

Stackable Instructionally- embedded Portable Science (SIPS) Assessments

Grade 8 Unit 3 Understanding Earth History and the Origin of Species

Storyline Overview

July 2023



Grade 8 Unit 3: Storyline, Phenomena, and Segments

Storyline Overview

Students make sense of the key disciplinary ideas of natural selection, adaptation, evidence of common ancestry and diversity, inheritance and variation of traits, and history of planet Earth.

Anchor Phenomenon

In this unit, the anchor phenomenon is based on the shared experience the class will have of selecting from an online database of fossils found in their area. Students select a particular organism to think about throughout the unit.



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This is a starting point for discussions about the way traits in one animal provide evidence of descent through natural selection over the history of Earth, documented in genetics and the coding of protein by DNA.

Measurement Target

Students are able to apply Science and Engineering Practices with emphasis on analyzing and interpreting data to construct and support explanations for patterns in the change of lifeforms in the history of Earth, similarities and differences among organisms, patterns in the cause-and-effect relationships related to inheritance of traits through natural selection, and changes in populations over time.

Relationship to Prior and Subsequent Learning

Unit 3 engages students in learning about “Understanding Earth History and the Origin of Species” and building knowledge of the history of Earth and the fossil record that is part of that history. This extends to providing evidence for understanding the history of life through evolution and the relationship of previous life forms to those we find today. Students examine evidence for how genetics explains these changes through the effect of DNA mutations on protein structure. This builds on extended ideas related to the Earth’s location and movement within the solar system in Unit 2. Unit 4 focuses on wave behavior, including the transmission of energy through light.

Segment 1

Students develop and use models, obtain, evaluate, and communicate information, construct explanations, and use mathematical and computational thinking to learn about the importance of fossil records and the geological timescale in relation to rock strata and the existence of modern lifeforms.

Choose a particular organism from an online database of fossil records around the world.

Evaluate evidence for the history of Earth in its geologic record.

Analyze and interpret data for the relative age of rocks based on different layers and to explain apparent changes.

Obtain information on the changes in organisms over time and relate it to the geologic record.

Use data to create a timeline for the changes in fossils over Earth’s history related to their chosen organism.

Segment 2

Students analyze and interpret data, obtain, evaluate, and communicate information, and construct explanations while looking for patterns in various fossil records and relate them to modern life forms.

Obtain and evaluate information about traits to determine relationships in history of species related to their chosen organism.

Use cladograms and characteristic traits to construct explanations about the historical placement of organisms.

Obtain information on the role of the environment on the ancestors and descendants of the chosen organism.

Use evidence from incomplete fossil records to identify skeletons of different species.

Communicate information about evolution and differentiation of species.

Segment 3

Students obtain, evaluate, and communicate information and develop and use models about the relationships among cells, chromosomes, genes, alleles, and protein structure and function, and how they are affected by gene mutations.

Investigate the genetic code related to tasting phenylthiocarbamide (PTC).

Relate variations in genes, alleles, and chromosomes to evidence about variation in proteins.

Model the role of mutations on infectious diseases.

Obtain, evaluate, and communicate information about the impact of genetic mutations on the human species.

Revise model to show how genetic differences contribute to differences in traits from species to species.

Segment 4

Students analyze information and use mathematical and computational thinking about the role of the environment in affecting the distribution of species according to traits suited for changing environments.

Obtain and interpret data on changes in the population of a modern-day species over time.

Analyze data on the impact of the environment on the distribution of traits in a modern-day population.

Create a model to explain how populations change over time due to natural selection.

Present a final model explaining how surviving individuals lead to emergence of new, stable, and beneficial traits.