

I. Continental Drift

- A. During the _____ accurate maps of Earth were first developed.
- B. People noticed the continents could have fit together.
 - a. 400 years ago—Dutch map maker _____ noted the similarities in the coastlines between _____ and _____.
- C. 1912—Alfred Wegener (VEG nur)—proposed the _____.

II. Pangea

- A. All continents were once joined & broke up _____.
- B. This land mass was called – Pangaea.
- C. What does the word Pangea mean?

III. Clues to Continental Drift

- A. Puzzle like fit
- B. Fossil Clues
 - a. *Mesosaurus*—_____
 - i. Fossils were found in South America & Africa.
 - ii. Unlikely that Mesosaurus swum between the continents.
 - iii. How do they believe the fossils ended up on both continents?
 - b. *Glossopteris*—_____
 - c. Found in:
 - i.
 - ii.
 - iii.
 - iv.
 - v.
 - d. It was believed that when connected they had similar climate.
- C. Paleoclimatic Clues
 - a. Fossils of warm-weathered plants have been found in arctic regions
 - i. For example the Island of _____
 - b. Glacial deposits & surfaces scoured & polished by glaciers found around equator
 - i.
 - ii.
 - iii.
 - iv.
 - c. Parts of these continents were covered with glaciers.
 - d. Ancient coral reefs found in _____
- D. Rock Clues
 - a. Similar rocks are found on different coasts.

- b. Ex. Appalachian Mountains similar to rocks of _____ & _____.
 - c. Ex. Rocks of western Africa similar to rocks of _____.
 - E. Why was the theory of continental drift rejected at the time it was proposed?
 - F. Why would this theory later be accepted?
 - G. Computer Models of Continental Drift
 - a. Permian Period: 225 mya
 - b. Triassic Period: 200 mya
 - c. Jurassic Period: 135 mya
 - d. Cretaceous Period: 65 mya
 - e. Present Day: Today

II. Sea Floor Spreading

- a. Clues on the Ocean Floor
- b. Technology lead to further clues.
 - i. _____
 - ii. 1940's-1950's on ships
- c. What did these devices discover?
 - i. D
 - ii.
- d. **Scientists wondered what formed the Mid Ocean Ridge.**
- e. When was this theory proposed?
- f. Who proposed this theory?
- g. What exactly did he proposed caused sea floor spreading?
 - i. Hot (_____) material in mantle.

- ii. Forced _____ at mid-ocean ridge.
- iii. Flows _____, carries seafloor _____.
- iv. It cools, becomes more _____
- v. As it sinks, forms _____.

III. Glomar Challenger

- a. Research ship, '68
 - 1. Drilling Rig to obtain rock samples
 - 2. What was found?
- b. Note: some continental rocks are 4 billion years old.
- c. **Why are the seafloor rocks so young?**
- d. Rocks close to the ridges are younger.

IV. Magnetic Clues

- a. Basalt
 - 1. Rock samples collected from seafloor.
 - 2. Contains what ore?
- b. Aligns itself according to _____.
- c. Rock samples show several _____.
- d. _____--Instrument, which records magnetic data.
- e. What did this instrument find?

V. Theory of Plate Tectonics

- a. What is the theory of plate tectonics?
- b. What are plates?

- a. Lithosphere—100 km thick layer.
- b. Less Dense than the layer below.
- c. _____—the plates move around above this layer.
- c. Plate boundaries
 - a. PLATE BOUNDARIES--Divergent Boundaries (moving apart)
 - b. What are two examples of a divergent boundaries?

 - c. PLATE BOUNDARIES--Convergent Boundaries
 - 1. 3 Types
 - a. Subduction Zone
 - i. What is a subduction zone?

 - ii. Compare their densities

 - iii. What happens to the more dense plate?

 - iv. What is an example?
 - b. Ocean-Ocean Collisions
 - i. Same as subduction zone, but with *ocean plates*
 - ii. What is an example?
 - c. Two *continental plates* collide
 - i. Both are less dense than asthenosphere
 - ii. Usually NO subduction
 - iii. What happens when they collide?

 - iv. What is an example?
- d. PLATE BOUNDARIES—Transform plate boundaries
 - 1. 2 plates *slide* past one another.
 - 2. Can move in the same direction. OR
 - 3. Opposite directions.
 - 4. What are two examples?

VI. Plate tectonics

- a. Hypothesize: similar to the process of heating your home.
- b. How do convection currents form?

VII. What are the effects of plate tectonics?

a. _____

b. _____

c. _____

d. _____

e. _____