

# **NYS Science, ELA and Math Learning Standards (PreK - 5)**

## [NYS P-2 standards](#)

### **Pre-K**

- **P. Life Sciences -Students who demonstrate understanding can:**
  - P-LS1-1. Observe familiar plants and animals (including humans) and describe what they need to survive. [Clarification Statement: Emphasis should be on determining what a variety of living organisms need to live and grow.]
    - Important background information for students to have: What it means to survive.
  - P-LS1-2. Plan and conduct an investigation to determine how familiar plants and/or animals use their external parts to help them survive in the environment. [Clarification Statement: Emphasis should be on the relationships between the physical and living environment. Examples of external parts could include roots, stems, leaves for plants and eyes, ears, mouth, arms, legs for animals.]
  - P-LS3-1. Develop a model to describe that some young plants and animals are similar to, but not exactly like, their parents. [Clarification Statement: Emphasis is on observation and pictorial representations of familiar plants and animals.]
    - Use squirrel photos, squirrel mapper game and squirrel kits to help students draw conclusions around differentiating traits among squirrel generations within the eastern gray squirrel populations.
- **Science and Engineering Practices**
  - Developing and using models – compare models to identify common features and differences (P-LS3-1)
- **Disciplinary Core Ideas**
  - Structure and function
  - inheritance of traits
  - variation of Traits
- **Crosscutting Concepts**
  - Cause and effect

### **Additional ELA and Math Standards for Implementation:**

There are many NYS NGLS connections throughout these K-5 standards for ELA, Mathematics. Examples below:

- PKR4 – Exhibit an interest in learning new vocabulary. (P-LS1-1),(P-LS1-2),(P-LS3-1)
- PKW1– Use a combination of drawing, dictating, oral expression, and/or emergent writing to state an opinion about a familiar topic in child-centered, authentic, play-based learning. (P-LS1-1),(P-LS1-2),(P-LS3-1)

- PKW3 – Use a combination of drawing, dictating, oral expression, and/or emergent writing to narrate an event or events in a sequence. (P-PS1-1),(P-PS2-1),(PPS4-1)
- PKW7 – Engage in a discussion using gathered information from experiences or provided resources. (P-LS1-1),(P-LS1-2),(P-LS3-1)
- PKSL2 – Interact with diverse formats and texts. (P-LS1-1),(P-LS1-2),(P-LS3-1)
- PKSL3 – Identify the speaker. (P-LS1-1),(P-LS1-2),(P-LS3-1)
- PKSL5 – Create a visual display. (P-LS1-1),(P-LS1-2),(P-LS3-1)

### Mathematics – **\*\*Possible extensions\*\***

- NY-PK.MD.1 – Identify measurable attributes of objects, such as length, and weight. Describe them using correct vocabulary (e.g., small, big, short, tall, empty, full, heavy, and light). (P-LS1-1),(P-LS1-2),(P-LS3-1)
- NY-PK.MD.2 – Sort objects into categories; count the numbers of objects in each category. 1 (limit category counts to be less than or equal to 10) (P-LS3-1)

## Kindergarten

- K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive. [Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not; the different kinds of food needed by different types of animals; the requirement of plants to have light; and that all living things need water and other materials to live, grow, and thrive.]
  - Highlight the different environments of the gray and black morph populations and the necessities in each place – whether similar or difference. Talking about the creation of urban environments and the changes from old to young growth forests.
- K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. [Clarification Statement: Examples of plants and animals changing their environment could include a squirrel digs in the ground to hide its food and tree roots can break concrete.]
  - Again, highlight the different environments of the gray and black morph populations and the necessities in each place – whether similar or different. Would be good to include the different things they would change in each type of environment Urban vs. Rural.
- K-ESS3-1. Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live. [Clarification Statement: Examples of relationships could include that deer eat buds and leaves, therefore, they usually live in forested areas, and grasses need sunlight so they often grow in meadows. Plants, animals, and their surroundings make up a system.]
  - Same as above.

- K-ESS3-3. Communicate solutions that will reduce the impact of humans on living organisms and non-living things in the local environment. \* [Clarification Statement: Examples of human impact on the environment (land, water, air, plants, and animals) could include cutting trees to produce paper and using resources to produce bottles. Examples of solutions could include reusing paper and recycling cans and bottles.] The performance expectations above we

## First Grade

- 1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.\* [Clarification Statement: Examples of human problems that can be solved by mimicking plant or animal solutions could include designing clothing or equipment to protect bicyclists by mimicking turtle shells, acorn shells, and animal scales; stabilizing structures by mimicking animal tails and roots on plants; keeping out intruders by mimicking thorns on branches and animal quills; and, detecting intruders by mimicking eyes and ears.]

### DCIs:

- 1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.\* [Clarification Statement: Examples of human problems that can be solved by mimicking plant or animal solutions could include designing clothing or equipment to protect bicyclists by mimicking turtle shells, acorn shells, and animal scales; stabilizing structures by mimicking animal tails and roots on plants; keeping out intruders by mimicking thorns on branches and animal quills; and, detecting intruders by mimicking eyes and ears.]

## Second Grade

- 2-LS2-2. Develop a simple model that illustrates how plants and animals depend on each other for survival.\* [Clarification Statement: Examples could include animals dispersing seeds or pollinating plants, and plants providing food, shelter, and other materials for animals.]
- 2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats. [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.] [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.]

