Name: _____ **Date:** _____

Answer Key: Violent Volcanic Vents: What Lies Beneath 8th Grade Earth Science

Calculate tectonic trajectories and analyze seismic stress to predict where the next major crustal shift will likely occur.

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1. The Juan de Fuca Plate is currently being forced beneath the North American Plate. Which characteristic landform transition is the result of this specific subduction process?

Answer: B) The creation of a continental volcanic arc

Subduction of oceanic crust under continental crust creates high pressure and friction, leading to flux melting and the formation of a chain of volcanoes on the continent, such as the Cascade Range.

2. To determine the exact location of an earthquake's epicenter, seismologists must analyze the arrival time difference between ____ waves and S-waves from at least three different stations.

Answer: C) P (Primary)

P-waves travel faster than S-waves. The lag time between their arrivals allows scientists to calculate distance via triangulation.

3. Deep-focus earthquakes are more likely to occur at divergent boundaries than at convergent subduction zones.

Answer: B) False

Deep-focus earthquakes only occur at subduction zones where the lithosphere is pushed deep into the mantle (Wadati-Benioff zones); divergent boundaries produce shallow earthquakes.

4. Which of the following describes the 'Elastic Rebound Theory' used to explain the cause of earthquakes?

Answer: A) Plates snap back to their original shape after breaking along a fault

Elastic Rebound Theory states that rocks store energy as they are deformed until they reach a breaking point, releasing energy and snapping back toward their undeformed state.

5. The Aleutian Islands in Alaska were formed by an oceanic-oceanic convergent boundary, which typically creates a ____.

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Answer: C) Volcanic island arc

When two oceanic plates collide, one subducts under the other, melting and rising to form a curved chain of volcanic islands.

6. A stratovolcano (composite volcano) like Mount Pinatubo is characterized by explosive eruptions. This is primarily due to magma that is ____.

Answer: D) High in silica and high in gas content

High silica content increases viscosity (thickness), which traps gases. When the pressure finally overcomes the weight of the rock, an explosive eruption occurs.

7. The Moment Magnitude Scale is considered more accurate than the Richter Scale for measuring very large, distant earthquakes.

Answer: A) True

The Moment Magnitude Scale measures the total energy released based on fault displacement and rock stiffness, whereas the Richter scale often 'saturates' and fails to distinguish between very large events.

8. A ____ is a fast-moving, lethal flow of hot ash, gas, and rock fragments that can collapse down the side of a volcano during an eruption.

Answer: C) Pyroclastic flow

Pyroclastic flows travel at speeds over 100 mph and reach temperatures capable of incinerating anything in their path.

9. If you are studying a map showing the age of the seafloor, where would you expect to find the oldest oceanic crust?

Answer: B) At the furthest point away from a spreading center, near a trench

Seafloor spreading creates new crust at ridges; therefore, the oldest crust has had the most time to move away from the ridge toward subduction zones.

10. Tsunamis are caused by the vertical displacement of the seafloor, usually during a megathrust earthquake at a subduction zone.

Answer: A) True

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Tsunamis require a sudden change in the volume of the ocean basin, which happens when the seafloor moves up or down during an earthquake.