

# DYNAMIC PLANET

November 4<sup>th</sup> Scrimmage



*Exploring the World of Science*

Name: \_\_\_\_\_

School: \_\_\_\_\_

Directions: DO NOT open the packet until prompted to. The test will be a 50 minute test and answer each question to the best of your abilities.

Total: \_\_\_\_\_/77

SECTION A: Multiple Choice (20 points total)

Directions: Circle the best answer(s) for each question

1. Incipient spreading was based upon the theory of seafloor spreading, proposed by: (1)
  - a) John Tuzo Wilson
  - b) Alfred Wegener
  - c) Arthur Holmes
  - d) Harry Hess
  - e) James Dwight Dana
  
2. In order from outside in, the earth is described mechanically by: (1)
  - a) Lithosphere, mantle, core
  - b) Crust, asthenosphere, mesosphere, inner core, outer core
  - c) Crust, mantle, core
  - d) Lithosphere, asthenosphere, mesosphere, inner core, outer core
  - e) Crust, lithosphere, asthenosphere, mesosphere, inner core, outer core
  
3. In a dip-slip fault: (1)
  - a) The hanging wall moves downward relative to the footwall, similar to that of a normal fault
  - b) The hanging wall moves downward relative to the footwall, similar to that of a reverse fault
  - c) The hanging wall moves up relative to the footwall, similar to that of a normal fault
  - d) The hanging wall moves up relative to the footwall, similar to that of a reverse fault
  
4. The Wilson cycle describes the opening and closing of ocean basins. Which of the following causes rifting? (1)
  - a) Two plates converge and begin creating new crust
  - b) A triple junction occurs as three plates converge
  - c) Slab pull causes a continental plate to subduct, causing a buildup of force that causes ridge push that forces continental breakup and rifting
  - d) Mantle plumes causes heating of plates and upward movement causes rifting
  - e) None of the above
  
5. In order from fastest to slowest, which shows the correct order of the velocity of seismic waves? (1)
  - a) Primary, raleigh, love, secondary
  - b) Secondary, love, primary, raleigh
  - c) Primary, secondary, love, raleigh
  - d) Primary, secondary, raleigh, love
  - e) Love, raleigh, secondary, primary
  - f) None of the above
  
6. Which mechanism is used to measure the intensity of an earthquake? (1)
  - a) Richter scale
  - b) Moment magnitude scale
  - c) Modified Mercalli scale
  - d) Rossi-forel Scale
  - e) None of the above
  
7. The oldest oceanic crust is thought to be remnant of the time of the formation of the Tethys Ocean, located in the: (1)
  - a) Red Sea

- b) Baltic Sea
- c) Mediterranean Sea
- d) Black Sea
- e) Bering Sea
- f) None of the above

8. The forces that causes deformation of rocks are: (1)

- a) Tensional stress
- b) Compressional stress
- c) Shear stress
- d) Strain
- e) All of the above
- f) C and D only

9. The Gutenberg discontinuity describes the: (1)

- a) Change in composition between the mesosphere and inner core
- b) Change in composition between the mantle and core
- c) Border between the inner core and outer core
- d) Seismic shadow zone
- e) None of the above

10. Molasse type sediment is normally found in which type of basin? (1)

- a) Forearc basins
- b) Foreland basins
- c) Back arc basins
- d) Rift basins
- e) Intermontane basins
- f) Trenches

11. The greatest danger of volcanoes are: (1)

- a) Lava flows
- b) Mud slides
- c) Landslides
- d) Lahar
- e) Pyroclastic flow
- f) None of the above

12. Yellowstone is an example of: (1)

- a) A hotspot
- b) A mantle plume
- c) A composite volcano
- d) A dormant volcano
- e) None of the above

13. What type of evidence did Wegener use to support his theory? (1)

- a) Distributions of fossil plants and animals
- b) Distributions of modern plants and animals
- c) Geographic fit of the continents and features

- d) Paleoclimatic oddities such as glacial till, coral reefs, and coal
- e) All of the above

