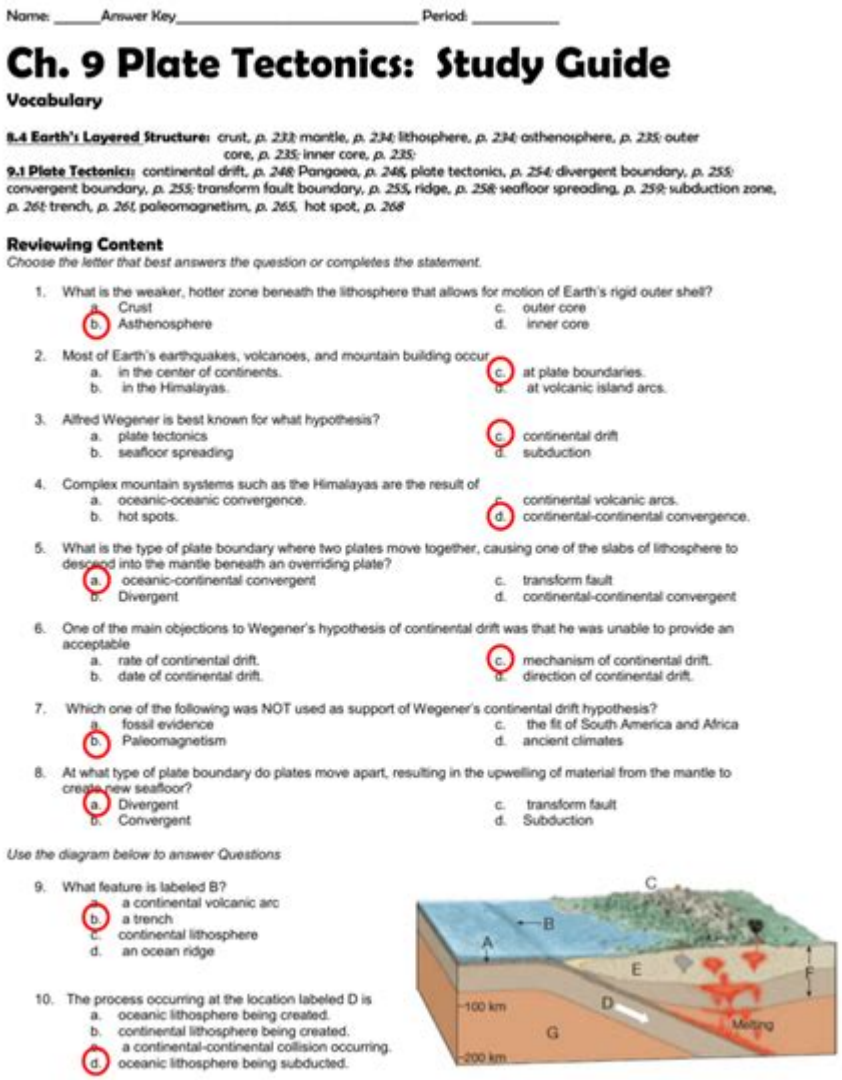
Plate Tectonics Questions Answer Key



Name: _____Answer Key_____ Period: _____

Ch. 9 Plate Tectonics: Study Guide

Vocabulary

8.4 Earth's Layered Structure: crust, *p. 233*; mantle, *p. 234*; lithosphere, *p. 234*; asthenosphere, *p. 235*; outer core, *p. 235*; inner core, *p. 235*;
9.1 Plate Tectonics: continental drift, *p. 248*; Pangaea, *p. 248*, plate tectonics, *p. 254*; divergent boundary, *p. 255*; convergent boundary, *p. 255*; transform fault boundary, *p. 255*, ridge, *p. 258*; seafloor spreading, *p. 259*; subduction zone, *p. 261*; trench, *p. 261*; paleomagnetism, *p. 265*, hot spot, *p. 268*

Reviewing Content

Choose the letter that best answers the question or completes the statement.

1. What is the weaker, hotter zone beneath the lithosphere that allows for motion of Earth's rigid outer shell?
   a. Crust
   b. Asthenosphere
   c. outer core
   d. inner core

2. Most of Earth's earthquakes, volcanoes, and mountain building occur
   a. in the center of continents.
   b. in the Himalayas.
   c. at plate boundaries.
   d. at volcanic island arcs.

