

Plate Tectonics: An Online Investigation

Please visit mrges.com, click on the “Labs” link, and then on the “Plate Tectonics Online Activity” link. When you arrive at the module, begin by clicking the “ENTER” button found on the bottom of the page. On the left hand side of the page, you will find the different topics that we will be exploring during this unit. Each section of this activity will correspond with each of the topics listed. Begin by reading the “INTRODUCTION”. When you have completed this brief reading, continue with the instructions below.

THE CONTROVERSIAL HYPOTHESIS

Begin by clicking on “THE CONTROVERSIAL HYPOTHESIS” link found on the topic list on the left of the page. Use the Information, images, and animations in the following pages to answer the questions below. Use the arrows on the bottom of the web page to navigate through this section.

1. What did Alfred Wegener’s theory of Continental Drift suggest?

2. What observation did Francis Bacon make that helped Wegener initially formulate the theory of Continental Drift?

3. How did observations of fossil Cynognathus, Glossopteris, Mesosaurus, and Lystrosaurus support the theory of Continental Drift?

4. What is the name of the Supercontinent that is thought to have existed during the Triassic Period?

5. How does evidence of ice sheets and glaciers further support Wegener’s theory? Explain.

6. What was the principal problem with Wegener’s theory? What did he suggest was happening?

7. What was the explanation, proposed by Arthur Holmes in 1928, that helped complete Wegener’s theory?

Name: _____ Date: _____ Period: _____

THE HYPOTHESIS BECOMES A THEORY

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8. What is the Mid-Atlantic Ridge?

9. Describe the pattern of rock age on either side of the Mid- Atlantic Ridge.

10. Describe the process that has been occurring over the past 140 million years to create the Atlantic Ocean. (Use slides 3, 4& 5 to answer this question).

11. What was discovered about sea-floor magnetism as a result of systematic measurements?

12. Use the next several slides to explain how these magnetic anomalies were formed.

13. Are volcanoes randomly arranged around the globe?

14. Are earthquakes randomly arranged around the globe?

15. What do you notice about the locations of the volcanoes and earthquakes around the globe?

16. What is the common model that scientists agreed on in the 1960”s?

THE DRIVING FORCE

Begin by clicking on “THE DRIVING FORCE” link found on the topic list on the left of the page. Use the Information, images, and animations in the following pages to answer the questions below. Use the arrows on the bottom of the web page to navigate through this section.

17. What is the driving force behind plate tectonics?

18. Describe how mantle materials move.

19. What causes the lithospheric plates to move?

20. What are the three types of plate motion?

CONVERGING PLATES

Begin by clicking on “CONVERGING PLATES” link found on the topic list on the left of the page. Use the Information, images, and animations in the following pages to answer the questions below. Use the arrows on the bottom of the web page to navigate through this section.

21. What happens when one oceanic plate and another oceanic plate collide?

22. What happens to the depth of the earthquake foci as one travels from east to west over the plate boundary?

23. What happens when an oceanic plate and continental plate collide?

24. What happens when one continental plate and another continental plate collide?

DIVERGING PLATES

Begin by clicking on “DIVERGING PLATES” link found on the topic list on the left of the page. Use the Information, images, and animations in the following pages to answer the questions below. Use the arrows on the bottom of the web page to navigate through this section.

25. What happens when two lithospheric plates move away from each other?

26. What is the driving force that causes these plates to separate?

27. What is the name of the layer in which magma forms?

28. In the second “Divergent Oceanic Plates- Mid-Ocean Ridges” slide, the magma solidifies and spreads from the mid-ocean ridge. Where would you expect to find the youngest rock?

29. At what rate is Iceland expanding?

30. When does a continental rift form?

TRANSFORM FAULTS

Begin by clicking on “TRANSFORM FAULTS” link found on the topic list on the left of the page. Use the Information, images, and animations in the following pages to answer the questions below. Use the arrows on the bottom of the web page to navigate through this section.

31. Describe the motion of plates that occurs along a transform fault.

32. What is considered the probably best-known fault in the world?

Name: _____ Date: _____ Period: _____

33. At what velocity does the Pacific Plate move relative to the North American Plate? _____

THE VELOCITY OF PLATES

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34. Generally speaking, where does hot spot volcanism take place?

35. As you travel from the island of Hawaii to the island of Kauai, what happens to the age of the land?

36. Based on the animation, describe how hot spot volcanism works.

37. Where on Earth are tectonic plates moving away from each other at the greatest speed? How fast?

Please view the plate tectonic reconstruction animation to see how the continents have moved over the past 440 million years. Read the summary to review your work.