14. What finally convinced geologists that the continents did move? (1)

- a) Dinosaur distributions
- b) *Lystrosaurus* in Antarctica
- c) Mantle convection
- d) Paleomagnetism
- e) The mid-ocean ridge

15. What is the age order of the sea floor types from oldest to youngest? (1)

- a) Abyssal hills, abyssal plain, mid-ocean ridge, continental shelf
- b) Abyssal plain, abyssal hills, mid-ocean ridge, continental shelf
- c) Continental shelf, abyssal plains, abyssal hills, mid-ocean ridge
- d) Mid-ocean ridge, abyssal hills, abyssal plains, continental shelf
- e) Mid-ocean ridge, abyssal plains, abyssal hills, continental shelf

16. Which sea is an example of rifting forming an incipient ocean? (1)

- a) Baltic Sea
- b) Bering Sea
- c) Black Sea
- d) English Channel
- e) Red Sea
- f) Mediterranean Sea

17. Which sea is a remnant of a larger ocean that has closed up? (1)

- a) Baltic Sea
- b) Bering Sea
- c) Black Sea
- d) English Channel
- e) Red Sea
- f) Mediterranean Sea

18. What is the east coast of the United States an example of? (1)

- a) Active continental margin
- b) Convergent plate boundary
- c) Divergent plate boundary
- d) Passive continental margin
- e) Transform plate boundary
- f) None of the above

19. What is the most viscous type of lava flow? (1)

- a) Aa
- b) Pahoehoe
- c) Pillow
- d) Pyroclastic
- e) Mud flow

20. Picritic magma has which of the following properties? (1)
- a) High temperature, medium gas content, low viscosity
  - b) Medium temperature, high gas content, high viscosity
  - c) Low temperature, low gas content, low viscosity
  - d) None of the above

SECTION B: Matching (16 points total)

Match the following words to the correct definition/related sentence.

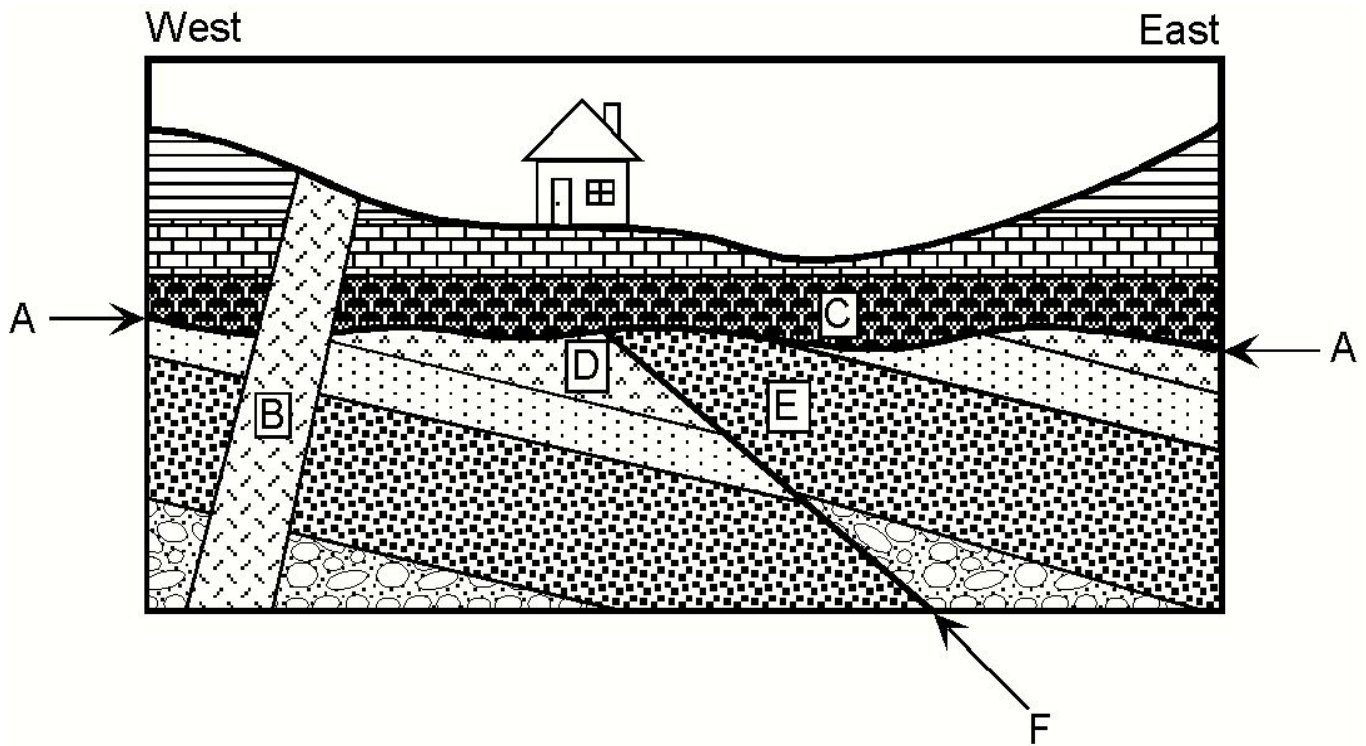
A. Alfred Wegener  
B. James Dwight Dana  
C. Arthur Holmes  
D. Allan Cox  
E. Orogenic belts  
F. Terranes  
G. Thrust fault  
H. Listric fault

