Dynamic Planet Scrimmage Answer Key

77 points total

SECTION A: Multiple Choice (20 points total)

1. D (1)
2. D (1)
3. A (1)
4. D (1)
5. C (1)
6. A (1)
7. C (1)
8. E (1)
9. B (1)
10. B (1)
11. D (1)
12. A (1)
13. E (1)
14. C (1)
15. C (1)
16. E (1)
17. C (1)
18. D (1)
19. C (1)
20. D (1)

SECTION B: Matching (16 points total)

21. H (1)
22. L (1)
23. I (1)
24. D (1)
25. J (1)
26. K (1)
27. G (1)
28. B (1)
29. M (1)
30. N (1)
31. P (1)
32. F (1)
33. A (1)
34. O (1)
35. C (1)
36. E (1)

SECTION C: Diagrams (22 points)

37. E, D, F, A, C, B (1 point for each letter in right location - E first, F third, etc) 6 points total
38. F (1)
39. C (1)
40. D (1)

41. E (1)
42. A (1)
43. B (1)
44. E (1)
45. D (1)
46. C (1)
47. A (1)
48. F (1)
49. Panthalassic Ocean (1)
50. Paleo-Tethys Ocean (1)
51. Tethys Ocean (1)
52. Pangea (1)
53. Gondwana (1)

Section D: Short Answer (19 points)

54. 9 points total - answers do not need to be as specific as stated.
The Wilson Cycle describes the opening & closing of ocean basins explains how plates have moved over time, proving the theory of continental drift. (1)

Stage A: A Stable Continental Craton- a tectonically stable continental craton bordered by ocean basins and is in perfect isostatic equilibrium with no earthquakes or volcanic activity. (1)

Stage B: Hot Spot & Rifting- from deep in mantle a plume of hot mafic or ultramafic magma rises toward the surface & ponds at the base of the continent. This warms the continental crust and causes it to expand and swell, forming a dome. This thins the continental crust until the brittle surface cracks along a triple junction. (1)

Stage C: Creation of New Oceanic Crust: Early Divergent Margin- rifting systems are created to make a new ocean basin. (1)

Stage D: Full Divergent Margin- The continental crust has split into two, separated by the ocean and the center being a mid-oceanic ridge. There are now two continent, the east and west. (1)

Stage E: Creating a Convergent Boundary: Volcanic Island Arc Mountain Building- At some point, the divergence stops and the continents begin to move back together. Oceanic crust decouples & descends into the mantle along a subduction zone. This often forms volcanic arcs in the basin or near the continent. (1)

Stage F: Island Arc-Continent Collision Mountain Building- Westcontinent and the volcanic island arc have converged and collided, creating a large mountain and the remnant ocean basin is reduced to a suture zone. The east continent has a cross section and collision mountain building of island-arc continent collision and continent continent collision begin. (1)

Stage G: Cordilleran Mountain Eastcontinent & Westcontinent are being driven together as another subduction zone will begin to form another island arc. Destruction of crust continues under the edge of the Eastcontinent forming a Cordilleran (volcanic arc) type of mountain building. (1)

Stage H: Continent-Continent Collision Mountain building- the remnant ocean basin separating East & Westcontinents has closed & collided to form a Continent-Continent Collision Orogeny. (1)

Stage I: Stable Continental Craton- returns to Stage A. (1)

55. Any two of these are acceptable, each worth 2 points if fully explained in detail (4 points total)
1) 670 km Seismic Discontinuity - below LVZ where the seismic velocity increases, separating less dense upper mantle from more dense lower mantle (increase of depth changes crystalline structure)

2) Moho Discontinuity (crust and mantle) - seismic waves accelerate here and it is in between the crust and mantle

3) Lehman (Bullen) Discontinuity - (liquid outer core and solid inner core) change in composition since inner core composed of 85% iron and 18% nickel (solid)

56. Mantle plumes are thermal bulbous heads of hotter material than the surrounding, causes the plume to rise. When a plume head encounters the base of the lithosphere, it flattens out against the lithosphere and undergoes widespread decompression melting to form large volumes of basalt magma. It may then erupt onto the surface. (2) This is meant to explain the existence of hotspots as they do not occur at any plate boundaries. (1)

57. It is used to demonstrate that the Earth has two types of crust, continental & oceanic. (2)