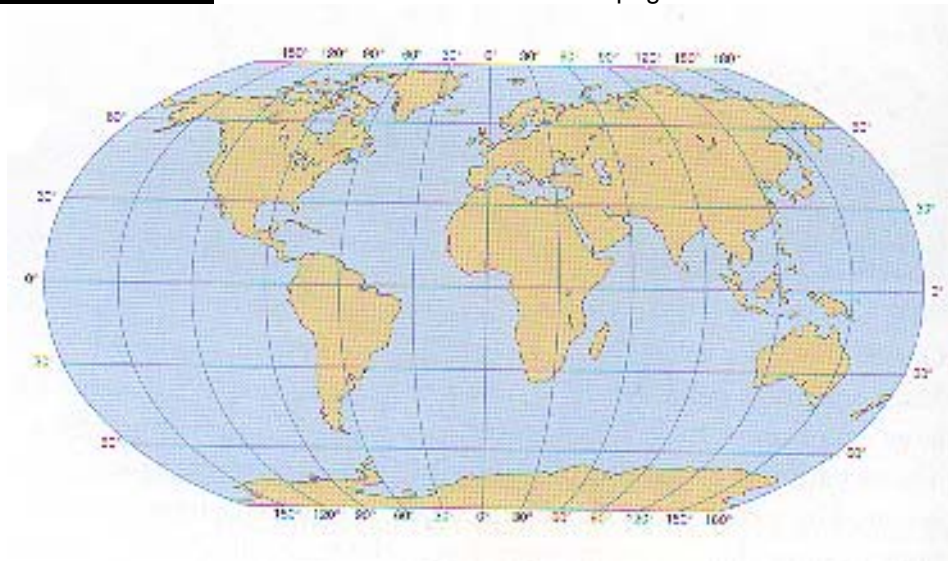
Patterns in Earthquake and Volcano Locations

Investigation 5-J
Pages 400-401

Problem: Is there an observable pattern in the occurrence of earthquakes, volcanoes, and plate boundaries?

Hypothesis: _____

Investigative Procedure: Follow the directions outlined on pages 400-401



Analysis of Data:

1. near volcanoes unrelated

2. _____

3. _____

4. _____

5. _____

Conclude and Apply:

6. _____

7. _____

Extend Your Knowledge:

Try the following URL's to get the information you will need to answer this question

<http://www.nrcan.gc.ca/gsc/>

<http://earthquake.usgs.gov/>

8. _____

Lab Investigation 5-I submitted by _____

Date _____

Building a Mountain - Building Theory

Investigation 5-K
Page 415

Problem: Where are the major mountains found on Earth's surface and what has created them?

Investigative Procedure: Follow the directions outlined on page 415

Some Research Internet Links to help complete this Lab

<http://www.highalpex.com/Peaklist/peaklist.html>

http://www.windows.ucar.edu/cgi-bin/tour_def/earth/interior/mountain_building.html

<http://www.wincom.net/earthexp/n/mdemo.htm>

http://wwwneic.cr.usgs.gov/neis/plate_tectonics/rift_man.html

Others you found ...

Hypothesis: _____

Analysis of Data:

1. _____

2. _____

3. _____

Conclude and Apply:

4. _____

5. (1) _____

(2) _____

(3) _____

Extend Your Knowledge:

6. _____

7. Definition of 'mountain'

Lab Investigation 5-I submitted by _____

Date _____

Make a Lasting Impression

Investigation 5-L
Page 421

Problem: What are the best conditions for making a fossil mould and cast?

Investigative Procedure: Follow the directions outlined on page 421

Hypothesis: _____

Analysis of Data:

1. manipulated variable _____

responding variable _____

2. best moulds _____ because _____

poorest moulds _____ because _____

3. _____

Conclude and Apply:

4. _____

Lab Investigation 5-L submitted by _____

Date _____

Where Shall We Drill?

Problem: Where will you drill for oil?

Investigative Procedure: Follow the directions outlined on page 430

Hypothesis: _____

Analysis of Data:

1. Location ____ because _____

2. Location ____ because _____

3. _____ because _____

4. Type of fault was _____
The glacial till is not faulted because _____

Conclude and Apply:

5. _____

6. (Attach block diagram to this page when submitting it)

Lab Investigation 5-M submitted by _____

Date _____

Student Project

The Quest:

Design Your Own Investigation - Unit 5
Page 436 - 437

Problem: Where would you rather live? Near an earthquake fault, or near a volcano?