I. Mass wasting  
J. Earth flow  
K. Trenches  
L. Mid-ocean ridges  
M. Cinder cone volcano  
N. Composite volcano  
O. Thrust earthquakes  
P. Strike-slip fault

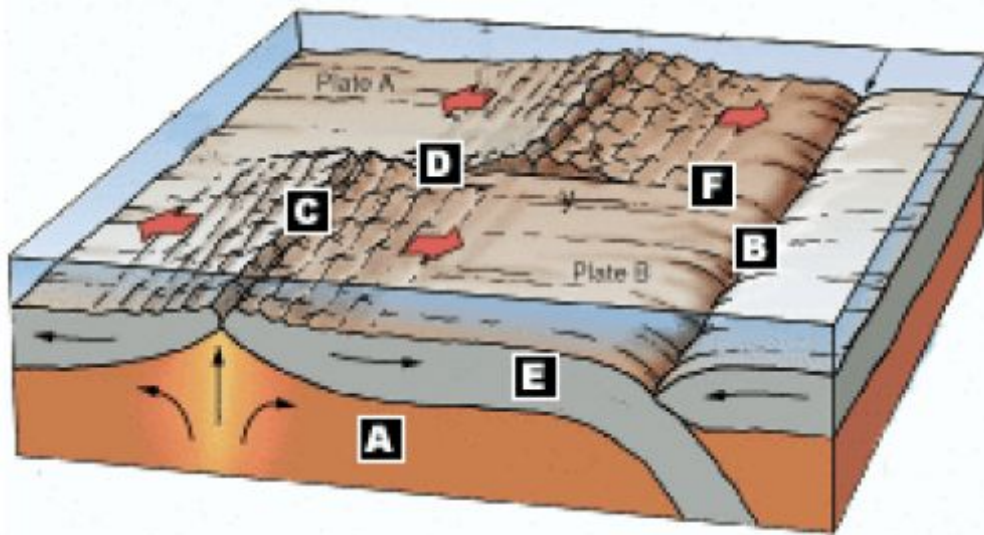
21. \_\_\_\_\_ Special movement of a normal fault (1)
22. \_\_\_\_\_ Mafic flows of magma (1)
23. \_\_\_\_\_ Slope movement (1)
24. \_\_\_\_\_ Studied geomagnetic reversals (1)
25. \_\_\_\_\_ Downhill movement of fine materials mixed with water due to gravity (1)
26. \_\_\_\_\_ Deepest points below sea-level (1)
27. \_\_\_\_\_ Type of reverse fault at a steeper angle (1)
28. \_\_\_\_\_ Contracting earth theory (1)
29. \_\_\_\_\_ Commonly found on flanks of other volcanoes (1)
30. \_\_\_\_\_ High viscosity lava flows of effusive eruptions (1)
31. \_\_\_\_\_ Sinistral or dextral movements (1)
32. \_\_\_\_\_ Form accretionary wedges (1)
33. \_\_\_\_\_ Traveled to Greenland to prove theory (1)
34. \_\_\_\_\_ Associated with convergent plate boundaries (1)
35. \_\_\_\_\_ Wrote *The Age of Earth* in 1913 (1)
36. \_\_\_\_\_ Structural deformation of lithosphere (1)

