Third Grade

The performance expectations in third grade help students formulate answers to questions such as: "What is typical weather in different parts of the world and during different times of the year? How can the impact of weather-related hazards be reduced? How do organisms vary in their traits? How are plants, animals, and environments of the past similar or different from current plants, animals, and environments? What happens to organisms when their environment changes? How do equal and unequal forces on an object affect the object? How can magnets be used?" Third grade performance expectations include PS2, LS1, LS2, LS3, LS4, ESS2, and ESS3 Disciplinary Core Ideas from the NRC Framework.

Students are able to organize and use data to describe typical weather conditions expected during a particular season. By applying their understanding of weather-related hazards, students are able to make a claim about the merit of a design solution that reduces the impacts of such hazards. Students are expected to develop an understanding of the similarities and differences of organisms' life cycles. An understanding that organisms have different inherited traits, and that the environment can also affect the traits that an organism develops, is acquired by students at this level. In addition, students are able to construct an explanation using evidence for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. Students are expected to develop an understanding of types of organisms that lived long ago and also about the nature of their environments. Third graders are expected to develop an understanding of the idea that when the environment changes some organisms survive and reproduce, some move to new locations, some move into the transformed environment, and some die. Students are able to determine the effects of balanced and unbalanced forces on the motion of an object and the cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other. They are then able to apply their understanding of magnetic interactions to define a simple design problem that can be solved with magnets. The crosscutting concepts of patterns; cause and effect; scale, proportion, and quantity; systems and system models; interdependence of science, engineering, and technology; and influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas.

In the third grade performance expectations, students are expected to demonstrate grade-appropriate proficiency in asking questions and defining problems; developing and using models, planning and carrying out investigations, analyzing and interpreting data, constructing explanations and designing solutions, engaging in argument from evidence, and obtaining, evaluating, and communicating information. Students are expected to use these practices to demonstrate understanding of the core ideas.

Eco-Schools USA Pathway Alignment

The National Wildlife Federation's Eco-Schools USA program has aligned their program pathways of sustainability to the NGSS. As a part of the Eco-Schools 7-Step Framework, linking to the curriculum, is a priority. This alignment is designed to highlight the natural connections between our national standards document and the Eco-Schools USA program.

Our program icons are used to denote pathway connections to the NGSS Performance Expectations. Not every topic, with its set of Performance Expectations are a fit with the Eco-Schools USA program and in that case an alignment will not be present.

Green STEM is an initiative of the National Wildlife Federation's Eco-Schools USA program and is focused on identifying best practice in the STEM fields as it relates to environment-based learning. These elements include:

- Problem-based learning
- Utilizing the school, both inside and out, as a learning laboratory
- The incorporation of two or more STEM disciplines within a single lesson, whole curricula, a set of standards, etc.
- A Maker mentality – design/create/solve
- A commitment to service learning
- An inclusive culture – where all students can learn and all students can participate

3.Interdependent Relationships in Ecosystems

3.Interdependent Relationships in Ecosystems

Students who demonstrate understanding can:

3-LS2-1. Construct an argument that some animals form groups that help members survive.

3-LS4-1. Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago. [Clarification Statement: Examples of data could include type, size, and distributions of fossil organisms. Examples of fossils and environments could include marine fossils found on dry land, tropical plant fossils found in Arctic areas, and fossils of extinct organisms.] [Assessment Boundary: Assessment does not include identification of specific fossils or present plants and animals. Assessment is limited to major fossil types and relative ages.]

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. [Clarification Statement: Examples of evidence could include needs and characteristics of the organisms and habitats involved. The organisms and their habitat make up a system in which the parts depend on each other.]

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.* [Clarification Statement: Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms.] [Assessment Boundary: Assessment is limited to a single environmental change. Assessment does not include the greenhouse effect or climate change.]

The performance expectations above were developed using the following elements from the NRC document A Framework for K-12 Science Education:

Science and Engineering Practices

Analyzing and Interpreting Data

Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.

- Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS4-1)

Engaging in Argument from Evidence

Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed worlds.

