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Experiment: Sea - floor Spreading
(E. Science 9-10-2b)

Purpose: To illustrate how magnetic evidence helps support the sea- floor spreading theory.

Materials: metric ruler paper tape small magnetic compasses (2) bar magnet pen or marker

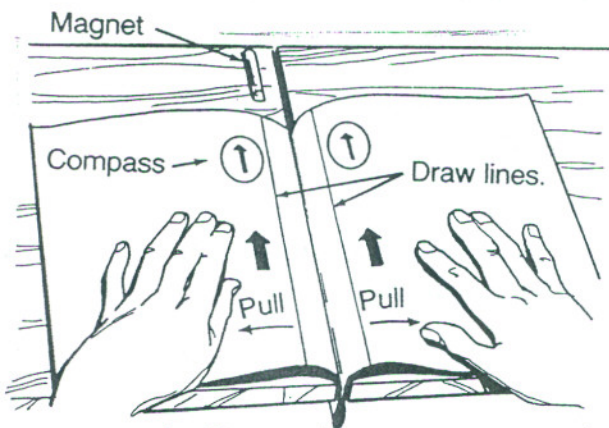
Methods:

1. Tape several sheets of paper together to produce a strip from 40 to 60 cm in length.
2. Fold the strip of paper and place it between two close desks or piles of books as shown in the figure. The paper represents oceanic crust on either side of a mid - ocean ridge.
3. Place the magnet as shown.
4. Place the two compasses next to each other on either side of the space between the desks.
5. Draw a line along each side of the space to represent the edges of the ocean ridge.
6. Beside the line, draw arrows showing the direction the compass needles are pointing.
7. Split the "seafloor" by moving the paper away from the center approximately 3 cm on each side.

Reverses the magnet by turning it 180 °.

8. Return the compasses to their original positions along the side of the space between the desks. Draw new arrows on the paper to represent the direction that the compass needles are now pointing.
9. Repeat this procedure several times. Sketch the results of the group in your results section of this lab.

Results:



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Experiment: Plate Tectonics - The Puzzle of the Continents (E. Science 9-11-3b)

Materials: Video: Plate Tectonics - The Puzzle of the Continents (Science 16)

Methods & Results: Answer question as you come across them in the video.

1. What did Alfred Wegener think back in 1911?
2. How did people back in 1911 think of continental drift?
3. Where did Alfred Wegener tragically die in 1930?
4. What is the greatest scientific theory of the 20th century?
5. What are three of Wegener's evidences for plate tectonics?
 - a.
 - b.
 - c.
6. What is the name of the giant continent that was theorized to exist on the south pole?
7. What is the mechanism for how continental plates move?
8. How did oceanographers in the 1950's map the ocean floor?
9. What is the name for the ridge of underwater mountains in the middle of the Atlantic Ocean?
10. What two modern evidences are there for plate tectonics?
11. How many major tectonic plates are there in the lithosphere?
12. What are the Plates usually named after?
13. What do the arrows on the plates indicate?

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14. Draw a sketch of the three types of plate boundaries, use arrows to indicate movement of plates. **(Continue with the rest of the question as we discuss each of these types of boundaries).**

Divergent Boundary

Transform Boundary

Convergent Boundary

15. How fast are the continents moving apart?

16. What is the driving force of plates?

17. What are the names of the two plates that split Iceland in half?

a.

b.

18. How has Iceland used the heat from the molten magma?

19. Draw convergent boundary for question 14.

20. What is the subduction zone?

21. What happens when the plates of equal densities collide?

22. Draw a transform plate boundary for question 14.

23. How far did the plates lurch forward during the San Francisco earthquake of 1989?

24. Describe how a hot spot works?

25a. We have just watched the video and have seen massive powers needed to cause plates to move. However, God's power is much much greater. Reread Eze. 38:20 and list each of the organisms that tremble in God's presence.

25b. Even though God is a powerful and (for the unsaved) a fearful God, God at the same time tries to comfort us. There are over 30 references in the Bible where He says "fear not". Read Isa 41:10, which is one of the passages that says fear not, and list some phrases He uses to reassure us so we can be less fearful?

25c. Also read Isa 43:1 and list some other phrases God used to comfort and encourage His people.