# TRUMBULL PUBLIC SCHOOLS
# Trumbull, Connecticut

# Science Curriculum
# Grade 2
# Next Generation
# January 2024


## Curriculum Writing Team:

| | |
|---|---|
| Stephanie Helminger | Science Teacher, Daniels Farm Elementary |
| Karen Houghton | Science Teacher, Daniels Farm Elementary |
| Paula Martins | Science Teacher, Frenchtown Elementary |
| Cathy Fedak | Science Teacher, Jane Ryan Elementary |
| Diana Reding | Science Teacher, Middlebrook Elementary |
| Amy Congdon | Science Teacher, Tashua Elementary |
| Elizabeth Doherty | Science Program Leader, Grades K-5 |
| Dr. Susan Iwanicki | Assistant Superintendent |

# SCIENCE - NEXT GENERATION
# Grade 2

## Table of Contents

## CORE VALUES AND BELIEFS

The Trumbull Public School System, in partnership with the community, strives to meet the educational needs of all students within a challenging and supportive academic environment that empowers each student to become a life-long learner and to live and participate in a democratic, diverse and global society.

- We believe that all individuals are capable of learning.
- We believe that all individuals should have the resources necessary to achieve success within a challenging curriculum.
- We believe that a family, school, and community partnership is essential to our success.
- We believe that a safe and orderly environment is critical to learning.
- We believe that there is strength in diversity and that all individuals are worthy of our respect and dignity.
- We believe that our school climate must be welcoming, caring, and supportive for all members of the learning community.
- We believe that a reflective evaluation of present practices and processes is necessary in order to plan for our future.

## INTRODUCTION & PHILOSOPHY

The Connecticut State Board of Education, in its 2008 Position Statement on Science Education, calls for a systematic approach to ensuring that every student in Connecticut receives a rich and coordinated PK-12 education in science. Science learning should focus simultaneously on developing an understanding of core concepts, as well as knowing how scientists work collaboratively to test ideas, analyze evidence and solve problems. The realization of this vision is critical for our students' futures, as well as for Connecticut's place in a globally competitive economy.

In 2015, the Connecticut State Board of Education adopted the Next Generation Science Standards which embodies the National Research Council's *Framework for K-12 Education: Practices, Crosscutting Concepts, and Core Ideas* (2011); and furthermore developed a 5-year Implementation Plan of the Next Generation Science Standards (NGSS) for transitioning curriculum, instruction, and assessment. (Appendix B). The NGSS architecture was designed to provide information to teachers and curriculum and assessment developers beyond the traditional one line standard and uses Science and Engineering Practices along with various components of the Disciplinary Core Ideas and Crosscutting Concepts to make up the performance expectations for students.

The Board offers guidelines to support the establishment of collaborations among various stakeholders to build a coordinated science education system. (SDE, 2008).
As developed by the writers of the *Framework for K-12 Science Education* (Council, 2011), a core idea for K-12 science instruction should:

1. "Have broad importance across multiple sciences or engineering disciplines or be a key organizing principle of a single discipline."

2. “Provide a key tool for understanding or investigating more complex ideas and solving problems.”
3. “Relate to the interests and life experiences of students or be connected to societal or personal concerns that require scientific or technological knowledge.”
4. “Be teachable and learnable over multiple grades at increasing levels of depth and sophistication.” (Council, 2011)

The Trumbull Public School’s Grade 2 science curriculum addresses the Next Generation Science Standards as listed with each unit of study.

## SAFETY FIRST

The Trumbull Public School System follows the recommended guidelines for student safety in the classroom as represented in the National Science Education Standards, State Science Frameworks and NGSS, the National Science Teachers Association, and OSHA and as outlined in subsections of Policy 6000 in regards to Instruction. We encourage and foster a hands-on, process and inquiry-based approach to science instruction with student safety always first and foremost in mind. The use of lab safety guidelines are supported throughout the district.

