

# Unit 02: Animal Survival and Heredity

Content Area: **Template**  
Course(s):  
Time Period: **Full Year**  
Length: **FY**  
Status: **Published**

## Standards Alignment

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### New Jersey Student Learning Standards

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| 3-5-ETS1   | Engineering Design  |
| 3-5-ETS1-2 | Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.   |
| 3-LS2-1    | Construct an argument that some animals form groups that help members survive.  |
| 3-LS2      | Ecosystems: Interactions, Energy, and Dynamics  |
| 3-LS3-1    | Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.          |
| 3-LS3      | Heredity: Inheritance and Variation of Traits   |
| 3-LS4-4    | Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.                                   |
| 3-LS4-3    | Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.                                     |
| 3-LS4-2    | Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. |
| 3-LS4      | Biological Evolution: Unity and Diversity   |
| 3-LS4-1    | Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.   |

### Integration of Career Readiness, Life Literacies and Key Skills

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| CRP.K-12.CRP1 | Act as a responsible and contributing citizen and employee.                        |
| CRP.K-12.CRP2 | Apply appropriate academic and technical skills.                                   |
| CRP.K-12.CRP3 | Attend to personal health and financial well-being.                                |
| CRP.K-12.CRP4 | Communicate clearly and effectively and with reason.                               |
| CRP.K-12.CRP5 | Consider the environmental, social and economic impacts of decisions.              |
| CRP.K-12.CRP6 | Demonstrate creativity and innovation.   |
| CRP.K-12.CRP7 | Employ valid and reliable research strategies.                                     |
| CRP.K-12.CRP8 | Utilize critical thinking to make sense of problems and persevere in solving them. |

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| CRP.K-12.CRP9  | Model integrity, ethical leadership and effective management.      |
| CRP.K-12.CRP10 | Plan education and career paths aligned to personal goals.         |
| CRP.K-12.CRP11 | Use technology to enhance productivity.                            |
| CRP.K-12.CRP12 | Work productively in teams while using cultural global competence. |

## **Technology / Integration of Computer Science and Design Thinking**

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| TECH.8.2.5     | Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. |
| TECH.8.2.5.A   | The Nature of Technology: Creativity and Innovation: Technology systems impact every aspect of the world in which we live.  |
| TECH.8.2.5.A.2 | Investigate and present factors that influence the development and function of a product and a system.  |
| TECH.8.2.5.A.3 | Investigate and present factors that influence the development and function of products and systems, e.g., resources, criteria and constraints.   |
| TECH.8.2.5.C   | Design: The design process is a systematic approach to solving problems.  |
| TECH.8.2.5.C.1 | Collaborate with peers to illustrate components of a designed system.   |
| TECH.8.2.5.C.4 | Collaborate and brainstorm with peers to solve a problem evaluating all solutions to provide the best results with supporting sketches or models.   |
| TECH.8.2.5.D   | Abilities for a Technological World: The designed world is the product of a design process that provides the means to convert resources into products and systems.  |
| TECH.8.2.5.D.2 | Evaluate and test alternative solutions to a problem using the constraints and trade-offs identified in the design process to evaluate potential solutions.   |

## **Interdisciplinary Connections: NJSLs for ELA, Social Studies, Science and/or Math Section**

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|                  | Key Ideas and Details  |
| LA.K-12.NJLSA.R1 | Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. |
| LA.K-12.NJLSA.R2 | Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.   |
| LA.K-12.NJLSA.R3 | Analyze how and why individuals, events, and ideas develop and interact over the course of a text.   |
|                  | Craft and Structure  |
| LA.K-12.NJLSA.R4 | Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.                                  |
|                  | Integration of Knowledge and Ideas   |
| LA.K-12.NJLSA.R7 | Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.   |

