Unit 4: Biological Evolution
7th Grade Science
11 Class Meetings

Edited July 2021

Essential Questions

- How do we determine a fossil's time period?
- What do fossils teach us about the past, present, and future?

Enduring Understandings with Unit Goals

EU 1: The relative age of rocks can be determined by where they fall in a sequence.
- Organize the appearances of specific types of fossilized organisms in the fossil record as a function of time using sedimentary layers and the ages of rocks.

EU 2: Fossils document the existence, diversity, extinction, and change of life forms throughout Earth's history.
- Connect changes in anatomical structure and diversity of populations with their environments and time periods.
- Compare and contrast the features of animals today with fossilized organisms of the past.

Standards

Next Generation Science Standards:
- MS-LS4-1**:** Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.
- MS-LS4-2**:** Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.

Common Core State Standards:
- 7.RP.A.2b**:** Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
- CCSS.ELA-LITERACY.RL.7.1: Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

ISAAC Vision of the Graduate Competencies

Competency 1: Write effectively for a variety of purposes.
Competency 2: Speak to diverse audiences in an accountable manner.
Competency 3: Develop the behaviors needed to interact and contribute with others on a team.
Competency 4: Analyze and solve problems independently and collaboratively.
Competency 5: Be responsible, creative, and empathetic members of the community.

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Unit Content Overview

1. **Dating Fossils**
    - Discover how we use sedimentary layers and the ages of rocks to determine the age of a fossil.
    - Organize the appearances of specific types of fossilized organisms in the fossil record as a function of time.
2. **Anatomy of Fossilized Organisms and Organisms Today**
    - Connect changes in anatomical structure and diversity of populations with their environments and time periods.
    - Analyze and build phylogenic trees based on phenotypes and time.
    - Compare and contrast the features of organisms today with fossilized organisms of the past.

Interdisciplinary Connection:

- Language Arts - Word Problems
- Art – Illustrate organisms and their defining features
- Social Studies – Locate geographic locations of fossils

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Daily Learning Objectives with *Do Now Activities*

Students will be able to…

- Connect changes in anatomical structure and diversity of populations with their environments and time periods.
- Analyze and build phylogenic trees based on phenotypes and time.*
- Discover how we use sedimentary layers and the ages of rocks to determine the age of a fossil.*
- Organize the appearances of specific types of fossilized organisms in the fossil record as a function of time.*
- Compare and contrast the features of organisms today with fossilized organisms of the past.
- Demonstrate content knowledge for "Indiana Bones."*
- Demonstrate content knowledge for success on the unit exam.

Instructional Strategies/Differentiated Instruction

- Whole group instruction
- Guided notes
- Student-led instruction
- Independent problem-solving
- Collaborative problem-solving
- Graphic Organizer
- Cross-curricular problem solving (independent and collaborative)
- Accountable Talk
- Homework
- Word walls with visuals
- Small group instruction

Assessments

FORMATIVE ASSESSMENTS:

- Whiteboards
- Mid-class check-ins
- Exit Slips
- Accountable Talk Discussions
- Do Now
- Student-led instruction
- Homework
- Performance Task- "Indiana Bones"
    - Future Rubric Assessment in 2021-2022

SUMMATIVE ASSESSMENTS:

- Quiz - EU 1
- Performance Task- "Indiana Bones"
- Unit 4 Test

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Unit Task

Unit Task Name: "Indiana Bones"

Description: In this task, students will use their knowledge on fossil dating, phenotypes, and phylogenies to complete an archeological dig. Upon completion of their dig students will use rocks, sediment, and the shared phenological characteristics of their findings to create several phylogenetic trees. Afterwards, students will predict and debate the time period where their fossils originated. These organisms may not all fall into the same taxonomic classes but students won't be asked to track their lineage back any further (EU 1).

Evaluation: Summative Assessment and Future Rubric in 2021-2022 school year

Unit Resources

- Next Gen Science Standards
- Teacherspayteachers
- Khan Academy
- OpenSciEd
- Flipped Google Classroom Videos
- Worksheets
- Calculator
- Laptops
- Google Slides

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