## COURSE GOALS

The course goals derive from the 2013 Next-Generation Science Standards. Goals are listed specific to each unit in this curriculum guide, and developed through unit lessons using the 5-E learning model (engage, explore, explain, elaborate, evaluate) in order to encourage student engagement and foster metacognitive learning strategies through a reflective process. An important role of science education is not to teach “all the facts” but rather to prepare students with sufficient core knowledge so that they can later acquire additional information on their own.

## COURSE ENDURING UNDERSTANDINGS

Structure and Properties of Matter
Students will understand…

- Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature.
- Matter can be described and classified by its observable properties.
- A great variety of objects can be built up from a small set of pieces.
- Heat and cooling of a substance may cause changes that can be observed.
- Some changes in matter are reversible and some are irreversible.

Earth’s Systems: Processes that Shape the Earth
Students will understand…

- Earth changes over time. Some of those changes occur very slowly and other changes occur very quickly.
- Humans can create designs to slow or prevent wind or water from changing the shape of the land.

- Water is found in oceans, rivers, lakes, and ponds. The majority of water on Earth is salt water, and a small amount of water is freshwater.
- Water can exist as solid ice and in liquid form.
- Maps are used to show where land and water are found across our planet. These maps allow us to monitor any changes on Earth.

Ecosystem Diversity: Interdependent Relationships in Ecosystems
Students will understand…

- Plants depend on water and light to grow.
- Plants depend on animals/insects for pollination or to move their seeds around.
- There are many different kinds of living things in any area, and they exist in different places on land and in water.
- Organisms live in different habitats that provide them with food, water, shelter and the necessary climate needed for their survival.
- Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solution to other people.

## COURSE ESSENTIAL QUESTIONS

- How can one describe matter?
- How are different types of matter similar and different from one another?
- How can one tell the differences between the states of matter?
- How does heating and cooling create changes in matter?
- Are all objects made from other objects?
- What do plants need to grow?
- How do plants and animals help each other?
- Why do different plants and animals live in different habitats?
- Why do plants need pollinators?
- Why do scientists model their thinking?
- What are some examples of sudden events that change the Earth's surface?
- What are some ways that humans can help slow down weathering and erosion?
- How does water cycle though Earth?
- How does water impact Earth's surface?

## COURSE KNOWLEDGE AND SKILLS

Crosscutting scientific and engineering concepts as outlined in the Next Generation Science

Standards(NGSS):

Students will know…

- Patterns. Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them.
- Cause and effect: Mechanism and explanation. Events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and explaining causal

relationships and the mechanisms by which they are mediated. Such mechanisms can then be tested across given contexts and used to predict and explain events in new contexts.

- Scale, proportion, and quantity. In considering phenomena, it is critical to recognize what is relevant at different measurements of size, time, and energy and to recognize how changes in scale, proportion, or quantity affect a system's structure or performance.
- Systems and system models. Defining the system under study-specifying its boundaries and making explicit a model of that system provides tools for understanding and testing ideas that are applicable throughout science and engineering.
- Energy and matter: flows, cycles, and conservation. Tracking fluxes of energy and matter into, out of, and within systems helps one understand the systems possibilities and limitations.
- Structure and function. The way in which an object or living thing is shaped and its substructure determine many of its properties and functions.
- Stability and change. For natural and built systems alike, conditions of stability and determinants of rates of change or evolution of a system are critical elements of study.

Students will be able to …

- Ask questions (for science) and define problems (for engineering)
- Develop and use models
- Plan and carry out investigations
- Analyze and interpret data
- Use mathematics and computational thinking
- Construct explanations (for science) and design solutions (for engineering)
- Engage in arguments from evidence
- Obtain, evaluate, and communicate information

Scope and Sequence

| | |
|---|---|
| September to December | Bundle 1: Structure and Properties of Matter |
| January to Mid-April | Bundle 2: Earth's Systems: Processes that Shape of the Earth- Earth Materials |
| Mid-April to June | Bundle 3: Interdependent Relationships in Ecosystems- Ecosystem Diversity |

