

Answer Key for Environmental Geology Lab 7

1. See Figure 1 - Generally divergent plate boundaries will correspond with mid-oceanic ridges and subduction zones and mountain ranges with convergent plate boundaries

2. Yes most volcanoes and earthquakes occur along active plate boundaries so they should overlap.

3. High Rhyolite - Medium Andesite - Low Basalt

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5.		Color	Eruptive Behavior
	Basalt	Dark	Gentle
	Andesite	Medium	Both Gentle and Violent
	Rhyolite	Light	Violent

6. See the following diagrams in textbook
Shield Volcano - pg. 257 - Fig. 8.5
Composite Cone - pg. 258 - Fig 8.7
Caldera Volcano - pg. 264 - Fig. 8.16

7. Hot spot - not along a plate boundary

8. Shield Volcano

9. Douching with water and construction of obstruction structures to divert the lava flow to less harmful channels

10. Circle the following on Figure 2.

Safest - Zones 7-9

Least Safe - Zones 1-4

11. Because these are areas currently protected by the local topography of the island.

12. Hot spot is stationary but the Pacific Plate is moving from southeast to northwest.

13. Pyroclastic clouds are hundred's of degrees hot and consist of volcanic ash that travels at hundred's of miles per hour.

14. Economic - can disrupt both ground and air transportation; Climatic - volcanic ash can block sunlight causing global cooling; Health - inhalation of ash can result in silicosis, a condition commonly referred to as black lung disease

15. Lahars can be cold or warm and travel in valleys; whereas pyroclastic flows are always hot and travel across the entire landscape - are not confined to valleys

16. The moisture content of the loose material on the volcano, its angle of repose governed by its topography and the geometry of the drainage system surrounding the volcano.

17. Lava flow is immediately around the summit; pyroclastic flow can travel outward in all directions for up to 20 km. Lahars can travel within stream valley for 10's km away from the volcanic summit

18. High Risk Towns – Armero; No risk towns – all others

19. Excessive carbon dioxide concentrations can be toxic; volatile acids can be emitted from volcanoes, which can be corrosive; Vog that can cause respiratory distress

20. Most of Texas except the southernmost part of the state

21. While Laredo would not be directly affected by this eruption the indirect affects would be severe, which includes global cooling that potentially could cause crop failures and mass starvation worldwide.

22.	Probability of Volcanism	Basis of Assessment
South Texas	None	Not located near plate boundaries or hot spot
Hawaiian Islands	Very High	Located on hot spot
Japan	High	Located on convergent plate boundary
Iceland	High	Located on divergent plate boundary

23. Since Japan has andesitic composite cones which can erupt violently and Hawaii has basaltic shield volcanoes that erupt gently it is more likely that violent volcanism will occur on Japan versus Hawaii.

24. Answers will vary

25. Since the Cascade Range is located above a subduction zone the present and potential future volcanic activity is significant.