8.6 Natural Selection and Common Ancestry

Content Area: **Science**
Course(s): **Science 8**
Time Period: **Marking Period 4**
Length: **20 days**
Status: **Published**

Established Goals/Standards

SCI.MS-LS4	Biological Evolution: Unity and Diversity
SCI.MS-LS4-4	Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.
SCI.MS-LS4-5	Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.
SCI.MS.LS4.B	Natural Selection
SCI.MS-LS4-6	Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.
SCI.MS.LS4.C	Adaptation

Technology Standards

TECH.8.1.8.C.CS1	Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media.
TECH.8.1.8.C.CS2	Communicate information and ideas to multiple audiences using a variety of media and formats.

NJ 21st Century Life and Careers/NJ Career Ready Practices

CAEP.9.2.8.B.3	Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

Interdisciplinary Connections

ELA/Literacy -

RST.6-8.1	Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. *(MS-LS4-1)*
RST.6-8.7	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). (MS-LS4-1)

Mathematics -

6.EE.B.6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. *(MS-LS4-*

Essential Questions

- How do differences between individuals and species' characteristics and behaviors enhance their fitness?
- How do we know when an organism (fossil) was alive?
- Other than bones and structures being similar, what other evidence is there that birds and dinosaurs are related?

Enduring Understanding

- Fossil records and anatomical similarities of the relationships among organisms and species describe biological evolution

Content

- The fossil record documents the existence, diversity, extinction, and change of many life forms throughout the history of life on Earth.
- The collection of fossils and their placement in chronological order as identified through the location of sedimentary layers in which they are found or through radioactive dating is known as the fossil record.
- Relative fossil dating is achieved by examining the fossil's relative position in sedimentary rock layers.
- Successive layers of sedimentary rock and the fossils contained in them tell the factual story of the age, history, changing life forms, and geology of Earth.
- Interpret a representation of a rock layer sequence to establish oldest and youngest layers, geologic events, and changing life forms.
- Objects and events in the fossil record occur in consistent patterns that are understandable through measurement and observation.
- Patterns exist in the level of complexity of anatomical structures in organisms and the chronological order of fossil appearance in rock layers.
- Patterns can occur within one species of organism or across many species.
- Similarities and differences exist in the gross anatomical structures of modern organisms.
- There are anatomical similarities and differences among modern organisms and between modern organisms and fossil organisms.
- Similarities and differences exist in the gross anatomical structures of modern organisms and their fossil relatives.
- Similarities and differences in the gross anatomical structures of modern organisms enable the reconstruction of evolutionary history and the inference of lines of evolutionary decent.

- Patterns and anatomical similarities in the fossil record can be used to identify cause and effect relationships
- Science assumes that objects and events in evolutionary history occur in consistent patterns that are understandable through measurement and observation.
- Relationships between embryos of different species show similarities in their development.
- General patterns of relatedness among embryos of different organisms can be inferred by comparing the macroscopic appearance of diagrams or pictures.
- Pictorial data can be used to identify patterns of similarities in embryological development across multiple species.
- Similarities in embryological development across multiple species show relationships that are not evident in the fully formed organisms.

Accommodations and Modifications

Accommodations and Modifications according to student IEP, 504, I&RS goals, and/or gifted status.

Assessment

Summative assessment: students who understand the concepts can:

- Use graphs, charts, and images to identify patterns within the fossil record.
- Analyze and interpret data within the fossil record to determine similaritiesand differences in findings.
- Make logical and conceptual connections between evidence in the fossil record and explanations about the existence, diversity, extinction, and change in many life forms throughout the history of life on Earth.
- Apply scientific ideas to construct explanations for evolutionary relationships.
- Apply the patterns in gross anatomical structures among modern organisms and between modern organisms and fossil organisms to construct explanations of evolutionary relationships.
- Apply scientific ideas about evolutionary history to construct an explanation for evolutionary relationships evidenced by similarities or differences in the gross appearance of anatomical structures.
- Use diagrams or pictures to identify patterns in embryological development across multiple species.
- Analyze displays of pictorial data to identify where the embryological development is related linearly and where that linear nature ends.

- Infer general patterns of relatedness among embryos of different organisms by comparing the macroscopic appearance of diagrams or pictures.

Formative Assessments

- Participation/Observations
- Questioning
- Discussion Circles
- Science Notebook
- Exit Slips
- Peer/Self Assessment
- Rubrics
- Teacher-created project-based assessment
- Turn & Talk

Alternate Assessments

- Teacher-created project-based assessment
- Alternate running records
- Discussion Circles
- Turn and Talks

Benchmark Assessments

- Teacher-created assessment

Resources

- Amplify
- BrainPOP
- Discovery Education