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| LA.K-12.NJSLSA.R8  | Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.   |
| LA.RI.3            | Reading Informational Text   |
| LA.RI.3.1          | Ask and answer questions, and make relevant connections to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.   |
| LA.RI.3.2          | Determine the main idea of a text; recount the key details and explain how they support the main idea.   |
| LA.K-12.NJSLSA.W   | Writing  |
| LA.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.       |
| LA.RI.3.4          | Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.   |
| LA.K-12.NJSLSA.W2  | Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.                             |
| LA.RI.3.7          | Use information gained from text features (e.g., illustrations, maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).            |
| LA.RI.3.8          | Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence) to support specific points the author makes in a text.    |
| LA.K-12.NJSLSA.SL  | Speaking and Listening   |
|                    | Comprehension and Collaboration  |
| LA.K-12.NJSLSA.SL1 | Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.                         |
|                    | Presentation of Knowledge and Ideas  |
| LA.K-12.NJSLSA.SL4 | Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.           |
| LA.K-12.NJSLSA.SL5 | Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.   |
| LA.W.3.2           | Write informative/explanatory texts to examine a topic and convey ideas and information clearly.   |
| LA.SL.3.1          | Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly. |
| LA.SL.3.1.A        | Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.   |
| LA.SL.3.1.B        | Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).                          |
| LA.SL.3.1.C        | Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others.  |
| LA.SL.3.1.D        | Explain their own ideas and understanding in light of the discussion.  |
| LA.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.  |

## **Integration of Diversity, Equity and Inclusion; Climate Change; Informational and Media Literacy**

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see Crosswalks

## **21st Century Life and Careers**

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### **Stage I: Desired Results**

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### **Transfer/Overview/Rationale**

#### **Transfer / Overview / Rationale**

##### Unit Rationale

The purpose of this unit...

In this unit students will develop an appreciation for how animals and the places they live (their habitats) are not constant—they have changed over time. Fossils give us a window to the animals and habitats of the past. Selective breeding shows us not only how some animals of the past became domesticated, but allows us to imagine how they might look in the future.

### **Meaning**

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### **Essential Questions**

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Essential Questions

- Where can you find whales in a desert? (3-LS4-1, 3-LS4-3)
- How do we know what dinosaurs looked like? (3-LS4-1)
- Can you outrun a dinosaur? (3-LS4-1)

- What kind of animals might there be in the future? (3-LS3-1)
- Can selection happen without people? (3-LS2-1, 3-LS3-1, 3-LS4-2, 3-LS4-3, 3-LS4-4)

## **Enduring Understanding/Indicators of Understanding**

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### Enduring Understanding/Indicators of Understanding

- Fossils provide evidence of the types of organisms that lived long ago and also about the characteristics of their habitats.
- Fossils are clues to the past and can tell us what an organism looked like on the outside, the habitat it lived in, and the food it ate.
- Some dinosaurs are faster than others and scientists use their footprints to figure out how their speeds were different.
- Since many characteristics of organisms are inherited from their parents, people can change organisms to have the traits they want by selection.
- When the environment changes, some organisms survive well and reproduce, some have traits that help them survive less well, and some cannot survive at all.

## **Acquisition (Student Learning Objectives)**

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### **Knowledge**

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#### Knowledge

Students will know...

- Mystery 1: how fossils can reveal habitat change over time.
- Mystery 2: how to use fossils to learn about what an animal looked like and what food they ate.
- Mystery 3: how a dinosaur's footprints can reveal how quickly a dinosaur was running.
- Mystery 4: how people create new breeds of animals by mating (selecting) individuals with desirable traits.
- Mystery 5: how nature, not human beings, can slowly change the appearance of an animal using the process of selection.

## Skills

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### Skills

Student will be skilled at ...

- Identifying what food an animal ate by examining a fossil.
- Comparing and contrasting fossils to organisms found today.
- Analyzing and interpreting data from fossils to determine how an environment has changed over time.
- Constructing explanations about how selection occurs by humans choosing desirable traits to reproduce over many years.
- Modeling how natural selection occurs from environmental changes and how it affects an organism's species.
- Carrying out an investigation by comparing the stride length of student runners to the stride length of a comparable sized dinosaur.
- Using mathematics and computational thinking to record, graph the value and determine speed.

