

Scioly Summer Study Session 2020

Fossils

Test length: 16 stations

Suggested time: 3 minutes per station

Written by JasperKota – any questions feel free to PM me!

ANSWER KEY

Total points: 157

Tiebreaker points: 3

STATION 1: (7 pts)

Identify the genus of each fossil:

1. (A) **Mammut (mastodon) 1 pt**
2. (B) **Mammuthus (Mammoth) 1 pt**
3. **(C) Smilodon (saber-toothed cat) 1 pt**
4. (D) **Meshippus (three toed horse) 1 pt**
5. Which letter went extinct the latest? **__B 1 pt**
6. How has fossil B been commonly preserved, allowing preservation of soft tissue?
Frozen OR Mummification 1 pt
7. What does the genus of fossil D mean? **Middle horse 1 pt**

STATION 2: (6 pts)

8. Identify the order of G **Saurischia 1 pt**
9. What environment did fossil G live in? **Semiarid environment with distinct wet and dry seasons 1 pt**
10. What was the diet of fossil F? **Fish pt**
11. What time period did fossil F live in? **Early- Late Cretaceous 1 pt**
12. What time period did fossil E live in? **Cisuralian (Early Permian) 1 pt**
13. What is one hypothesized purpose of the spine sails of fossil E? **Stabilize its spine or to heat and cool its body as a form of thermoregulation or courtship display (accept either) 1 pt**

STATION 3: (12 pts)

- | | |
|------------------|------------------|
| 14. __G__ | 21. __C__ |
| 15. __D__ | 22. __L__ |
| 16. __F__ | 23. __H__ |
| 17. __I__ | 24. __A__ |
| 18. __K__ | 25. __J__ |
| 19. __B__ | |
| 20. __E__ | |

STATION 4: (7 pts) 1 pt per question

Identify and state the genus of each fossil:

26. Fossil H ***Acanthostega***

27. Fossil I ***Tiktaalik***

28. Fossil J ***Eryops***

29. Fossil K ***Diplocaulus***

30. Which letter is an important transitional fossil? **I**

31. Which letter is an anatomically intermediate between lobe-finned fishes and those that were fully capable of coming onto land? **K**

32. What was the diet of fossil H? **Fish**

STATION 5: (7 pts)

33. Which fossil could best be used as an index fossil?(W, X, Y, or Z) **W 1 pt**

34. List two characteristics of an index fossil:

Any of the following: Short vertical range, wide geographic distribution, rapid evolutionary trends, abundant, distinct, limited in geologic time (1 pt each)

35. State the best index fossil (L, M, or N) **L**

State which fossil each statement correlates with:

36. Also known as “butterfly shells” **___L___**

37. Widespread in Permian deposits **___M___**

38. Ate zooplankton for food, had structures called lacunae **___N___**

STATION 6: (12 pts)

39. List the strata in diagram in order from youngest to oldest (A-I):

B, C, D, E, A, H, F, G, I (9 pts)

40. What geological structure does A represent? **Unconformity**

41. Explain the law of superposition: **In any undisturbed sequence of rocks deposited in layers, the youngest layer is on top and the oldest on bottom, each layer being younger than the one beneath it and older than the one above it (1 pt)**

STATION 6 (cont.):

42. Explain the law of original horizontality: **Layers of sediment were originally deposited horizontally under the action of gravity. Any rock layers that are now folded and tilted have since been altered by later outside forces (1 pt)**

STATION 7: (10 pts)

List the five great mass extinctions in order: (1pt each)

43. (oldest) **Ordovician–Silurian extinction events (End Ordovician or O–S)**

44. **Late Devonian extinction**

45. **Permian–Triassic extinction event (“The Great Dying”)**

46. **Triassic–Jurassic extinction event**

47. (most recent) **Cretaceous–Paleogene extinction event (Aka K-Pg extinction)**

48. Describe the factors theorized to have led to the Late Devonian Extinction:

Environmental change specifically global anoxia, oxygen shortage was possibly triggered by global cooling or oceanic volcanism. (2 pts)

Identify fossil O and state which extinction event it died off in:

49. **Fusulinida (fusulinids) 1 pt**

50. **Permian-Triassic 1 pt**

50. What class was the only dinosaur lineage to survive the Cretaceous–Paleogene extinction event? **Aves (birds) 1 pt**

STATION 8 (10 pts)