- Construct an argument with evidence, data, and/or a model. (3-LS2-1)
- Construct an argument with evidence. (3-LS4-3)
- Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-LS4-4)

Disciplinary Core Ideas

LS2.C: Ecosystem Dynamics, Functioning, and Resilience

- When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. (secondary to 3-LS4-4)

LS2.D: Social Interactions and Group Behavior

- Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size. (Note: Moved from K–2) (3-LS2-1)

LS4.A: Evidence of Common Ancestry and Diversity

- Some kinds of plants and animals that once lived on Earth are no longer found anywhere. (Note: Moved from K–2) (3-LS4-1)
- Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments. (3-LS4-1)

LS4.C: Adaptation

- For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4-3)

LS4.D: Biodiversity and Humans

- Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)

Crosscutting Concepts

Cause and Effect

- Cause and effect relationships are routinely identified and used to explain change. (3-LS2-1),(3-LS4-3)

Scale, Proportion, and Quantity

- Observable phenomena exist from very short to very long time periods. (3-LS4-1)

Systems and System Models

- A system can be described in terms of its components and their interactions. (3-LS4-4)

Connections to Engineering, Technology, and Applications of Science

Interdependence of Science, Engineering, and Technology

- Knowledge of relevant scientific concepts and research findings is important in engineering. (3-LS4-3)

Connections to Nature of Science

Scientific Knowledge Assumes an Order and Consistency in Natural Systems

- Science assumes consistent patterns in natural systems. (3-LS4-1)

Science is a Human Endeavor

- Most scientists and engineers work in teams. (3-LS4-3)

ECO-SCHOOLS USA PATHWAY ALIGNMENT

3-LS2-1 , 3-LS4-3, and 3-LS4-4

Using student's natural curiosity of nature, you can significantly increase student engagement in and understanding of more complicated abstract concepts by using your Certified Schoolyard Habitat(s)™ or Sustainable Food garden(s). While the reading and other language arts are an integral part of the learning experience it is just as important to allow students up close and personal practice with the natural world as it relates to independent relationships within ecosystems.

Specific examples –
3-LS2-1: Animals in the schoolyard that can help to bring this Performance Expectation home – bees, butterflies, birds, squirrels, chipmunks, lizards, spiders, etc.
3-LS4-3: Students who have been a part of the process related to the creation and care of school gardens are more apt to have experienced this throughout the growing seasons and will have less difficulty constructing arguments with the evidence from their own experiences.
3-LS4-4: Same logic applies here as above. When students are using their schoolyards as outdoor learning laboratories, constructing explanations, creating models, and resolving claims based on their experiences is more meaningful and authentic.

Connections to other DCIs in third grade: **3.ESS2.D** (3-LS4-3); **3.ESS3.B** (3-LS4-4)

Articulation of DCIs across grade-bands: **K.ESS3.A** (3-LS4-3)(3-LS4-4); **K.ETS1.A** (3-LS4-4); **1.LS1.B** (3-LS2-1); **2.LS2.A** (3-LS4-3),(3-LS4-4); **2.LS4.D** (3-LS4-3),(3-LS4-4); **4.ESS1.C** (3-LS4-1); **4.ESS3.B** (3-LS4-4); **4.ETS1.A** (3-LS4-4); **MS.LS2.A** (3-LS2-1),(3-LS4-1)(3-LS4-3),(3-LS4-4); **MS.LS2.C** (3-LS4-4); **MS.LS2.D** (3-LS2-1); **MS.LS4.A** (3-LS4-1); **MS.LS4.B** (3-LS4-3); **MS.LS4.C** (3-LS4-3),(3-LS4-4); **MS.ESS1.C** (3-LS4-1),(3-LS4-3),(3-LS4-4); **MS.ESS2.B** (3-LS4-1); **MS.ESS3.C** (3-LS4-4)

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

Common Core State Standards Connections:

ELA/Literacy –

RI.3.1	Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-LS2-1),(3-LS4-1),(3-LS4-3),(3-LS4-4)
RI.3.2	Determine the main idea of a text; recount the key details and explain how they support the main idea. (3-LS4-1),(3-LS4-3),(3LS4-4)
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-LS2-1),(3-LS4-1),(3-LS4-3),(3-LS4-4)
W.3.1	Write opinion pieces on topics or texts, supporting a point of view with reasons. (3-LS2-1),(3-LS4-1),(3-LS4-3),(3-LS4-4)
W.3.2	Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS4-1),(3-LS4-3),(3-LS4-4)
W.3.9	Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. (3-LS4-1)
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-LS4-3),(3-LS4-4)

Mathematics –

MP.2	Reason abstractly and quantitatively. (3-LS4-1),(3-LS4-4)
MP.4	Model with mathematics. (3-LS2-1),(3-LS4-1),(3-LS4-4)
MP.5	Use appropriate tools strategically. (3-LS4-1)
3.NBT	Number and Operations in Base Ten (3-LS2-1)
3.MD.B.3	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets. (3-LS4-3)
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-LS4-1)

3.Inheritance and Variation of Traits: Life Cycles and Traits

3.Inheritance and Variation of Traits: Life Cycles and Traits

Students who demonstrate understanding can:

3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death. [Clarification Statement: Changes organisms go through during their life form a pattern.] [Assessment Boundary: Assessment of plant life cycles is limited to those of flowering plants. Assessment does not include details of human reproduction.]