# BUNDLE 1:

## Structure and Properties of Matter

## Matter

**Unit Overview:**

Although matter is the fundamental substance that constitutes everything in our environment, the concept of matter can be abstract and challenging to explain. To aid students in grasping the concept of matter, this unit utilizes hands-on activities that encourage students to engage with materials, pose questions, and draw connections between matter and natural phenomena. Through a series of lessons, students progressively develop an understanding that all objects are composed of smaller components, and these smaller parts consist of particles. The behavior of these particles varies depending on the state of matter, whether it's solid, liquid, or gas. Students also explore the consequences of mixing different types of matter and the impact of adding or removing energy. This unit serves as a significant introduction to the field of chemistry, providing a foundation for further learning.

**Unit Goals:**

**Science Standards:**

NGSS: 2-PS1-1: Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

NGSS: 2-PS1-2: Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.

NGSS: 2-PS1-3: Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.

NGSS: 2-PS1-4: Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.

The following standards derive from the 2013 Next-Generation Science (NGSS) Elementary School Engineering Design Standards.

NGSS.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.

The following course goals derive from the 2010 Connecticut Core Standards.

**ELA-Literacy Standards:**

CCS.ELA-Literacy.RI.2.1**:** Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. *(2-PS1-4)*

CCS.ELA-Litearcy.RI.2.3: Describe the connection between a series of historical events, scientific ideas, or concepts, or steps in technical procedures in a text. *(2-PS1-4)*

CCS.ELA-Literacy.RI.2.8: Describe how reasons support specific points the author makes in a text. (*2-PS1-2),(2PS1-4)*

CCS.ELA-Literacy.W.2.1: Write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons that support the opinion, use linking words (e.g.,because, and, also) to connect opinion and reasons, and provide a concluding statement or section. *(2-PS1-4)*

CCS.ELA-Literacy.W.2.8: Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations).
*(2-PS1-1),(2-PS1-2),(2-PS1-3)*

**Mathematics Standards:**

CCS.Mathematics.MP.2: Reason abstractly and quantitatively. *(2-PS-1-2)*

CCS.Mathematics.MP.4: Model with mathematics. *(2-PS1-1),(2-PS1-2)*

CCS.Mathematics.MP.5: Use appropriate tools strategically. *(2-PS1-2)*

CCS. Mathematics.*2.MD.D.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 bar graph. *(2-PS1-1),(2-PS1-2)*

## ***BUNDLE 1: Structure and Properties of Matter***

- **Science & Engineering Practices**
  - **Planning and Carrying Out Investigations**
    - Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. *(2-PS1-1)*
  - **Analyzing and Interpreting Data**
    - Analyze data from tests of an object or tool to determine if it works as intended. *(2-PS1-2)*
  - **Constructing Explanations and Designing Solutions**
    - Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. *(2-PS1-3)*
  - **Engaging in Argument from Evidence**
    - Construct an argument with evidence to support a claim. (2-PS1-4)
- **Disciplinary Core Ideas**
  - **PS1.A: Structure and Properties of Matter**
    - Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. *(2-PS1-1)*
    - Different properties are suited to different purposes. *(2-PS1-2),(2-PS1-3)*
    - A great variety of objects can be built up from a small set of pieces. *(2-PS1-3)*
  - **PS1.B: Chemical Reactions**
    - Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not. *(2-PS1-4)*
- **Crosscutting Concepts**
  - **Patterns**
    - Patterns in the natural and human designed world can be observed. *(2-PS1-1)*
  - **Cause and Effect**
    - Events have causes that generate observable patterns. *(2-PS1-4)*
    - Simple tests can be designed to gather evidence to support or refute student ideas about causes. *(2-PS1-2)*
  - **Energy and Matter**
    - Objects may break into smaller pieces and be put together into larger pieces, or change shapes. *(2-PS1-3)*

**Unit Essential Questions:**

1. What is matter, and what are its different forms?
2. How can we describe and compare the properties of different materials?
3. What are the properties of solids, liquids and gases, and how are they different from each other?
4. How can we use our senses to observe and describe the properties of materials?
5. What happens when different materials are mixed together, and how can we separate them again?
6. How do materials change when they are heated or cooled, and why?
7. Why do some materials sink and others float?