Identify and state the genus of each fossil:

51. Fossil P ***Calamites***

52. Fossil Q ***Metasequoia***

53. Fossil R ***Annularia***

54. Fossil S ***Glossopteris***

55. Fossil T ***Lepidodendron***

56. Fill in the blank: Fossil **__R__** is the name given to the leaves of Fossil **__P__**

57. Which fossil is known as a “living fossil”? **__Q__**

58. Describe the historical importance of the distribution of Fossil S:

Glossopteris was found across several landmasses divided by large bodies of water, this distribution was used to help support the theory of continental drift. Helped support the idea of one supercontinent called Pangea. (2 pts)

STATION 9 (12 pts)

59. Describe the differences between rugose and tabulate corals: **Rugose corals have well developed septa and are bilaterally symmetrical whereas tabulate corals have weak or absent septa and are radially symmetrical (2 pts)**

Identify each fossil and state whether it is rugose, tabulate, or neither:

60. Fossil U **Heliophyllum**

Rugose

61. Fossil V **Septastraea**

Neither

62. Fossil W **Hexagonaria**

Rugose

63. Fossil X **Favosites**

Tabulate

64. Which fossil is also known as the Petoskey stone? (State a letter) ___**W**___

65. Which fossil is commonly found in Silurian limestone with a diet of zooplankton?

___**X**___

STATION 10 (10 pts)

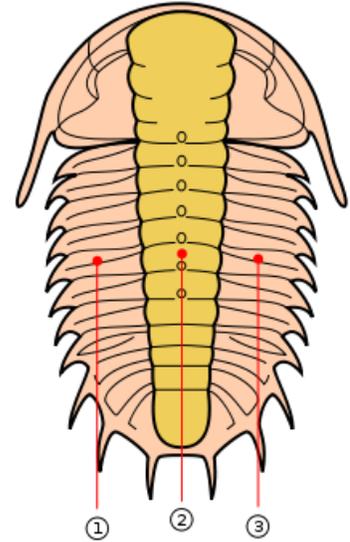
66. What geologic time period was also known as “The Age of the Trilobites”?

Cambrian 1 pt

67. In what geologic time period did trilobites go extinct?

Permian 1 pt

Name each anatomical structure of the diagram: (1 pt each)



68. (1) **Left pleural lobe**

69. (2) **Axial lobe**

70. (3) **Right pleural lobe**

71. Which fossil was almost completely blind? **C 1 pt**

72. Which fossil was the oldest trilobite? **A 1 pt**

73. Which fossil was formerly named phacops? **B 1 pt**

74. State the new name: **Eldredgeops 1 pt**

75. Which fossil was the largest trilobite ever found? **D 1 pt**

STATION 11 (8 pts) (1 pt tiebreaker)

76. State the common name of the class for fossil B: **Ray-finned fishes 1 pt**
77. Explain how the common name relates to the appearance and anatomy of the fossil: **Called ray-finned because their fins are webs of skin supported by bony or horny spines ("rays"), as opposed to the fleshy, lobed fins (1 pt)**
78. Identify fossil B: ***Knightsia* (1pt)**
79. State the order of fossil A: **Antiarchi (1pt)**
80. State the time period fossil A went extinct and why extinction occurred: **Late Devonian, at the end of the Devonian period from ecological catastrophes of the Devonian/Carboniferous extinction event NOT from competition (2 pts)**
81. What was the environment of fossil A? **Bottom-dweller of streams and akes. Some species lived in marine conditions (1 pt)**
82. (Tiebreaker) How many dermal layers of the skeleton did fossil A have? **3**
83. True or false: Fossil A was used as an index fossil **True**

STATION 12 (9 pts)

Describe the following growth forms:

84. **Branching** (where the structure forms intricate branches)
85. **Fenestrate** (where in life the bryozoan would have large, soft appendages coming out from the skeleton, built lace like structures for their homes.)
86. Massive: **A mound with no planned shape**
87. State the genus of fossil A: ***Archimedes***
88. What is the growth form of fossil A: **Fenestrate**
89. Describe the habitat of fossil A: **living in shallow marine waters, prefer clear water**
90. State the genus of fossil B: ***Rhombopora***
91. State the mode of life of fossil B: **Benthic**
92. State the geological time period of fossil B: **Carboniferous to the Permian**

