

Cascadia: The Hidden Fire **STUDY GUIDE Q&A Sheet**

1. Cascadia will rattle an area 700 miles long from northern California to southern British Columbia.
2. On May 18 (1980), Mt. Saint Helens exploded with the force of 27,000 atom bombs. It flattened enough trees to build a half million homes; killed 57 people; sent a plum of ash around the earth, and gouge out a crater 2,000 feet deep and more than a mile wide.
3. It's not a question of if, but of when the next "big one" strikes
4. The Pacific Rim is known as the Ring of Fire, and is nearly 20,000 miles long.
5. March 27, 1964. The second largest earthquake ever recorded, the Anchorage quake, measured 9.2 magnitude. Violent shaking lasted up to five minutes and rattled people 1,000s of miles away. Hundreds of mudslides ripped out roads, bridges, and railroad tracks. In some places more than fifty foot tsunamis struck the coast. More than 130 people lost their lives. Entire forests died when submerged by salt water, and the ground shook so hard that it turned into quicksand, causing roads and bridges to collapse.
6. Cascadia is flanked by a huge offshore fault more than 700 miles long called the Cascadia Subduction Zone.
7. (Atwater's discovery.) Every few centuries the surface of the marshes had suddenly plunged four to five feet. Salt water rushed in on top of what would have been dry land.
8. Based on the marsh evidence...concluded...Eighteen giant earthquakes have struck Cascadia over the past 7,000 years. On average that's once every 500 years.
9. Tsunami ready signs...Ocean Shores, Washington. Ten to fifty foot tall tsunamis may strike the coast for up to 8 hours.
10. (Tree rings) Atwater now knew the last Great Earthquake had occurred about 300 years ago, but he wanted a more precise date. Help came from Japan. The mystery tsunami...9 PM, January 26, 1700, magnitude 9. (The whole Subduction Zone ruptures in one giant earthquake; this was dubbed "The Instance of Terror hypothesis".)
11. A magnitude 9 is about 1,000 times more energetic than a magnitude 7 earthquake.
12. Cascadia is the one of the most seismically violent places on earth.

13. Oral traditions...Coastal Indians...warns future generations not to build villages where Crescent City stands today. Twelve people died in a tsunami from the 1964 Alaska earthquake....more than 1500 miles from Anchorage.
14. The stories that we have today are important...because they also help validate the scientific information. (Discussion on the "slow slip" theory.)
15. The Nisqually earthquake (6.8 m) was the costliest disasters in Washington State history. It buckled road ways, toppled chimneys, dislodged building facades, and nearly destroyed the dome of the State Capitol.
16. The Nisqually earthquake was centered 37 miles deep beneath the surface of the earth. Quakes like this struck Puget Sound in 1949 and 1965. They are known as Beniof quakes, after the scientist who first described them.
17. The Nisqually earthquake certainly was not the big one scientists say will occur when the Subduction Zone slips and causes continent sized chunks of earth to lurch and heave.
18. In a subduction zone earthquake, the shaking is likely to last 2 to 4 minutes.
19. Subduction and Beniof earthquakes are not Cascadia's only seismic worries. In the last decade, scientists have learned that the crust beneath every large city in the region is slashed with shallow faults.
20. When the Seattle [shallow crustal] fault ruptures again, it could cause damage as severe as the 1995 earthquake in Kobe, Japan, the most expensive natural disaster in human history.
21. The worst case for us...is the shallow crustal faults nearer to our urban centers. It's possible that Cascadia might get both at once...subduction zone & shallow fault earthquakes.
22. Ninety percent of the buildings that are in existence today are not capable of handling the code level forces that we demand of our new structures. Many of those buildings will likely collapse...[like] unreinforced masonry structures....
23. It's not a question of IF, it's a question of WHEN the big one is going to happen.
24. Scientists and business leaders are concerned that the Northwest economy will take a major blow from a large crustal or subduction zone earthquake. For example [Like Kobe, Japan] if the Seattle port couldn't function and Portland couldn't, business would go to ports in California.
25. "You are going to survive. Let's prepare...so that your quality of life [after the earthquake] will be good for you when the ground stops moving."