**Scope and Sequence of Bundle 1:**

Lesson 1: Small Parts Make Big Things
Lesson 2: What's the Matter?
Lesson 3: Solids, Liquids and Mixtures
Lesson 4: Describing Matter
Lesson 5: Heating Matter

**Phenomenon:** An engineer, builder, or inventor must consider many factors when choosing the materials to construct something. Whether it's a pencil, a skyscraper, or a sailboat, the materials used in the object are carefully chosen based on its function. The anchoring phenomenon for *Matter* is making connections between a material and how it is used.

**Focus questions:**

- What are the three states of matter?
- Why can't we see particles?
- How does the motion of particles change?
- Is gas made of particles?
- What are the properties of solids?
- What are the properties of liquids?
- What is a mixture?
- How can you use physical properties to describe objects?
- Which materials are the best choice for your project?
- How does matter change state?
- How do chemical reactions cause identity changes?
- Why is it important to evaluate design plans?

**Academic Vocabulary:**

behavior, characteristic, chemical change, colloid, different, evaporation, flexible, float, fluid, fluidity, gas, graduated cylinder, identity change, invisible, liquid, magnify, malleability, matter, microscope, mixture, part, particle, physical change, porous, property, sink, small, solid, specifications, state change, states of matter, structure, substance, viscosity, water vapor, whole

## Assured Assessments:

**Formative/Skills:**

- Student Investigation Sheets
- Science Notebook Entries
- Whole group check-in discussions
- Monitoring during Turn and Talk
- Student responses during class discussions
- Review students' questions about the investigative phenomenon from the beginning of the lesson.
- Tell Me More Extension - responses

**Summative/Content:**

- Matter Checkpoint One
- Matter Checkpoint Two

**Resources:**

Core

- Building Blocks of Science® 3D: Matter (©2019) Carolina Biological Supply Company. Burlington, NC.
- Building Blocks of Science Literacy Series™: Matter. Carolina Biological Supply Company. Print.

Supplemental

- Classroom Libraries

**Time Allotment**

- Bundle 1:  Structure and Properties of Matter- Matter Trimester 1

# BUNDLE 2:

## Earth's Systems: Processes That Shape the Earth
## Earth Materials

**Unit Overview:**

Earth's surface is in a constant state of change, shaped by natural materials like water, minerals, rocks, and soil. These elements play a crucial role in forming various landforms, from canyons to mountains. While many changes to landforms occur over extended periods, some agents of change, such as volcanoes and floods, can expedite these transformations. In this curriculum, students delve into these concepts through hands-on exploration, interactive discussions, and problem-solving exercises. They make observations, formulate predictions, analyze and graph data, construct claims supported by evidence and reasoning, and engage in the engineering design process

**Unit Goals:**

**Science Standards:**

2-ESS1-1: Use information from several sources to provide evidence that Earth events can occur quickly or slowly.

2-ESS2-1: Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.

2-ESS2-2: Develop a model to represent the shapes and kinds of land and bodies of water in an area.

2-ESS2-3: Obtain information to identify where water is found on Earth and that it can be solid or liquid

The following course goals derive from the 2010 Connecticut Core Standards.

**ELA-Literacy Standards**:

CCS.ELA-Litearcy.RI.2.1: Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. *(2-ESS1-1).*

CCS.ELA-Literacy.RI.2.3: Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. *(2-ESS1-1),(2-ESS2-1).*

CCS.ELA-Literacy.RI.2.9: Compare and contrast the most important points presented by two texts on the same topic. *(2-ESS2-1)*

CCS.ELA-Literacy.W.2.6: With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. *(2-ESS1-1),(2-ESS2-3)*.