Project Description

This project is intended to synthesis the key concepts relating to Volcanoes and Earthquakes in the **Unit: Planet Earth**. Students can begin doing this at the beginning of the unit of study and will continue throughout the Unit, integrating ICT Outcomes by preparing and then presenting their conclusion in a '**Power Point**' presentation. In collaborative groups (no more than 3 per group), students will research information on earthquakes and volcanoes, developing search skills by using Internet search engines, as well as other print and visual resources. They will take a position (make a hypothesis) on the question: "**Would you rather live near an earthquake or a volcano?**" The position must be supported with factual information that is properly cited, and students will then defend their position in a 'Power Point' presentation (or, some **other presentation tool** that meets this objective) to their class and teacher.

Students should have basic computer skills
with some previous exposure to presentation tools such, as Power Point, being an asset.

References

Project Reference Site (Appendix)

Internet URL is <http://www.kn.pacbell.com/wired/fil/pages/webearthscie.html>

This unit project could be developed as an alternative to:

Design Your Own Investigation – A CREATIVE CRUST (Science Focus p. 436)

The Research and Fact Finding involved in this project, supports the critical understandings that the students are to achieve from this unit.

Students will be able to use the information gained from the activities in **Topics 5 and 6** to help them in the decision making process.

Appendix 1

The reference site that this project was based on may not always be available, so the web page is presented here for support:

The Quest project was created by Mrs. Friend from [Atascadero Junior High](#)

The URL, for the existing site, that is **not** currently being maintained is:

<http://www.kn.pacbell.com/wired/fil/pages/webearthscie.html>

Earthquakes vs. Volcanoes

An Internet WebQuest on Earth Science

created by Mrs. Friend

[Atascadero Junior High](#)

[Introduction](#) | [The Task](#) | [The Process & Resources](#) | [Conclusion](#) | [HyperText Dictionary](#)

Introduction

Your team and a rival team are given a chance to choose where to live. One team will live near an earthquake fault and the other will live near a volcano. How will you choose? Perhaps you want whether earthquakes or volcanoes are more powerful. Or how often earthquake and volcanoes occur. Maybe you need to determine why earthquake and volcanoes occur. There will be other questions that you will need to answer.

When you use the Internet you usually find that there is a lot more to a topic that you did not learn after only a quick exploration. This is particularly true when we use the Internet for our research because many people post their personal opinions or only know a sliver of the whole story. Each person on your team will learn one piece of the puzzle and then you will come together to get a better understanding of the topic.

The Quest

Would you rather live near an earthquake fault or near a volcano?

The Process and Resources

In this WebQuest you will be working together with a group of students in class. Each group will answer the Task or Quest(ion). As a member of the group you will explore Webpages from people all over the world who care about Earth Science. Because these are real Webpages we're tapping into, not things made just for schools, the reading level might challenge you. Feel free to use the online Webster dictionary or one in your library or classroom.

Phase 1 - Background: Something for Everyone

Use the Internet information linked below to answer the basic questions of who? what? where? when? why? and how? Be creative in exploring the information so that you answer these questions as fully and insightfully as you can.

- [Volcanic Earthquakes](#) - Text document
- [Earth1s Interior](#) - Layers, P and S waves
- [The EQE Earthquake Home Preparedness Guide](#)
- [Volcanic and Geologic Terms](#)

Phase 2 - Looking Deeper from Different Perspectives

INSTRUCTIONS:

1. Individuals or pairs from your larger WebQuest team will explore one of the roles below.
2. Read through the files linked to your group. If you print out the files, underline the passages that you feel are the most important. If you look at the files on the computer, copy sections you feel are important by dragging the mouse across the passage and copying / pasting it into a word processor or other writing software.
3. Note: Remember to write down or copy/paste the URL of the file you take the passage from so you can quickly go back to it if you need to to prove your point.
4. Be prepared to focus what you've learned into one main opinion that answers the Big Quest(ion) or Task based on what you have learned from the links for your role.

Volcanologist

Use the Internet information linked below to answer these questions specifically related to Volcanic Activity:

1. Are the earth's active volcanoes scattered randomly over its surface or clustered along definite zones? Use the web site titled ' Update on Current Volcanic Activity' to plot on a world map recent volcanoes.
2. Are most volcanoes located near the edges or near the centers of continents?
3. Describe a pattern in the arrangement of volcanoes around the Pacific Ocean.

4. Which major cities in the United States are located on or near active volcanoes?
5. Why are there different shapes of volcanoes?
6. What causes volcanoes to erupt?
7. Can scientists predict volcanic eruptions?