3. Alfred Wegener is best known for what hypothesis?
   a. plate tectonics
   b. seafloor spreading
   c. continental drift
   d. subduction

4. Complex mountain systems such as the Himalayas are the result of
   a. oceanic-oceanic convergence.
   b. hot spots.
   c. continental volcanic arcs.
   d. continental-continental convergence.

5. What is the type of plate boundary where two plates move together, causing one of the slabs of lithosphere to descend into the mantle beneath an overriding plate?
   a. oceanic-continental convergent
   b. Divergent
   c. transform fault
   d. continental-continental convergent

6. One of the main objections to Wegener's hypothesis of continental drift was that he was unable to provide an acceptable
   a. rate of continental drift.
   b. date of continental drift.
   c. mechanism of continental drift.
   d. direction of continental drift.

7. Which one of the following was NOT used as support of Wegener's continental drift hypothesis?
   a. fossil evidence
   b. Paleomagnetism
   c. the fit of South America and Africa
   d. ancient climates

8. At what type of plate boundary do plates move apart, resulting in the upwelling of material from the mantle to create new seafloor?
   a. Divergent
   b. Convergent
   c. transform fault
   d. Subduction

Use the diagram below to answer Questions

9. What feature is labeled B?
   a. a continental volcanic arc
   b. a trench
   c. continental lithosphere
   d. an ocean ridge

10. The process occurring at the location labeled D is
    a. oceanic lithosphere being created.
    b. continental lithosphere being created.
    c. a continental-continental collision occurring.
    d. oceanic lithosphere being subducted.

Plate tectonics questions answer key provide essential insights into the dynamic processes that shape our planet. Understanding plate tectonics is crucial for comprehending geological phenomena such as earthquakes, volcanic eruptions, and the formation of mountain ranges. This article aims to address common questions related to plate tectonics, offering detailed answers that clarify this fundamental geological theory.

What is Plate Tectonics?

Plate tectonics is the scientific theory that explains the movement of the Earth's lithosphere, which is divided into several large and small tectonic plates. These plates float on the semi-fluid asthenosphere beneath them. The interactions between these plates are responsible for many geological features and events.

Key Concepts of Plate Tectonics

1. Lithosphere and Asthenosphere:
- The lithosphere includes the crust and the uppermost mantle, forming a rigid layer.
- The asthenosphere is a semi-fluid layer beneath the lithosphere, allowing the plates to move.

2. Tectonic Plates:
- Major plates include the Pacific Plate, North American Plate, Eurasian Plate, African Plate, South American Plate, Antarctic Plate, and Indo-Australian Plate.
- Minor plates include the Nazca Plate and the Cocos Plate.

3. Plate Boundaries:
- Divergent Boundaries: Plates move apart, leading to the formation of new crust (e.g., mid-ocean ridges).
- Convergent Boundaries: Plates collide, resulting in subduction zones or mountain building.
- Transform Boundaries: Plates slide past one another, causing earthquakes (e.g., San Andreas Fault).

Common Questions About Plate Tectonics

1. What evidence supports the theory of plate tectonics?

Several lines of evidence support the theory of plate tectonics:

- Fossil Distribution: Similar fossils found on different continents indicate they were once connected.
- Geological Features: Mountain ranges and earthquakes align along plate boundaries, demonstrating their movement and interaction.
- Seafloor Spreading: The discovery of magnetic striping on the ocean floor supports the idea of new crust formation at divergent boundaries.
- Paleomagnetism: Studies of ancient magnetic fields preserved in rocks show how continents have moved over geological time.

2. How do tectonic plates move?

Tectonic plates move due to the convection currents in the Earth's mantle. These currents are caused by the heat from the Earth's core, creating a cycle of rising and sinking material that drives the plates.

1. Convection Currents:
- Hot mantle material rises toward the surface.
- As it cools, it sinks back down, creating a continuous cycle.

2. Slab Pull and Ridge Push:
- Slab Pull: As a tectonic plate subducts, it pulls the trailing plate along with it.

- Ridge Push: New material formed at mid-ocean ridges pushes older material away, causing the plates to move apart.

