Working with the Tree of Life

ELC-4046

NGSS Standards

Grades 6-8:

NGSS and Common Core Standards

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LS1.A: Structure and Function

Organisms have structures and systems that perform essential functions.

Application: The questions about eukaryotes, archaea, reptiles, birds, and other organisms ask students to think about how cellular structures (e.g., mitochondria in eukaryotes) and physical traits (e.g., feathers in birds, gills in aquatic animals) help organisms survive. Understanding organelles, like the nucleus, or adaptations like opposable thumbs, relates directly to the function of biological structures.

LS1.B: Growth and Development of Organisms

Reproduction is essential for species survival, and animals engage in behaviors to increase the likelihood of reproduction.

Application: Questions about marsupials, eutherians, and primates examine reproductive strategies like the role of the placenta and pouch-based development.

These focus on the growth and development of organisms, particularly how they adapt for successful reproduction and survival.

LS2.A: Interdependent Relationships in Ecosystems

Plants, animals, and microorganisms interact in ecosystems in a variety of ways.

Application: The questions on plants, eukaryotes, insects, crustaceans, and other organisms explore interactions between species in ecosystems, including pollination, nutrient cycles, and predator-prey relationships. These questions reflect the relationships between different organisms and their environments, emphasizing interdependence.

LS2.C: Ecosystem Dynamics, Functioning, and Resilience

Ecosystems have carrying capacities based on biotic and abiotic factors.

Application: The questions regarding the decline of certain species, such as insects, birds, or amphibians, and how these declines affect ecosystems directly connect to understanding ecosystem dynamics and the impact of population changes.

LS4.B: Natural Selection

Natural selection leads to the predominance of certain traits in a population and the suppression of others.

Application: The material related to evolutionary processes in eukaryotes, reptiles, and cephalopods touches on how specific traits (e.g., intelligence in cephalopods, camouflage in reptiles) were favored through natural selection.

LS4.C: Adaptation

Evolution results from species adapting to their environment over time.

Application: The questions about marsupials, archaea, and primates ask students to think critically about how species have evolved to survive in unique environments, illustrating adaptation.

ESS2.E: Biogeology

The evolution of life has significantly altered the Earth's systems.

Application: The questions on the origin of life and how organisms like cyanobacteria changed the Earth's atmosphere (by producing oxygen) align with this standard, focusing on how life impacts Earth's systems.

Common Core State Standards (CCSS)

The material addresses the following Common Core Standards for English Language Arts (ELA) and literacy in science:

CCSS.ELA-LITERACY.RI.4-6.1: Reading Informational Text

Cite evidence from the text to support analysis of what the text says explicitly as well as inferences drawn from the text.

Application: Students are asked to interpret information about the structures and functions of organisms and infer how these relate to their survival and evolutionary history.

CCSS.ELA-LITERACY.RI.4-6.4: Determine the meaning of words and phrases

Determine the meaning of general academic and domain-specific words in a text relevant to a grade 4-6 topic.

Application: Students are introduced to terms like “endosymbiotic theory” or “photosynthesis,” requiring them to determine the meaning based on context or research.

CCSS.ELA-LITERACY.RI.4-6.7: Integrating Information

Interpret information presented visually, orally, or quantitatively (e.g., diagrams, charts, research).

Application: The material invites students to integrate information from various sources about different types of organisms and their roles in ecosystems, which aligns with this standard.

CCSS.ELA-LITERACY.W.4-6.2: Write informative/explanatory texts

Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

Application: By answering or creating their own questions about the content, students practice explaining complex scientific concepts, such as the evolution of eukaryotes or the adaptations of reptiles.

CCSS.ELA-LITERACY.SL.4-6.1: Engage in Collaborative Discussions

Engage effectively in collaborative discussions, building on others' ideas and expressing their own clearly.

Application: Through discussion of the material, students would engage in speaking and listening activities related to scientific inquiry and debate about organisms and ecosystems.