CCS.ELA-Literacy.W.2.7: Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). *(2-ESS1-1).*

CCS.ELA-Literacy.W.2.8: Recall information from experiences or gather information from provided sources to answer a question. *(2-ESS1-1),(2-ESS2-3)*

CCS.ELA-Literacy.SL.2.2: Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. *(2-ESS1-1)*

CCS.ELA-Literacy.SL.2.5: Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (2-ESS2-2)

**Mathematics Standards:**

CCS.Mathematics.MP.2: Reason abstractly and quantitatively. *(2-ESS2-1),(2-ESS2-1), (2-ESS2-2)*

CCS.Mathematics.MP.4: Model with mathematics. *(2-ESS1-1),(2-ESS2-1),(2-ESS2-2)*

CCS.Mathematics.MP.5: Use appropriate tools strategically. *(2-ESS2-1)*

CCS.Mathematics 2.NBT.A: Understand place value. *(2-ESS2-1)*

CCS.Mathematics 2.NBT.A.3: Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. *(2-ESS2-2)*

CCS.Mathematics 2.MD.B.5: Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem. (2-ESS2-1)

The following standards derive from the 2013 Next-Generation Science (NGSS) Elementary School Engineering Design Standards.

NGSS.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.

## ***BUNDLE 2: Earth's Systems: Processes that Shape the Earth***

- **Science & Engineering Practices**
  - **Developing and Using Model**s
    - Develop a model to represent patterns in the natural world. *(2-ESS2-2)*
  - **Constructing Explanations and Designing Solutions**
    - Make observations from several sources to construct an evidence-based account for natural phenomena. *(2-ESS1-1)*
    - Compare multiple solutions to a problem. *(2-ESS2-1)*
  - **Obtaining, Evaluating, and Communicating Information**
    - Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a scientific question. *(2-ESS2-3)*
- **Disciplinary Core Ideas**
  - **ESS1.C: The History of Planet Earth**
    - Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. *(2-ESS1-1)*
  - **ESS2.A: Earth Materials and Systems**
    - Wind and water can change the shape of the land. *(2-ESS2-1)*
  - **ESS2.B: Plate Tectonics and Large-Scale System Interactions**
    - Maps show where things are located. One can map the shapes and kinds of land and water in any area. *(2-ESS2-2)*
  - **ESS2.C: The Roles of Water in Earth's Surface Processes**
    - Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. *(2-ESS2-3)*
  - **ETS1.C: Optimizing the Design Solution**
    - Because there is always more than one possible solution to a problem, it is useful to compare and test designs. *(secondary to 2-ESS2-1)*
- **Crosscutting Concepts**
  - **Patterns**
    - Patterns in the natural world can be observed. *(2-ESS2-2),(2-ESS2-3)*
  - **Stability and Change**
    - Things may change slowly or rapidly. *(2-ESS1-1),(2-ESS2-1)*

**Unit Essential Questions:**

- What are the things that make up the Earth's surface, and how do they shape the land?
- What makes the Earth's surface change, and does it happen quickly or slowly?
- How does water move around the Earth, and how does it impact the land?
- What are the different types of rocks, and how can we tell them apart?
- How does sand form from rocks, and why is this important?
- What is in the dirt where we live, and how does it affect the environment?
- How can wind and water change the Earth's surface, and what can we do to stop them from causing problems like erosion?
- How do big rivers and ice impact the way the land looks?

**Scope and Sequence of Bundle 2:**

Lesson 1: Water
Lesson 2: Rocks
Lesson 3: Sand
Lesson 4: Soil
Lesson 5: Changing Earth/Changing Land
Lesson 6: My Model Island

**Phenomenon:** The surface of Earth is constantly changing. The results of these changes usually take a long time to become noticeable, but some agents of change, such as volcanoes and floods, cause land to change more quickly. The anchoring phenomenon in *Earth Materials* is how natural materials such as water, minerals, rocks, and soil are important parts of Earth's surface.