SECTION C: Diagrams (22 points)

37. Using the diagram below, order the age of the labeled areas from oldest to youngest (using letters - ex. A, B, C, etc) (6)

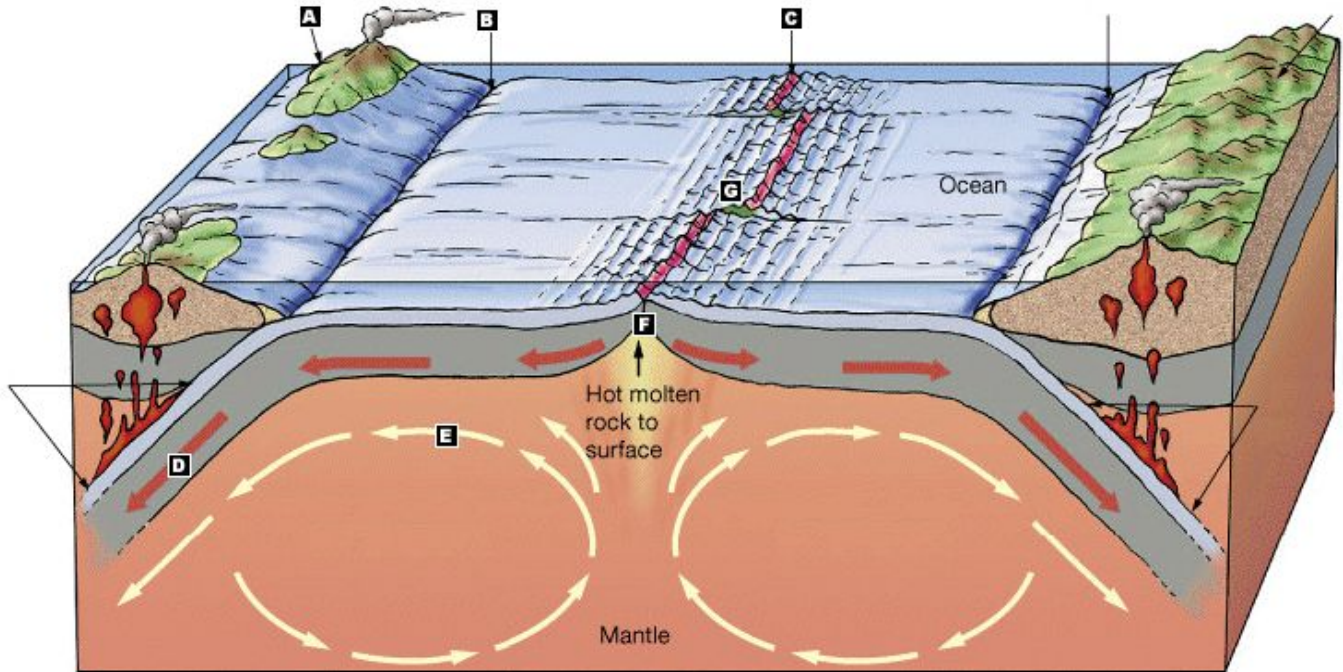


Using the image below, match the correct letter in the image with the features or statement, for questions 38-43. (6)