## Stage 3: Learning Plan

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### Resource and Mentor Texts

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#### Resources and Mentor Texts

- Mystery Science Animal Survival and Heredity Unit (see attachment)
- NJ State Model Curriculum

#### Mentor Texts:

- **Rockwell, A. (2006). *Backyard Bear*.** Bears belong in the woods—they can find everything they need to survive there. But what happens when people start knocking down trees and building houses where the woods used to be? This young black bear is about to find out.
- **Base, G. (2001). *The Water Hole*.** Exquisitely drawn animals come to a water hole to drink. With each new group of visitors, the pool of crisp, cool water shrinks ever so slightly. By the end, there is no longer anything to drink, and the landscape is parched and dead. All the animals have gone away - until long rains come and revive the lush scenery.
- **Patent, D. (1989) *Grandfather's Nose: Why We All Look Alike or Different*.** The story of the discovery of genetic science and the details of heredity covered in depth. Through the use of cartoon-like illustrations, complicated ideas about heredity and genetics are described.
- **Ewart, C. (2014). *Fossil*.** Transports readers back more than ninety million years to the age of the dinosaurs as a young girl finds a fossil, and a day in the life of a pterosaur unfolds. The pterosaur finally lives out its natural life, and layers of Earth and time transform the creature into a fossil--an amazing link to the past waiting to be discovered.

- **Baylor, B. (1984) *If You are a Hunter of Fossils*.** A fossil hunter searches the United States for fossils and evidence of life in ancient times. The fossil hunter imagines the environment of these organisms when they were living.
- **Miller, D. (2007) *Arctic Lights, Arctic Nights*.** Chronicles the physical and environmental changes that take place in Fairbanks Alaska from the summer solstice throughout the year on the 21st of each month. Information about the changes in the physical environment and the effects of these changes on the wildlife of the region is described.
- **Peters, L. (2003). *Our Family Tree: An Evolution Story*.** The story of the evolutionary process is told from the beginning of life on Earth to present life forms. The focus of this book is on families and how organisms have changed over time as a result of dramatic geologic events on the planet and the adaptable nature of life.

[Mystery Science: Animal Survival and Heredity Unit](#)

## **Formative Assessment Strategies**

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### Formative Assessment Strategies

- Science notebooks
- Group discussions (thumbs up, thumbs down, turn & talk)
- Analysis of student work
- Teacher observation
- Prepared written quizzes
- Admit/Exit Tickets
- Strategic questioning
- Think-pair-share
- Content check-ins using Kahoot, Quizizz
- Grand conversations

## **Learning Activities/Unit of Study**

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### Learning Activities/Unit of Study

The learning activities for this unit are directly linked to Mystery Science. The attachments provided are the lesson plans for each mystery. All worksheets and materials for each mystery are provided via link to Mystery Science within each lesson plan.

[Animals-Mystery 1](#)

[Animals-Mystery 2](#)

[Animals-Mystery 3](#)

[Animals-Mystery 4](#)

## **Modifications and/or Accommodations**

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### **Suggested Modifications (ELL, Sp. Ed, Gifted, At-risk of Failure)**

#### **English Language Learners**

Native language support: The teacher provides auditory or written content to students in their native language.

Adjusted Speech: The teacher changes speech patterns to increase student comprehension. This could include facing the students, paraphrasing, clearly indicating the most important ideas, and speaking more slowly.

Visuals: The teacher uses graphics, pictures, visuals, and manipulatives. This helps ELL students better understand and comprehend the subjects at hand.

Front-Loading Vocabulary: The teacher front loads vocabulary. This means providing students with a list of important vocabulary words they will need to know for a book, lesson, etc. prior to the lesson being taught. Including pictures to go with the vocabulary words is also very beneficial for the students.

