**Standard 8Sb:** **The student will demonstrate an understanding of Earth’s biological diversity over time. (Life Science, Earth Science)** by using 1 or more of these suggestions. Written mastery may be demonstrated by keeping a science journal describing your activities. Be sure to give complete 5WH descriptions. (5WH = Who, What, Where, When, Why, and How) Oral mastery may be demonstrated by making a class presentation showing and telling about your science activity demonstrating your knowledge of the assigned words. In place of presenting in class, you may make a video recording, slideshow with pictures and voice over, or similar presentation and post it to Mr. Graham’s Webb Page.

1. Find any simple experiment involving fossils on the Internet for which you have the resources to do, ask Mr. Graham to approve it, and then do it. Be sure it has controlled all but 1 experimental variable. Be sure to keep careful 5WH journal notes of the questions you considered, researched, or investigated during your experiment.
2. Select 1 modern animal species. Research the recorded fossil record for its apparent progenitors and describe each of the major adaptations that advanced them toward what they are today. Tell the full 5WH for each adaptation found in the fossils of the animal’s progenitors. Include picture’s of the adaptations as much as possible.
3. Select a 1-quarter acre site containing no man-made structures near your home. Conduct as complete a count of all the different plants and animals that you can observe on your acre at 1 moment of time. Take as many pictures as needed to cover your quarter acre. Be sure to keep careful 5WH journal notes of the questions you considered, researched, or investigated during your quest to count and identify every living thing on your quarter acre.
4. Sign for a fossil from Mr. Graham’s collection. Identify the fossil. Keep complete notes on each guess you make and what resources you used to determine whether you are correct or not. Your conclusion should be a description of how you determined what the fossil is, where it can be found, who wrote the journal or book that confirmed your conclusion on the fossil’s identity, when the fossil was living (in what era or epoch did it live), why this fossil became extinct or why animals like it are still alive today.
5. *Essential Question:* How do adaptations help organisms survive?
6. *Essential Question:* What do different kinds of fossils tell us about Earth’s history?
7. *Essential Question:* How have catastrophes affected conditions on Earth?
8. *Essential Question:* How is geologic time divided into units?
9. *Essential Question:* How are changes of Earth’s organisms related to the geologic time scale?
10. *Essential Question:* How can you determine the relative age of rocks and fossils?

*7 Essential Question:* What natural and man-made factors can cause extinction of a species?

**Vocabulary:** These words must be understood well enough for you to describe your results in the demonstration(s) suggested above by the end of the quarter.

1. adaptation
2. asteroid
3. biological adaptations
4. carbonized
5. casts
6. catastrophes
7. comet
8. diverse/diversity
9. embryology
10. environment
11. epoch
12. era
13. evolution
14. factors
15. fossils
16. genus
17. geologic time scale
18. gradualism
19. hominid
20. homo Sapiens
21. homologous
22. index fossils
23. meteor
24. molds
25. natural selection
26. organisms
27. period
28. petrified
29. populations
30. preserved remains
31. primate
32. punctuated equilibrium
33. radioactive element
34. sedimentary rock
35. species
36. survival
37. trace fossils
38. variation
39. vestigial structure
40. volcanism

**Rubric:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **A = 4** | **B = 3** | **C = 2** | **D = 1** | **Score** |
| **Within the context of your project include answers to the essential questions within these parameters:** |  |
| Tell 🞏how you determined 🞏what your reported fossil is, 🞏where it can be found, 🞏who wrote the journal or book that confirmed your conclusion on the fossil’s identity, 🞏when the fossil was living (in what era or epoch or period did it live), 🞏why this fossil became extinct or 🞏why animals like it are still alive today. | Any 4 or 5 of the 6 parts in an “A” answer. | Any 2 or 3 of the 6 parts in an “A” answer. | Any 1 of the 6 parts in an “A” answer. |  |
| \* Include 4 fully described adaptations of your fossil or its apparent relatives telling how the adaptation helped the organisms survive? | Any 3 of the 4 parts in an “A” answer. | Any 2 of the 4 parts in an “A” answer. | Any 1 of the 4 parts in an “A” answer. |  |
| \* Describe how at least 4 different kinds of fossils tell us about Earth’s history? | Any 3 of the 4 parts in an “A” answer. | Any 2 of the 4 parts in an “A” answer. | Any 1 of the 4 parts in an “A” answer. |  |
| \* Describe 4 catastrophes which affected conditions on Earth either locally or worldwide? | Any 3 of the 4 parts in an “A” answer. | Any 2 of the 4 parts in an “A” answer. | Any 1 of the 4 parts in an “A” answer. |  |
| \* Explain how eons, eras, periods, and epochs divide geologic time into units? | Any 3 of the 4 parts in an “A” answer. | Any 2 of the 4 parts in an “A” answer. | Any 1 of the 4 parts in an “A” answer. |  |
| \* Give 4 changes of Earth’s organisms related to the geologic time scale? | Any 3 of the 4 parts in an “A” answer. | Any 2 of the 4 parts in an “A” answer. | Any 1 of the 4 parts in an “A” answer. |  |
| \* Give 3 methods used to determine the relative age of rocks and fossils? | Any 2 of the parts in an “A” answer. | Any 1 of the parts in an “A” answer. | Part of any 1 of the parts in an “A” answer. |  |
| \* List and describe 4 natural or man-made factors that may cause extinction of a species? | Any 3 of the 4 parts in an “A” answer. | Any 2 of the 4 parts in an “A” answer. | Any 1 of the 4 parts in an “A” answer. |  |
|  |  |  |  |  |
| Over 35 of 40 key words used correctly in SJ or Report | Over 31 of 40 key words used in SJ or Report | Over 26 of 40 key words used in SJ or Report | Over 23 of 40 key words used in SJ or Report |  |
| Science Journal (SJ) entries Complete including all 5WH | Science Journal (SJ) entries including only 4 of WH | Science Journal (SJ) entries including only 3 of WH | Science Journal (SJ) entries including only 2 of WH |  |
| Give the Kingdom, Phylum, Class, Order, Family, Genus, and Species of your fossil. | Give the Kingdom, Phylum, Class, Order, & Family of your fossil. | Give the Kingdom, Phylum, and Class of your fossil. | Give the Kingdom and Phylum of your fossil. |  |
| Give APA format sources for 90% or more of your report whether oral or written. | Give APA format sources for 80% or more of your report. | Give APA format sources for 70% or more of your report. | Give APA format sources for 60% or more of your report. |  |
| **\* Answer may be done as a separate 1 to 3 paragraph general report if it does not apply to your fossil identification project.****Your report grade is the average of all of the rows in this rubric.** |  |

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* casts
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