- [Volcano Names in Other Languages](#)
- [How BIG are volcanic eruptions?](#) - There is not any single feature that determines the 'bigness', but the following eruption magnitude scale - called the Volcanic Explosivity Index or VEI - is based on a number of things that can be observed during an eruption.
- [Parts of a volcano](#) - This cross-section shows the parts of a volcano. A conduit feeds magma to the surface. Near the surface, the gas expands and fragments the lava into ash. Some magma passes through dikes to feed vents. Some magma intrudes parallel to layers to make sills.
- [Volcano Observatories](#) - Michigan Technological University Volcanoes Page - Volcano Links - Online Observatories
- [Dante1s Peak FAQ1s](#) - GENERAL QUESTIONS ABOUT VOLCANOES AND VOLCANOLOGISTS, MOVIE FACT OR FICTION?, QUESTIONS ABOUT ERUPTION PRECURSORS, VOLCANO MONITORING, and VOLCANO HAZARDS
- [Earth's Active Volcanoes](#) - There is a World Map with 12 regions. When a region is clicked on, specifics come up.
- [Miscellaneous Volcanic Facts, Questions, and Answers](#) - General Volcano Information, Cascade Range Volcanoes, Alaskan Volcanoes, Hawaiian Volcanoes, and Volcanic Features and Phenomena
- [Update on Current Volcanic Activity](#)

Seismologist

Use the Internet information linked below to answer these questions specifically related to Earthquake Activity:

1. Is there any pattern to the location of strong earthquakes? Use the web site titled 'Recent Global Events (Earthquakes)' to plot recent earthquakes on a world map.
2. Is there any relationship between earthquake zones and topography (mountain ranges, plains, oceans, etc.)?
3. Which major cities in the United States are located in earthquake zones?
4. What causes the ground to shake during an earthquake?
5. How do scientists know the exact spot where an earthquake begins?
6. Which seismic waves cause the greatest destruction? Why?

- [Northern California Seismic Network](#)
- [Earthquake Globe](#) - The images on this page show the locations of earthquakes of magnitude 5.5 and larger that occurred over a five-year period.
- [Customized Listing of Recent Arrival Times](#) - Generate a listing of times that phases from recent earthquakes arrived at your seismic station.
- [Global Earthquakes](#) - This is the graphical way to find web earthquake maps for the region you are interested in.
- [Maps And Lists: Current & Weekly Earthquake Activity](#)
- [Santa Barbara Earthquake History](#)
- [Can you read a Quake?](#) - Lesson for students to complete.

- [Putting Down Roots in Earthquake Country](#) - This document is based on the 'Putting Down Roots in Earthquake Country' handbook released to Southern Californians in October of 1995. It is divided into a number of sections to help you find the information you want. This document is a resource to turn to with your questions.
- [Common Earthquake Myths](#)
- [Recent Global Events \(Earthquakes\)](#) - Near-real-time Earthquake Bulletin provided by the National Earthquake Information Service of the USGS.
- [Can you read a Quake?](#) - Lesson for students to complete.
- [The EQE Earthquake Home Preparedness Guide](#)
- [Putting Down Roots in Earthquake Country](#) - This document is based on the 'Putting Down Roots in Earthquake Country' handbook released to Southern Californians in October of 1995. It is divided into a number of sections to help you find the information you want. This document is a resource to turn to with your questions.

Phase 3 - Debating, Discussing, and Reaching Consensus

You have all learned about a different part of Earth Science. Now group members come back to the larger WebQuest team with expertise gained by searching from one perspective. You must all now answer the Task / Quest(ion) as a group. Each of you will bring a certain viewpoint to the answer: some of you will agree and others disagree. Use information, pictures, movies, facts, opinions, etc. from the Webpages you explored to convince your teammates that your viewpoint is important and should be part of your team's answer to the Task / Quest(ion). Your WebQuest team should write out an answer that everyone on the team can live with.

Phase 4 - Real World Feedback

You and your teammates have learned a lot by dividing up into different roles. Now's the time to put your learning into a letter you'll send out for real world feedback. Together you will write a letter that contains opinions, information, and perspectives that you've gained. Here's the process:

1. Begin your letter with a statement of who you are and why you are writing your message to this particular person or organization.
2. Give background information that shows you understand the topic.
STATE THE TASK / QUEST(ION) AND YOUR GROUP'S ANSWER.
3. Each person in your group should write a paragraph that gives two good reasons supporting the group's opinion. Make sure to be specific in both the information (like where you got it from on the Web) and the reasoning (why the information proves your group's point).
4. Have each person on the team proofread the message. Use correct letter format and make sure you have correctly addressed the email message. Use the link below to make contact. Send your message and make sure your teacher gets a copy.

Conclusion

So, where do you want to live? Near an earthquake or a volcano?

Remember, learning never stops.