Review guide: R4 unit exam. Plate Tectonics and related (test date: Tues/Wed, Feb. 2,3)

From the film: <u>The wave that shook the world</u>, given a map of Sumatra and the surrounding region, be able to identify Java, Sumatra and Sri Lanka. Be able to answer questions about why and how the Tsunami formed (what plate tectonic event triggered it). Why is that some earthquakes generate Tsunamis and others do not? How to Tsunami waves fundamentally differ from 'regular' ocean waves? What kinds of technology does that part of the world lack which could have alerted various populations to the impending disaster? How large was the Earthquake which generated the Tsunami? What year did it happen?

Plate Tectonics: What are the three sources of heat which drive plate tectonics? What is the fundamental, fluid dynamic in the mantel which pushes plates around? When and why did plate tectonics start? Why wasn't it happening before this moment? What were oceans like before life evolved? How have they changed? What are biogeochemical cycles? How does Carbon cycle through Earth's crust, oceans, atmosphere and biosphere? How did the evolution of life on Earth affect the development of continents? What causes Seafloor spreading? Why does the age of the ocean floor change from one side to the other? Why is there no ocean floor older than an few hundred million years anywhere on Earth? (even though the Earth is over 4 billion years old). How is the ocean floor related to 'the mantle'). What are Prokaryotes and Eukaryotes? What is the difference between Zooplankton vs phytoplankton?

Rocks and Minerals: How are continental rocks different from oceanic rocks? How is Obsidian 'the same' as Basalt? Why does it look so different? What are the major minerals found in Granite? (quartz, mica, feldspar, Olivine) Be able to name the following compounds and know where we can find them, and how they are formed: CO_2, H_2O, H_2S, SiO_2, $CaCO_3$, O_2 and the following elements: Fe, Ca, K, H, Ni, Ca, Cl, Na. How do minerals compare to crystals compare to rocks? What's the difference? How is Granite different from Basalt? Why are there different kinds of granite? Where does the mineral Olivine form? What does it look like? What living creatures form Chalk and Quartz? What kinds of creatures are they? (what are the chemical formulas for Chalk and Quartz). What is Coal? Where does it come from?

Paleocene-Eocene Thermal Maximum. When did it happen and what caused it? How did the oceans change and how were they similar to the oceans before plate tectonics started? How did life in the oceans and land change and why? Why is it worth noting today?

General Chemistry: What is the Chemistry of photosynthesis? What is the chemistry of combustion? (using burning wood, as an example). What is required for dead plants, animals and other things to decomposition? What happens if conditions aren't right? How could 'the rocks in Oman' help to cool the planet? What mountains today are actively removing CO_2 from the Atmosphere?

Earthquakes: What is Liquefaction? What kinds of landscapes are likely to suffer from it? Why is it a concern to us during earthquakes? Where are the two, major faults in the SF Bay area? Could you draw them on a map of the Bay Area? How are S waves different from P Waves different from Love waves different from Raleigh Waves? How are transform faults different from subduction zones?

Why is the Earthquake in Kobe Japan significant to us here in the Bay Area? How big was it? When did it happen? What happened to the region's economy afterwards? Why? When did the Loma Preita Earthquake happen? How far away was it? How was the bay area affected by it? Why is it NOT a good predictor for what will happen in the bay area if (and when) the Hayward fault comes loose?

How much more energy is released in a magnitude 6 Earthquake compared to a Magnitude 5 Earthquake? How about a Magnitude 7 earthquake compared to a Magnitude 6?

How is California's water supply at risk (especially to central valley farmers and LA) if a large quake happens on the Hayward Fault? How did the Delta Islands form? Why are they especially 'at risk' in the event of a major earthquake? Why will it be so hard for people to get help in the bay area after a large, local earthquake? When did Earthquake Safety begin to be part of building codes for buildings? What kinds of buildings are 'most at risk' during a large earthquake? How long can people expect to be without water, food and natural gas after a large earthquake? Why are local freeways such as 101 through Sausalito 'at risk'? What would be 'the worst' time for the Earthquake to hit? Why? What would be 'the worst' seasons for the Earthquake to hit? Why?