**Essential/Focus questions:**

- Where's the water?
- How does water move on Earth?
- How much of the Earth is water and how much is land?
- What can I learn by studying rocks?
- Can I make a claim about how landforms change?
- What can we learn by studying sand?
- How can water and wind change sand?
- Can I design a barrier to reduce wind erosion?
- What makes up soil?
- What can we learn by studying soil?
- How can wind and water affect soil?
- How do glaciers and rivers change land?
- How do Earth's natural processes change land?

**<u>Academic Vocabulary:</u>**

barrier, condensation, condense, conserve, deposition, desert, Earth's materials, erosion, evaporate, evaporation, glacier, humus, igneous rock, island, lake, landform, metamorphic rock, mineral, ocean, precipitation, relief map, river, rock, runoff, sand, sand dune, sediment, sedimentary rock, soil, temperature, topsoil, vegetation, volcano, water cycle, water vapor, weathering

## Assured Assessments

**Formative/Skills:**

- Student Investigation Sheets
- Science Notebook Entries
- Whole group check-in discussions
- Monitoring during Turn and Talk
- Student responses during class discussions
- Review students' questions about the investigative phenomenon from the beginning of the lesson.
- Tell Me More Extension - responses

**Summative/Content:**

- Water Cycle Checkpoint
- Earth Materials Checkpoint

## Resources:

Core

- Building Blocks of Science® 3D:Earth Materials (©2019) Carolina Biological Supply Company. Burlington, NC.
- Building Blocks of Science Literacy Series™: Earth Materials. Carolina Biological Supply Company. Print.

Supplemental

- Online resources will be listed with lesson outlines on "Pacing Chart".
- Classroom and Learning Commons content related libraries

**Time Allotment**

- Bundle 2: Earth's Systems: Processes that Shape the Earth: Earth Materials- Trimester 2

# BUNDLE 3:
## Interdependent Relationships in Ecosystems
## Ecosystem Diversity

**Unit Goals:**

An ecosystem is the living and nonliving things that interact with one another in a specific area. Within ecosystems are smaller habitats, which are the places where living things can meet their basic needs—water, air, a food source (or sunlight for plants), and a shelter. The availability of these resources varies from habitat to habitat. For example, there is less water in a desert than in a wetland. The water in an ocean is different from the water in the tundra. Because of these differences, different things live in each habitat on Earth. The characteristics that plants and animals have depend on the habitat in which they live. Some characteristics make an organism suited to survive in multiple habitats. For example, ectothermic animals with scales can survive in a desert or a grassland. In contrast, some characteristics are suited for only one kind of habitat; only certain types of plants and animals can survive in salty ocean water. Throughout the unit students will identify different habitats, determine the growth patterns of plants, explore plants' dependence on animals, recognize the diversity of living things,and consider their own impact on the world around them.

**Unit Goals:**

**Science Standards:**

2-LS2-1: Plan and conduct an investigation to determine if plants need sunlight and water to grow.

2-LS2-2: Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

2-LS4-1: Make observations of plants and animals to compare the diversity of life in different habitats.

The following course goals derive from the 2010 Connecticut Core Standards.

**ELA-Literacy Standards:**

CCS.ELA-Literacy.W.2.7: Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). *(2-LS2-1),(2-LS4-1)*

CCS.ELA-Literacy.W2.8: Recall information from experiences or gather information from provided sources to answer a question. *(2-LS2-1),(2-LS4-1)*

CCS.ELA-Liteacy.SL.2.5: Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. *(2-LS2-2)*

**Mathematics Standards:**
CCS.Mathematics.MP.2: Reason abstractly and quantitatively.*(2-LS2-1), (2-LS4-1)*

CCS.Mathematics.MP.4: Model with mathematics *(2-LS2-1), (2-LS2-1), (2-LS4-1)*

CCS.Mathematics.MP.5: Use appropriate tools strategically. *(2-LS2-1)*

CCS.Mathematics2.MD.D.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. *(2-LS2-2),(2-LS4-1)*

The following standards derive from the 2013 Next-Generation Science (NGSS) Elementary School Engineering Design Standards.

