

1. Where is the epicenter of an earthquake located?
2. What change in the Earth's surface causes a tsunami?
3. Why do some tsunamis get to be such tall waves when they reach the shoreline?
4. Thinking about a map of the Earth and its plates, where do most earthquakes occur?
5. What is the cause of most, if not all, earthquakes in the crust (i.e., shallow-focus earthquakes)?
6. What feature of Earth's interior are deep-focus earthquakes associated with?
7. How deep are the deepest earthquakes?
8. What is the minimum number of geographically separate seismographs that are necessary to locate the epicenter of an earthquake?
9. What does the time difference between the first arrival of P and S waves tell us about an earthquake?
10. What does the amplitude of the seismic signal recorded by a seismograph tell us about an earthquake, once the distance to the epicenter is known?
11. Seismic waves are said to be either body waves or surface waves. What is a body wave?
12. What is an example of a seismic body wave?
13. Of the three major flavors of earthquake waves (P, S and surface), which one does not travel (propagate) through a liquid?
14. Of the three major flavors of earthquake waves (P, S and surface), which one causes the most damage to buildings?
15. Of the three major flavors of earthquake waves (P, S and surface), which one is fastest and so arrives at a distant seismograph first?
16. Of the three major flavors of earthquake waves (P, S and surface), which one can travel through the interior of the Earth and propagate through liquid, solid and gas?
17. Of the three major flavors of earthquake waves (P, S and surface), which one has a particle motion that is perpendicular to the direction the wave propagates?
18. Of the three major flavors of earthquake waves (P, S and surface), which one has a particle motion that is parallel to the direction the wave propagates?
19. Imagine two buildings of similar construction: a green building with a foundation built on hard bedrock and a blue building with a foundation built on soft sandy deposits. Which building will be shaken more violently, with higher-amplitude seismic waves, during an earthquake?
20. When an earthquake shakes loosely-packed (unconsolidated) fine/medium-grained sandy material that is saturated with water, the grains tend to reorganize into a more tightly packed mass and the excess water is pushed upward. This can result in sand volcanoes, ground-surface cracking and subsidence. What is this process called?
21. What is the primary cause of human death and injury during an earthquake?
22. What is the primary tool that society uses to protect its citizens from death and injury due to earthquakes?
23. Is there a significant chance of an earthquake occurring in the next 500 years that would cause major damage in Los Angeles? ...Chicago? ...New York? ...Seattle? ...Dallas? ...Memphis? ...Salt Lake City? ...Waco?
24. What causes most fires that damage urban areas after an earthquake?
25. What is the name of the major plate-boundary fault in California?
26. Is California's major plate-boundary fault the only fault capable of producing large earthquakes in southern California?
27. How do we know that Earth has a core, given that we cannot drill a hole that deep?
28. How do we know that Earth has a liquid outer core?
29. How do we know that there are density variations in the mantle?
30. If you have two chunks of the mantle, both of which are the same composition and are under the same pressure (because they are at the same depth) but chunk A is hotter than chunk B, how will their densities compare with one another? Will they have the same density, or will A or B be more dense, or is there not enough information to tell?
31. Why is the Mercalli intensity scale useful?
32. What is the kind of information used to determine the Mercalli intensity of an earthquake in a given location?
33. If we define the energy difference between a Richter-style magnitude 1 earthquake and a magnitude 2 earthquake as equal to 30 screaming cheerleaders, what is the energy difference between a magnitude 5 earthquake and a magnitude 8 earthquake?