

General Course Information

Course Name: Fossils and the Story of Ancient Life	
Department: Science	Grade Level(s): 11,12
Duration/Credits: 1 Semester/0.5	Prerequisites: None
BOE Approval Date: 12/15/22	Course Code: H3180
Course Description:	
Fossils and The Story of Ancient Life allows the learner to examine life as it existed in the past through hands-on experiences. The student will develop skills for understanding the patterns of life of the past and how it affects life in the present. The student will use hands-on learning with dinosaur replica models, fossils, and rock specimens to understand the environments that existed in the past. The geologic time scale, fossils, geologic dating, and the origin of life are discussed.	
Course Rationale:	
Today, the job market demands advanced skills, requiring people to be able to learn new skills, use reason, think creatively, make decisions, and solve problems. An understanding of science and the processes of science contribute in an essential way to these skills.	
Course Objectives:	
1. The student will compare techniques used for geologic dating, and relate them to the reconstruction of the geologic time scale. 2. The student will compare the methods of fossil formation and determine the environmental conditions under which fossils may have formed. 3. The student will be able to research and explain the different types of paleontology. 4. The student will read about and examine fossils to identify the time period, in which they belong, and analyze the importance of "index fossils" in the Geologic time scale. 5. The student will be able to model and identify patterns in species evolution throughout time. 6. The student will be able to explain how Earth formed and changed to become habitable for life. 7. Students will be able to utilize dichotomous keys and cladograms to classify and make connections between different species. 8. The student will be able to explain how life has changed throughout geologic time	

(including identifying the major life forms that lived during the various time units).

9. The student will investigate, research, and present about a Paleozoic and Mesozoic animal that includes all aspects of the animal's morphology, life history, and its environment.

10. The students will be able to connect environmental changes and extinction events with changes of life on Earth.

Standards Alignment:

- 9-12.PS1.C.1 Use symbolic representations to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.
- 9-12.PS1.B.3 Use symbolic representations and mathematical calculations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.
- 9-12.LS2.A.1 Explain how various biotic and abiotic factors affect the carrying capacity and biodiversity of an ecosystem using mathematical and/or computational representations.
- 9-12.LS2.B.2 Communicate the pattern of the cycling of matter and the flow of energy among trophic levels in an ecosystem.
- 9-12.LS2.C.1 Evaluate the claims, evidence, and reasoning that the interactions in ecosystems maintain relatively consistent populations of species while conditions remain stable, but changing conditions may result in new ecosystem dynamics.
- 9-12.LS4.A.1 Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.
- 9-12.LS4.A.2 Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.
- 9-12.LS4.C.2 Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.
- 9-12.ESS1.C.2 Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history.
- 9-12.ESS2.E.1 Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.