3. What are the different types of plate boundaries?

Plate boundaries can be categorized into three main types, each with distinct geological activities:

- Divergent Boundaries:
- Characterized by the creation of new crust.
- Example: Mid-Atlantic Ridge.

- Convergent Boundaries:
- Can lead to mountain formation or subduction.
- Example: Himalayas (continental-continental) and the Mariana Trench (oceanic-continental).

- Transform Boundaries:
- Plates slide past each other causing friction and earthquakes.
- Example: San Andreas Fault in California.

4. How do plate tectonics contribute to natural disasters?

Plate tectonics are the underlying cause of many natural disasters, including:

- Earthquakes: Most earthquakes occur along fault lines at transform boundaries due to the friction between sliding plates.
- Volcanic Eruptions: Often occur at convergent boundaries where one plate subducts beneath another, causing magma to rise.
- Tsunamis: Can result from underwater earthquakes or volcanic eruptions, displacing large volumes of water.

The Impact of Plate Tectonics on Earth's Surface

Plate tectonics significantly influences the Earth's landscape, leading to various geological features and processes.

1. Mountain Building

Mountain ranges form primarily through the collision of tectonic plates at convergent boundaries. Notable examples include:

- The Himalayas, formed by the collision of the Indian and Eurasian plates.
- The Andes, created by the subduction of the Nazca Plate beneath the South American Plate.

2. Oceanic Features

The ocean floor is shaped by tectonic activity, resulting in features such as:

- Mid-Ocean Ridges: Underwater mountain ranges formed by divergent boundaries.
- Trenches: Deep valleys in the ocean floor formed by subduction zones, like the Mariana Trench.

3. Earthquake Zones

Certain regions are more prone to earthquakes due to their proximity to tectonic boundaries. For instance:

- The Pacific Ring of Fire, which encircles the Pacific Ocean, is a hotspot for seismic activity due to the numerous plate boundaries in the area.

The Future of Plate Tectonics

As plate tectonics continues to shape the Earth, scientists study its processes to predict future geological events and understand Earth's evolution.

1. Monitoring Tectonic Activity

Geologists use various methods to monitor tectonic activity, including:

- Seismographs: Instruments that record seismic waves from earthquakes.
- GPS Technology: Used to measure the movement of tectonic plates over time.

2. Understanding Climate Impacts

The movement of tectonic plates also affects global climate patterns by altering ocean currents and atmospheric conditions. For example, the uplift of mountain ranges can influence rainfall patterns and temperature distributions.

Conclusion

The theory of plate tectonics is a cornerstone of modern geology, providing insight into the processes that shape our planet. By understanding the movement of tectonic plates and their interactions, we can better predict natural disasters, recognize the formation of geological features, and appreciate the dynamic nature of Earth. This knowledge not only enhances our comprehension of geological phenomena but also informs our response to the challenges posed by these natural

events. As research continues, the study of plate tectonics will remain vital for both scientific inquiry and practical applications in disaster preparedness and environmental management.

Frequently Asked Questions

What are the main layers of the Earth involved in plate tectonics?

The main layers involved in plate tectonics are the lithosphere (which includes the crust and the upper mantle) and the asthenosphere (the semi-fluid layer beneath the lithosphere).

How do tectonic plates move?

Tectonic plates move due to convection currents in the mantle, driven by the heat from the Earth's core. This movement can cause plates to collide, pull apart, or slide past each other.

What are the three main types of plate boundaries?

The three main types of plate boundaries are convergent boundaries (where plates collide), divergent boundaries (where plates move apart), and transform boundaries (where plates slide past each other).

What geological features are commonly associated with convergent plate boundaries?

Convergent plate boundaries are commonly associated with mountain ranges, deep ocean trenches, and volcanic arcs.

What is the significance of the Ring of Fire in plate tectonics?

The Ring of Fire is a major area in the basin of the Pacific Ocean where many earthquakes and volcanic eruptions occur, due to the numerous subduction zones and tectonic plate boundaries surrounding the Pacific Plate.

Plate Tectonics Questions Answer Key

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