Webquest: Earthquakes

Introduction:

Thousands of earthquakes occur each and every day. Understanding why and where earthquakes occur can be vital to saving lives and reducing damage caused by earthquakes.

The Task

In this Webquest, you will use the websites below to:

- Relate some earthquake activity to plate boundaries
- Understand where most earthquakes occur
- Learn how to read a seismograph
- Determine the location of an earthquakes epicenter
- Understand earthquake seismic waves
- Discover why it is important to understand the underlying geology before building structures in an earthquake prone area.

The Process (part 1)

1. Go to the website: http://www.sciencecourseware.org
2. Click on: GEOLOGY LABS ONLINE
3. Click on VIRTUAL EARTHQUAKE
4. NEXT click on: "**NEW**: A completely revised version of Virtual Earthquake can be found **HERE**."
5. Then Click underneath the word TUTORIALS**: SP TIME LAG**
6. **Read & Follow the directions!!!**
7. When done: complete the second part of the TUTORIALS**: LATITUDE/LONGITUDE**
8. **Read & Follow the directions!!!**
9. When that is completed… repeat steps 1,2 & 3
10. This TIME scroll to the bottom and CLICK on: **EXCUTE VIRTUAL EARTHQUAKE**
11. **Read & Follow the directions!!!** Work through steps/pages 1 to 12 for any of the earthquakes listed
12. At the very bottom it states "*Choose any one of the following regions to generate a set of seismograms for an earthquake*" YOU MUST DO ALL 4 OF THEM.
13. Print the certificate and ANSWERS at the end…
    1. NOTE: type in your name: District: and for location: type in which site you completed!
14. Print out the page that shows your Virtual Seismologist Certificate and ANSWERS
15. Turn it into the instructor.

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The Process (part 2)

1. Go to the website:

http://environment.nationalgeographic.com/environment/natural-disasters/forces-of-nature/

2. Click on the section labeled earthquakes located under the name: FORCES OF NATURE.
3. Under the title: Forces of Nature, you need to click on the 4th link in on Earthquakes.
4. Work through steps 1 to 7 under the tab labeled "what is an earthquake?" "LAB". Be sure to click on the pictures to see the animations for each step.
5. On step 7: Describe what happens to the structure built upon bedrock during a high magnitude earthquake.

6. On step 7: Describe what happens to the structure built upon landfill during a high magnitude earthquake.

7. On step 7: Describe what happens to the structure built upon a fault zone during a high magnitude earthquake.

8. Click on the tab labeled "Case Studies," select one of the six earthquakes and write down the following information:

   Location:_____

   Date:_____

   Magnitude: _____

   # of Deaths:_____

   Damage (if given):_____

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The Process (part 3)

1. Go to the webpage: http://earthquake.usgs.gov/learning/kids.php
2. Click on "Latest Quakes"
3. Name some of the geographic locations that a number of earthquakes are occurring.

4. Why do you think earthquakes are occurring at these places?

5. Where did the earthquake of greatest magnitude occur over the past seven days? (click on the world list: magnitude 5+ for a list)

6. Click back to the main page.
7. Explore this webpage on your own to discover an interesting fact or concept about earthquakes, plate boundaries, or geology in general that we have not talked about in class.

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The Process (part 4)

1. Go to google.com
2. Search TLC Earthquake Make a Quake

https://www.cosmeo.com/braingames/makeaquake/?title=Make%20a%20Quake

3. Click on the first link titled TLC: Earthquake: Make a Quake
4. Complete the chart below by selecting the **BEST Prevention** for each type of GROUND (incident).
5. Then write a brief synopsis of the AFTERMATH or outcome.

Your choices:

GROUND

1) STABLE, SOLID GROUND
    a. This seems the safest, but in a quake-prone area, all construction is a calculated risk.
2) FAULT ZONE
    a. Building along a fault zone has its risks but is often unavoidable.
3) LOOSE, GRAVELY SOIL.
    a. Prepare to go deep for support.
4) COASTAL GROUND AREA
    a. When near water, these are many dangers to consider.

PREVENTION:

1) Reinforced building
    a. Materials give concrete and masonry structures more tensile strength.
2) Foundation Anchoring
    a. Keeps a structure and its base moving as a unit when the ground begins to quake.
3) Base isolation
    'a. This allows a structure's foundation and the ground to move as one, minimizing the forces on the building itself
4) Pile Foundations
    a. This reaches down through unstable soil to the bedrock beneath for added stability.

MAGNITUDE:

1. Tremor - a minor quake of magnitude 2 to 4.9 rarely causes more than minor damage.
2. Quake - at magnitude 5 to 6.9 not the "Big One," but damage and injuries are to be expected.
3. Super quake - at magnitude 7.0 to 9.5, these are the monster quakes. Expect heavy losses in populated areas.

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NAME: **DATE:** **PERIOD:**

Circle the BEST prevention for each ground listed and for each magnitude

GROUND:	***PREVENTION***	***MAGNITUDE:***	***AFTERMATH***
Stable	1 2 3 4	Tremor	
Fault zone	1 2 3 4	Tremor	
Loose, gravely soil	1 2 3 4	Tremor	
Coastal ground area	1 2 3 4	Tremor	
Stable	1 2 3 4	Quake	
Fault zone	1 2 3 4	Quake	
Loose, gravely soil	1 2 3 4	Quake	
Coastal ground area	1 2 3 4	Quake	
Stable	1 2 3 4	Super quake	
Fault zone	1 2 3 4	Super quake	
Loose, gravely soil	1 2 3 4	Super quake	
Coastal ground area	1 2 3 4	Super quake	