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. [Clarification Statement: Patterns are the similarities and differences in traits shared between offspring and their parents, or among siblings. Emphasis is on organisms other than humans.] [Assessment Boundary: Assessment does not include genetic mechanisms of inheritance and prediction of traits. Assessment is limited to non-human examples.]

3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment. [Clarification Statement: Examples of the environment affecting a trait could include normally tall plants grown with insufficient water are stunted; and, a pet dog that is given too much food and little exercise may become overweight.]

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. [Clarification Statement: Examples of cause and effect relationships could be plants that have larger thorns than other plants may be less likely to be eaten by predators; and, animals that have better camouflage coloration than other animals may be more likely to survive and therefore more likely to leave offspring.]

The performance expectations above were developed using the following elements from the NRC document A Framework for K-12 Science Education:

Science and Engineering Practices

Developing and Using Models
Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.
- Develop models to describe phenomena. (3-LS1-1)

Analyzing and Interpreting Data
Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations.
When possible and feasible, digital tools should be used.
- Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS3-1)

Constructing Explanations and Designing Solutions
Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.
- Use evidence (e.g., observations, patterns) to support an explanation. (3-LS3-2)
- Use evidence (e.g., observations, patterns) to construct an explanation. (3-LS4-2)

Connections to Nature of Science

Scientific Knowledge is Based on Empirical Evidence
- Science findings are based on recognizing patterns. (3-LS1-1)

Disciplinary Core Ideas

LS1.B: Growth and Development of Organisms
- Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1)

LS3.A: Inheritance of Traits
- Many characteristics of organisms are inherited from their parents. (3-LS3-1)
- Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3-LS3-2)

LS3.B: Variation of Traits
- Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1)
- The environment also affects the traits that an organism develops. (3-LS3-2)

LS4.B: Natural Selection
- Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing. (3-LS4-2)

Crosscutting Concepts

Patterns
- Similarities and differences in patterns can be used to sort and classify natural phenomena. (3-LS3-1)
- Patterns of change can be used to make predictions. (3-LS1-1)

Cause and Effect
- Cause and effect relationships are routinely identified and used to explain change. (3-LS3-2),(3-LS4-2)

ECO-SCHOOLS USA PATHWAY ALIGNMENT

3-LS1-1, 3-LS3-1, 3-LS3-2, 3-LS4-2

Using student's natural curiosity of nature, you can significantly increase student engagement in and understanding of more complicated abstract concepts by using your Certified Schoolyard Habitat(s)™ or Sustainable Food garden(s). While the reading and other language arts are an integral part of the learning experience it is just as important to allow students up close and personal practice with the natural world as it relates to life cycles and traits.

By participating in citizen science projects such as, Project Budburst, Monarch Watch, Project Feeder Watch, Frog Watch, Project Noah, and Wildlife Watch, it allows students to become active observers in the field and help better understand the biodiversity in their schoolyard and contribute to real science that makes a difference for our plants and animal species. Since scientists can't be in all places all the time it is imperative to engage students of all ages to engage in authentic science which contributes to better understanding plant and animal adaptations as well as similarities and differences from one generation to the next.

Connections to other DCIs in third grade: **3.LS4.C** (3-LS4-2)

Articulation of DCIs across grade-bands: **1.LS3.A** (3-LS3-1),(3-LS4-2); **1.LS3.B** (3-LS3-1); **MS.LS1.B** (3-LS1-1), (3-LS3-2); **MS.LS2.A** (3-LS4-2); **MS.LS3.A** (3-LS3-1); **MS.LS3.B** (3-LS3-1),(3-LS4-2); **MS.LS4.B** (3-LS4-2)

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Common Core State Standards Connections:

ELA/Literacy –

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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),(3-LS4-2)
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),(3-LS4-2)
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)
W.3.2	Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS3-1),(3-LS3-2),(3-LS4-2)
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),(3-LS4-2)
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)

Mathematics –

MP.2	Reason abstractly and quantitatively. (3-LS3-1),(3-LS3-2)
MP.4	Model with mathematics. (3-LS1-1),(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)
3.MD.B.3	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets. (3-LS4-2)
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)