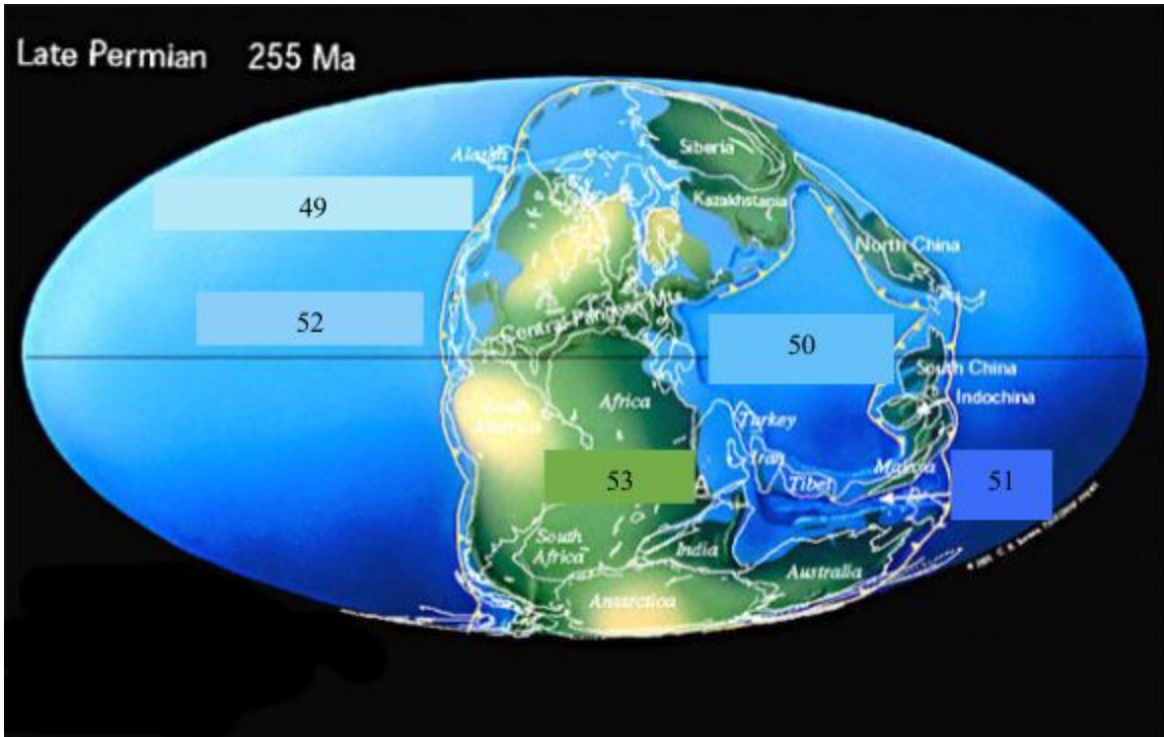
- 38. Fracture zone (1)
- 39. New crust is formed here (1)
- 40. Active transform fault (1)
- 41. Lithosphere (1)
- 42. Asthenosphere (1)
- 43. Trench (1)

Using the image below, match the correct letter in the image with the feature, for questions 44-48. Not all letter may be used (5)



- 44. Convection (1)
- 45. Subduction (1)
- 46. Mid-ocean ridge (1)
- 47. Volcanic arc (1)
- 48. Sea floor spreading (1)

Use the diagram below to label the following geological features on the map. (5)



49. \_\_\_\_\_ (1)



50. \_\_\_\_\_ (1)

51. \_\_\_\_\_ (1)

52. \_\_\_\_\_ (1)

53. \_\_\_\_\_ (1)

Section D: Short Answer (19 points)

54. Explain all the steps of the Wilson Cycle and include overall significance. (10 points)

55. Name and describe two discontinuities inside of the earth (cannot be Gutenberg Discontinuity) (4 points)

56. Describe mantle plumes and the impact on hotspots. (3 points)

57. What does a hypsometric curve demonstrate? (2 points)