- **Science and Engineering Practices:**
  - **Planning and Carrying Out Investigations**
    - Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.
    - Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-LS2-1) Make observations (firsthand or from media) to collect data that can be used to make comparisons. (2-LS4-1)
  - **DCIs**
    - LS4.D: Biodiversity and Humans There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)

### **New York State Next Generation Learning Standards Connections:**

#### **ELA/Literacy –**

- 2W6 – Develop questions and participate in shared research and explorations to answer questions and to build knowledge. (2-LS2-1),(2-LS4-1)
- 2W7 – Recall and represent relevant information from experiences or gather information from provided sources to answer a question. (2-LS2-1),(2-LS4-1)
- 2SL5 – Include digital media and/or visual displays in presentations to clarify or support ideas, thoughts, and feelings. (2-LS2-2)

#### **Mathematics –**

- MD.10 – Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a picture graph or a bar graph. (2-LS2-2),(2-LS4-1)

## **NYS P-12 Science, ELA and Math Learning Standards (grades 3-5)**

[Link to standards grades 3-5](#)

### **Third grade**

#### **3. Interdependent Relationships in Ecosystems**

- 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 both natural and human-influenced 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.]

#### **Science and Engineering Practices:**

- 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)

#### **DCIs**

- 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)
- 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

#### **CCC**

- Cause and Effect Cause and effect relationships are routinely identified and used to explain change. (3-LS2-1),(3-LS4-3)
- 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-LS4-4)

#### **New York State Next Generation Learning Standards Connections:**

##### **ELA/Literacy –**

- 3R1 – Develop and answer questions to locate relevant and specific details in a text to support an answer or inference. (3-LS2-1),(3-LS4-1),(3-LS4-3),(3-LS4-4) 3R2 Determine a theme or central idea and explain how it is supported by key details; summarize portions of a text. (3-LS4-1),(3-LS4-3),(3-LS4-4)
- 3R3 – In informational texts, describe the relationship among a series of events, ideas, concepts, or steps 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)

- 3W1 – Write an argument to support claim(s), using clear reasons and relevant evidence. (3-LS2-1),(3-LS4-1),(3-LS4-3),(3-LS4-4)
- 3W7 – Recall relevant information from experiences or gather information from multiple sources; take brief notes on sources and sort evidence into provided categories. (3-LS4-1)
- 3SL4 – 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 –**

NY-3.MD.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. (3-LS4-3)

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

- 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 include 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 produce offspring.]

### **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-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)

#### **DCIs**

- 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. (3-LS3-2) (NYSED) Some characteristics result from the interactions of both inheritance and the effect of the 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)

#### **CCC**

- 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)

### **New York State Next Generation Learning Standards Connections:**

#### **ELA/Literacy –**

- 3R1 – Develop and answer questions to locate relevant and specific details in a text to support an answer or inference. (3-LS3-1),(3-LS3-2),(3-LS4-2)
- 3R2 – Determine a theme or central idea and explain how it is supported by key details; summarize portions of a text. (3-LS3-1),(3-LS3-2),(3-LS4-2)
- 3R3 – In informational texts, describe the relationship among a series of events, ideas, concepts, or steps in a text, using language that pertains to time, sequence, and cause/effect. (3-LS3-1),(3-LS3-2),(3-LS4-2)
- 3R7 – Explain how specific illustrations or text features contribute to what is conveyed by the words in a text (e.g., create mood, emphasize character or setting, or determine where, when, why, and how key events occur). (3-LS1-1)
- 3W2 – Write informative/explanatory texts to explore a topic and convey ideas and information relevant to the subject. (3-LS3-1),(3-LS3-2),(3-LS4-2)
- 3SL – 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)

## Mathematics –

- MP.2 – Reason abstractly and quantitatively. (3-LS3-1),(3-LS3-2),(3-LS4-2)
- MP.5 – Use appropriate tools strategically. (3-LS3-1),(3-LS3-2),(3-LS4-2)
- NY-3.MD.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. (3-LS4-2)
- NY-3.MD.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)

## Fourth Grade

[Link to standards grades 3-5](#)

### 4. Structure, Function, and Information Processing

- 4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. [Clarification Statement: Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin.] [Assessment Boundary: Assessment is limited to macroscopic structures within plant and animal systems.]

### Science and Engineering Practices

- Construct an argument with evidence, data, and/or a model. (4-LS1-1)

### DCIs

- LS1.A: Structure and Function Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1)

### CCC

- Systems and System Models A system can be described in terms of its components and their interactions. (4- LS1-1), (LS1-2)

### New York State Next Generation Learning Standards Connections:

- ELA/Literacy – 4W1 Write an argument to support claim(s), using clear reasons and relevant evidence. (4-LS1-1)

## Fifth Grade

- No directly related standards to evolution, gene expression. Variation of traits



- This EGS content can possibly be wrapped into ecosystems within food chain consumers and consumed. However, the content will need to reiterate the important points of evolution and genetics in order to fully convey the concepts completely.
- There is also potential to include this project among the standard for engineering design and speak to the impacts of urbanization on squirrel populations. This would create an opening for the squirrel mapper project.