STATION 13 (8 pts)

93. State two reasons why specimen A is an important tool for geologists:

Accept any of the following: Serve as excellent index fossils for the paleozoic, used to estimate water depth and temperature during the graptolites lifetimes, Experts can use graptolite fossils from a rock to tell how old it is (1 pt each reason)

94. Describe how specimen A ate grabbed and ate food: **Suspension feeder, fed by straining plankton and other pieces of food from the water, used cilia to grab food** (2 pts)

95. State the common mode of preservation in what rock type for specimen A:

Carbonization in shale (1 pt)

Identify specimen B, C, D, E, and F, **B - siltstone, C – sandstone , D - limestone, E - shale, F – Coquina**

96. B _____

97. C _____

98. D _____

99. F _____

STATION 14 (11 pts)

State which Dinosauria order each bone structure matches:

100. Bone structure 1:

Saurischia 1 pt

101. Bone structure 2:

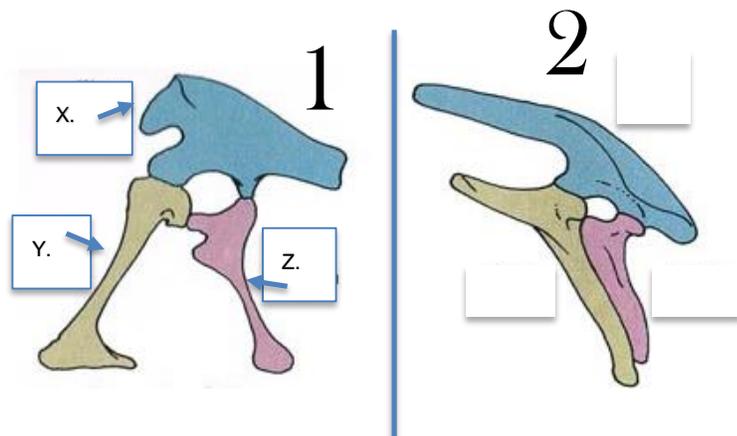
Ornithischia 1 pt

Label the following bones: 1 pt each

102. X **Ilium**

103. Y **Pubis**

104. Z **Ischium**



105. Identify fossil A: **Allosaurus 1 pt**

106. State hypothesized two functions of the horns on the lacrimal bone of fossil A: **Acting as sunshades for the eye, used in combat against other members of the same species 2 pts**

107. True or False: Fossil A is a rare fossil **False 1 pt**

108. Describe the environment of fossil B: **Arid with fields of sand dunes and intermittent streams. 1 pt**

109. How is fossil B distinguished from other dromeosaurids? **By long and low skull with an upturned snout. 1 pt**

STATION 15 (16 pts) 4 pts per question

For each fossil identify and state:

110. Fossil A **Dilophosaurus**

Habitat: **Lived near streams, rivers as well as other water sources**

Diet: **Carnivore, meat eater, potentially scavenger**

Geological time period: **Early Jurassic**

111. Fossil B **Coelophysis**

Habitat: **Floodplains marked by distinct dry and wet seasons**

Diet: **Carnivorous, preyed on small, lizard-like animals and insects**

Geological time period: **Late Triassic**

112. Fossil C **Smilodon**

Habitat: **Closed habitats such as forests and bush**

Diet: **Hunted large herbivores such as bison and camels. Apex predator**

Geological time period: **Pleistocene to Early Holocene**

113. Fossil D **Pterosauria**

Class: **Reptilia**

Diet: **Insects and fish**

Geological time period: **Late Triassic–Late Cretaceous**

STATION 16: (7 pts) (1 pt tiebreaker)

114. Which lagerstätte is fossil A commonly found in?

Solnhofen Limestone

115. Describe the historical importance of fossil A: **The discovery seemed to confirm Darwin's theories and has since become a key piece of evidence for the origin of birds, important as a transitional fossil and supports evolution. (1 pt for transitional fossil, 1 pt for evolution)**

116. State the time period of fossil A: **late Jurassic**

Identify each type of trace fossil (B-D):

117. B **Coprolite**

118. C **Tracks**

119. D **Burrow**

120. (Tiebreaker) State another name for trace fossil: **Ichnofossil**