3 Science Unit 2: Fossils & Changing Environments (Animals Through Time)

Content Area: **Science**
Course(s):
Time Period: **Marking Period 3**
Length: **9 Weeks**
Status: **Published**

Unit Overview

In this unit, students develop an understanding of how animals and their environments have changed through time. Fossils provide a window into the animals and habitats of the past. Analyzing the traits of animals that are alive today and comparing them to fossils, provides evidence of how these ancient organisms and environments of the past may have appeared.

Standards

Scientific & Engineering Practices

- Students embark on a pretend fossil dig where they analyze and interpret data from fossils. Students examine fossils and gather information about traits of these organisms of the past to infer what environments looked like long ago. Then, students use this evidence to engage in an argument and decide where some Mystery Fossils came from in the fossil dig based on their traits.

- Students analyze and interpret data from fossil records to determine what type of food an organism ate/eats. They use the fossil evidence to engage in an argument for why they chose each food source.

- Students carry out an investigation where they see how far they can run in eight steps and compare this to how far dinosaurs ran in eight steps, based on fossil evidence. Using mathematics and computational thinking, they first measure their leg length and then record how far they run for eight steps. They use this information and compare it to the dinosaur fossil data.

- Students analyze the traits of parent dogs to determine which puppy they could have. They construct explanations about which traits the puppy gets from each parent.

- Students carry out an investigation by using a model to simulate the introduction of a predator species on Lizard Island. Students simulate multiple generations of lizards, analyzing and interpreting the data after each one. They use this data to engage in argument from evidence to support their claim about how the offspring change from the original lizards.

- Students carefully observe animals that live in groups in order to obtain, evaluate, and communicate information about animal social behavior. Using the evidence from their observations, students engage in an argument to support their claim that animals form groups to help them survive.

- Students obtain and evaluate information from different people who live in Pondville, a town

with a severe mosquito problem. Then, using this information, students design solutions that will reduce the number of mosquitoes that live in Pondville.

- Students measure their own physical traits (arm strength, balance, and height) and then make predictions about how these traits would change after living in outer space for a year. Students use this information to construct an explanation for how the environment can influence and change physical traits.

Crosscutting Concepts

- Students observe that organisms have traits (structures) that help them survive (function) in a particular environment. Students also consider the stability and change of an environment over time based on the different types of fossils found in one particular area.
- Students consider that fossilized evidence of organism's teeth (structure) can determine which type of food they ate (function) and the type of environment they inhabited.
- Students examine patterns of dinosaur leg lengths and footprints. They find that when footprints are farther apart, this indicates that an organism is moving at a faster speed. They also observe that dinosaurs were able to run much faster than humans.
- Students recognize patterns in traits between parents and offspring.
- Students recognize the cause and effect relationship between a change in the environment and the survival of organisms that inhabit it. They recognize environments as a system, made up of interdependent parts that function as a whole. They can be stable and change over time at different rates of speed.
- Students recognize the cause and effect relationship between animals living in a group and the members of that group surviving.
- Students recognize the cause and effect relationship between a change in the environment and the survival of organisms that live there. They recognize environments as a system, made up of interdependent parts that function as a whole.
- Students recognize the cause and effect relationship between the environment and its influence on physical traits (physical characteristics).

3-LS4-1	Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.

Materials

Core Materials:

- Mystery Science
    - Where can you find whales in the desert?
    - How do we know what dinosaurs looked like?

    - Can you outrun a dinosaur?
    - How are you a part of the watery caves story?
- Teacher Created Labs

Supplemental Materials:

- BrainPop resources
- NewsELA
- GRC Lessons
- TBSAID
- Nearpod Activities

Technology

Technology Literacy

• 9.4.5.TL.1: Compare the common uses of at least two different digital tools and identify the advantages and disadvantages of using each.

• 9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings.

• 9.4.5.TL.3: Format a document using a word processing application to enhance text, change page formatting, and include appropriate images graphics, or symbols.

Technology - Engineering Design

• 8.2.5.ED.1: Explain the functions of a system and its subsystems.

• 8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.

• 8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.

Technology - Data & Analysis

• 8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.

• 8.1.5.DA.2: Compare the amount of storage space required for different types of data.

• 8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data.

• 8.1.5.DA.4: Organize and present climate change data visually to highlight relationships or support a claim.

• 8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

Technology - Effects on the Natural World

• 8.2.5.ETW.2: Describe ways that various technologies are used to reduce improper use of resources.

• 8.2.5.ETW.3: Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved.

• 8.2.5.ETW.4: Explain the impact that resources, such as energy and materials used to develop technology, have on the environment.

• 8.2.5.ETW.5: Identify the impact of a specific technology on the environment and determine what can be done to increase positive effects and to reduce any negative effects, such as climate change.

Evidence of Learning/Assessment

Formative Assessment

- Teacher Observation
- Quizzes
- Exit Tickets
- Labs

Summative Assessment

- Benchmark Tests
- Alternative Assessments: Performance Tasks & Projects

Accommodations & Modifications

Special Education

Follow IEP Plan which may contain some of the following examples…

- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Study Guides
- Limit number of questions
- Scribe
- Newsela leveled reading passages

Follow 504 Plan which may contain some of the following examples…

- In class/pull out support with special ed teacher
- Additional time during intervention time
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ELL

- Translation device/dictionary
- In class/pull out support with ESL teacher
- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
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At-risk of Failure

- Extra time during intervention
- In class/pull out support with special ed teacher
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Gifted & Talented

- Independent projects
- STEM Projects
- Leveled Reading with Newsela

Interdisciplinary Connections

Connections to NJSLS - English Language Arts

• RI.3.2 Determine the main idea of a text; recount the key details and explain how they support the main idea. (3-LS3-1), (3-LS3-2)

• RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. (3-LS3- 1), (3-LS3-2)

• W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS3-1), (3-LS3-2) • SL.3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace. (3-LS3-1), (3-LS3-2)

• RI.3.7 Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur). (3-LS1-1)

• SL.3.5 Create engaging audio recordings of stories or poems that demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details. (3-LS1-1)

Connections to NJSLS - Mathematics

• MP.2 Reason abstractly and quantitatively. (3-LS3-1), (3-LS3-2)

• MP.4 Model with mathematics. (3-LS3-1), (3-LS3-2)

• 3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters. (3-LS3-1), (3-LS3-2)

• 3.NBT Number and Operations in Base Ten (3-LS1-1)

• 3.NF Number and Operations—Fractions (3-LS1-1)

Career Readiness, Life Literacies, and Key Skills

Critical Thinking and Problem Solving:

• 9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).

• 9.4.5.CT.2: Identify a problem and list the types of individuals and resources (e.g., school, community agencies,

governmental, online) that can aid in solving the problem (e.g., 2.1.5.CHSS.1, 4-ESS3-1).

• 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems. • 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global

Career Ready Practices

- CRP6. Demonstrate creativity and innovation.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.