#### **Special Education Students**

Chunking: The teacher presents information in a way that makes it easy for students to understand and remember. Chunking is based on the presumption that our working memory is easily overloaded by excessive detail. The best way to deliver information is to organize it into meaningful units. Because students with special needs get overloaded easily, chunking is an effective strategy to use with them.

Checking for Understanding: It is important to constantly check for understanding, especially for students who have accommodations. Teachers want to make sure students understand the concepts being covered in a way that makes sense to them.

Extra time: The teacher provides students with special needs extra time to complete work or answer questions. It is important to give students enough time to process their thoughts.

Oral Reading: The teacher will read work orally to students. Class work such as tests and literature circles may need to be read aloud to the student.

Timers: The teacher will use timers as an instructional tool. The use of timers is beneficial for students who have trouble completing tasks. Timers can be helpful so the student is aware of how much time they have to complete an assignment.

## Students with 504 Plans

**Chunking:** The teacher presents information in a way that makes it easy for students to understand and remember. Chunking is based on the presumption that our working memory is easily overloaded by excessive detail. The best way to deliver information is to organize it into meaningful units. Because students with special needs get overloaded easily, chunking is an effective strategy to use with them.

**Checking for Understanding:** It is important to constantly check for understanding, especially for students who have accommodations. Teachers want to make sure students understand the concepts being covered in a way that makes sense to them.

**Extra time:** The teacher provides students with special needs extra time to complete work or answer questions. It is important to give students enough time to process their thoughts.

## Gifted & Talented Strategies

**Extensions/Enrichments:** Teachers will provide gifted and talented students with extension/enrichment projects. Students will be challenged to further their understanding, to apply acquired knowledge, and/or to produce something in reference to acquired knowledge.

**Modify/Change Activities:** Teachers will monitor and modify activities to accommodate those students who need to be challenged further. Additional reading, problem-solving, writing, or project work is necessary for those students who are ready to move on at a rate more accelerated than their peers. In this way, G & T students are provided the same opportunity for support as special needs students.

## Students at Risk of School Failure

**Directions or Instructions:** Make sure directions and/or instructions are given in limited numbers. Give directions/instructions verbally and in simple written format. Ask students to repeat the instructions or directions to ensure understanding occurs. Check back with the student to ensure he/she hasn't forgotten.

**Peer Support:** Peers can help build confidence in other students by assisting in peer learning. Many teachers use the 'ask 3 before me' approach. This is fine, however, a student at risk may have to have a specific student or two to ask. Set this up for the student so he/she knows who to ask for clarification before going to you.

**Alternate or Modified Assignments:** Always ask yourself, "How can I modify this assignment to ensure the students at risk are able to complete it?" Sometimes you'll simplify the task, reduce the length of the assignment or allow for a different mode of delivery. For instance, many students may hand something in, the at-risk student may jot notes and give you the information verbally. Or, it just may be that you will need to assign an alternate assignment.

**Increase One to One Time:** When other students are working, always touch base with your students at risk and find out if they're on track or needing some additional support. A few minutes here and

there will go a long way to intervene as the need presents itself.

**Contracts:** It helps to have a working contract between you and your students at risk. This helps prioritize the tasks that need to be done and ensure completion happens. Each day write down what needs to be completed, as the tasks are done, provide a checkmark or happy face. The goal of using contracts is to eventually have the student come to you for completion sign-offs.

**Hands On:** As much as possible, think in concrete terms and provide hands-on tasks. This means a child doing math may require a calculator or counters. The child may need to tape record comprehension activities instead of writing them. A child may have to listen to a story being read instead of reading it him/herself.

**Tests/Assessments:** Tests can be done orally if need be. Break tests down in smaller increments by having a portion of the test in the morning, another portion after lunch and the final part the next day.

**Seating:** Seat students near a helping peer or with quick access to the teacher. Those with hearing or sight issues need to be close to the instruction which often means near the front.