NGSS.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

## ***BUNDLE 3:*** **Molecules and Organisms: Matter and Energy in Ecosystems**

- **Science & Engineering Practices**
  - **Developing and Using Models**
    - Develop a simple model based on evidence to represent a proposed object or tool. *(2-LS2-2)*
  - **Planning and Carrying Out Investigations**
    - 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 which can be used to make comparisons. *(2-LS4-1)*
- **Disciplinary Core Ideas**
  - **LS2.A: Interdependent Relationships in Ecosystems**
    - Plants depend on water and light to grow. *(2-LS2-1)*
    - Plants depend on animals for pollination or to move their seeds around. *(2-LS2-2)*
  - **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)*
  - **ETS1.B: Developing Possible Solutions**
    - Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. *(secondary to 2-LS2-2)*
- **Crosscutting Concepts**
  - **Cause and Effect**
    - Events have causes that generate observable patterns. *(2-LS2-1)*

- **Structure and Function**
  - The shape and stability of structures of natural and designed objects are related to their function(s). *(2-LS2-2)*

**Unit Essential Questions:**

- What is an ecosystem, and how do living and nonliving components interact within it?
- How do different habitats vary in terms of the availability of essential resources like water, air, food, and shelter?
- How do the characteristics of plants and animals depend on the specific habitat they inhabit?
- What adaptations allow organisms to survive in multiple habitats, and which adaptations are habitat-specific?
- How do organisms, including humans, impact the diversity of life within their habitats?
- How do different types of habitats influence the growth patterns and life cycles of plants?
- What is the role of animals in processes like pollination, seed dispersion, and plant germination?
- How can human activities influence the living and nonliving elements of different habitats, and what are the consequences of these impacts?

**Scope and Sequence of Bundle 3:**

Lesson 1: Organisms and Habitats
Lesson 2: Plant Growth
Lesson 3: Plant and Animal Interactions
Lesson 4: Diversity of Life
Lesson 5: Relationship in an Ecosystem

**Phenomenon:**. Many different habitats can be found on Earth, each with its own unique climate, access to light, and communities of organisms. Whether you go on a short trip within your state or on an intercontinental vacation, you can make comparisons between your local region and a new region. Perhaps the air is drier, there are fewer birds, or you find brightly colored plants that you've never seen before. The anchoring phenomenon for this unit is the variety of habitats on Earth and observing the life within them.

**Focus questions:**

- What do living things need to survive? (biotic and abiotic factors)
- What type of habitat do I live in?
- What do plants need to grow?
- What is the life cycle of a plant?
- Where do plants grow?
- How do plants depend on animals?
- How do animals help to pollinate or disperse seeds?
- Can I design a habitat for a pillbug?
- How do humans interact with their habitat?

**Academic Vocabulary:**
characteristic, climate, diverse, ecosystem, energy, food, germination, habitat, impact, living, nonliving, organism, photosynthesis, plant, pollination, pollution, producer, protect, seed, reproduction, shelter, soil, survive, seed dispersal

## Assured Assessments

**Formative/Skills:**

- Student Investigation Sheets
- Science Notebook Entries
- Whole group check-in discussions
- Monitoring during Turn and Talk
- Student responses during class discussions
- Review students' questions about the investigative phenomenon from the beginning of the lesson.
- Tell Me More Extension - responses

**Summative/Content:**

- Plants Checkpoint
- Seed Dispersal Checkpoint
- Habitat Checkpoint

**Resources:**
Core

- Building Blocks of Science® 3D: Ecosystem Diversity (©2019) Carolina Biological Supply Company. Burlington, NC.
- Building Blocks of Science Literacy Series™: Ecosystem Diversity. Carolina Biological Supply Company. Print.

Supplemental

- Online resources will be listed with lesson outlines on "Pacing Chart".
- Classroom and Learning Commons content related libraries

**Time Allotment**

- Bundle 3: Interdependent Relationships in Ecosystems: Ecosystem Diversity.