Name: _____ **Date:** _____

Answer Key: Could the Continents Connect? 6th Grade Tectonics Quiz

Beyond simple map-matching — students synthesize evidence of lithospheric recycling and the mechanics behind Earth's shifting crustal mosaics.

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1. Scientists find identical fossils of the Mesosaurus in both Brazil and South Africa. Which advanced geological concept best explains how these terrestrial organisms are now separated by 3,000 miles of ocean?

Answer: B) Plate kinematics and continental drift

Plate kinematics describes the motion of lithospheric plates; the distribution of Mesosaurus fossils serves as primary evidence that these landmasses were once joined in the supercontinent Pangaea.

2. The _____ process occurs at convergent boundaries where a denser oceanic plate sinks beneath a lighter continental plate, often recycling crust into the mantle.

Answer: C) Subduction

Subduction is the specific mechanism of 'crustal recycling' where the slab pulls down into the asthenosphere, leading to volcanic arc formation.

3. True or False: Paleomagnetism provides evidence for seafloor spreading because the iron-rich minerals in basalt align with Earth's shifting magnetic poles as magma cools.

Answer: A) True

Magnetic 'striping' on the ocean floor acts as a historical record, proving that new crust is being created at divergent ridges and pushing older crust away.

4. While most volcanoes form at plate boundaries, the Hawaiian Island chain was created by a 'Hot Spot.' What does this suggest about the relationship between the lithosphere and the mantle?

Answer: B) The lithospheric plate moves over a stationary mantle plume.

The age progression of the islands shows that as the Pacific Plate moves northwest, the stationary mantle plume creates a sequence of new volcanic islands.

5. The _____ is the exact point inside the Earth's crust where an earthquake originates, while the point directly above it on the surface is the epicenter.

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Answer: C) Focus

The focus (or hypocenter) is the location within the Earth where the rupture begins and seismic energy is first released.

6. True or False: Tectonic plates move at approximately the same rate as human fingernails grow, roughly 2 to 10 centimeters per year.

Answer: A) True

This is a standard scientific comparison to illustrate the slow, steady pace of convection-driven plate movement over geological time.

7. Which type of seismic wave is considered a 'longitudinal' wave that travels fastest and can move through both solid and liquid layers of the Earth's interior?

Answer: C) P-waves (Primary)

P-waves are 'push-pull' waves that compress and expand the ground; their ability to travel through the liquid outer core is what allowed scientists to map Earth's internal layers.

8. Volcanoes like Mt. St. Helens are often explosive because their magma has high _____, meaning it is thick, sticky, and traps gas easily.

Answer: B) Viscosity

Viscosity is a fluid's resistance to flow. High-viscosity (rhyolitic or andesitic) magma leads to more violent eruptions compared to low-viscosity basaltic lava.

9. If you are exploring a transform boundary, such as the North Anatolian Fault in Turkey, what geological feature are you most likely to encounter?

Answer: C) Frequent earthquakes without volcanic activity

Transform boundaries involve plates sliding horizontally; since there is no subduction or rifting, crust is neither created nor destroyed, resulting in seismic activity but rarely volcanoes.

10. True or False: The 'Ring of Fire' is a direct result of divergent plate boundaries circling the Atlantic Ocean.

Answer: B) False

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The Ring of Fire is located around the Pacific Ocean and is primarily caused by convergent boundaries (subduction zones), not divergent boundaries.