TRUMBULL PUBLIC SCHOOLS

Trumbull, Connecticut

GRADE 4 SCIENCE

Draft for Pilot 2018-19
(Last Revision Date: 1996)

Draft for Pilot 2018-19
This document, presented to the Board of Education Curriculum Committee on Aug. 9, 2018, will be developed further during 2018-19, the first year of implementation. A full curriculum guide will be returned to the Curriculum Committee to be formally recommended for adoption by the full Board prior to the 2019-20 school year.

Curriculum Writing Team

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Grade 4 Science
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The Trumbull Board of Education will continue to take Affirmative Action to ensure that no persons are discriminated against in its employment.

CORE VALUES AND BELIEFS

The Trumbull School Community engages in an environment conducive to learning which believes that all students will **read** and **write effectively**, therefore communicating in an articulate and coherent manner. All students will participate in activities **that present problem-solving through critical thinking**. Students will use technology as a tool applying it to decision making. We believe that by fostering self-confidence, self-directed and student-centered activities, we will promote **independent thinkers and learners**. We believe **ethical conduct** to be paramount in sustaining the welcoming school climate that we presently enjoy.

Approved 8/26/2011

INTRODUCTION & PHILOSOPHY

The Connecticut State Board of Education, based on its 2008 Position Statement on Science Education, has supported "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 the globally competitive economy."

The Board offers five principles to support strong elementary grades science education:

- "Ensure that the instructional focus for science is comparable to that provided for language arts and mathematics and teachers are able to integrate literacy and numeracy instruction within the context of students' science learning experiences."
- "Maintain class sizes that ensure instructional excellence and the safety of the students and the teacher."
- "Provide indoor and outdoor science learning areas, including rooms with flat, movable desks or tables and chairs, appropriate science equipment, storage space, and access to water and electricity as needed."
- "Provide students with multiple opportunities every week to experience inquiry investigations that develop students' abilities to question, explore, observe, gather simple data, create graphs, draw conclusions based on the data, and build their understanding of natural phenomena."
- "Provide science enrichment opportunities to foster student interest in science."

In 2015, the Connecticut State Board of Education adopted the Next-Generation Science Standards (NGSS), which embody the National Research Council's *Framework for K-12 Science Education* (2012). The TPS Kindergarten science curriculum integrates the NGSS as listed for each unit of study. The NGSS architecture uses science and engineering practices along with various components of disciplinary core ideas and crosscutting concepts to comprise the performance expectations for students. Based on the NRC *Framework*, a core idea for science education should meet at least two of the following four criteria:

- "Have broad importance across multiple sciences or engineering disciplines or be a key organizing principle of a single discipline."
- "Provide a key tool for understanding or investigating more complex ideas and solving problems."
- "Relate to the interests and life experiences of students or be connected to societal or personal concerns that require scientific or technological knowledge."
- "Be teachable and learnable over multiple grades at increasing levels of depth and sophistication."

The TPS Grade 3 Science curriculum also follows the TPS guidelines for student safety in the classroom as represented in the National Science Education Standards, the Next-Generation Science Standards, the National Science Teachers Association, and OSHA. The curriculum encourages and fosters a hands-on, process and inquiry-based approach to science education, with student safety first and foremost. Lab safety guidelines are implemented through the district.

The curriculum is designed to be implemented within the parameters established by Trumbull Board of Education Policy 6112.2, "Allotment of Time for Subjects, Grades K-5."

COURSE GOALS

The course goals derive from the 2013 Next-Generation Science Standards and the 2010 Connecticut Core 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

Students will understand that . . .

- Earth's major systems interact in multiple ways to affect earth's surface materials and processes. Human activities affect Earth's systems and their interactions at its surface. Maps can help locate the different land and water features where people live and in other areas of Earth. Living things affect the physical characteristics of their regions. Many types of rocks and minerals are formed from the remains of organisms or are altered by their activities. All materials, energy, and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not. A variety of hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. However, humans are doing things to help protect Earth's resources and environments.

- Energy can be moved from place to place by moving objects or through sound, light, or electric currents. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced. Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy. When objects collide, the contact forces transfer energy so as to change the object's motion. The expression "produce energy" typically refers to the conversion of stored energy into a desired form for practical use. It is important to be able to concentrate energy so that it is available for use where and when it is needed. For example, batteries are physically transportable energy storage devices, whereas electricity generated by power plants is transferred from place to place through distribution systems. Waves, which are regular patterns of motion, can be made in water by disturbing the surface. Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks). Digitized information can be transmitted over long distances without significant degradation. High-tech devices, such as computers or cell phones, can receive and decode information – convert it from digitized form to voice – and vice versa.

- Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain. Animals are able to use their perceptions and memories to guide their actions.

- Simple design problems can be solved through the development of an object, tool, process, or system and include several criteria for success and constraints on materials, time, or cost. Multiple solutions to a problem can be evaluated based on how well they meet the criteria and constraints of the design problem. An investigation can be planned and conducted to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.

COURSE ESSENTIAL QUESTIONS

- How do people reconstruct and date events in Earth's planetary history?
- How and why is Earth constantly changing?
- How do Earth's major systems interact?
- How do the properties and movements of water shape Earth's surface and affect its systems?
- How do living organisms alter Earth's processes and structures?

- How do human activities and Earth's surface processes (including natural disasters) affect each other?
- How do humans depend on Earth's resources?
- How can humans explain and predict interactions between objects and within systems of objects?
- How can one predict an object's continued motion, changes in motion, or stability?
- What is energy?
- How do food and fuel provide energy?
- How are waves used to transfer energy and information?
- What are the characteristic properties and behaviors of waves?
- How do organisms live, grow, respond to their environment, and reproduce?
- How do organisms detect, process, and use information about the environment?
- How do engineers solve problems?
- What are the criteria and constraints of a successful solution?
- How can various proposed design solutions be compared and improved?

COURSE KNOWLEDGE & SKILLS

Students will understand . . .

- 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 measures 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.

SCIENCE YEAR AT A GLANCE

September – December	Unit 1: Earth's Systems, History, and Human Impact
January – mid-April	Unit 2: Waves and Their Applications in Technologies for Information Transfer
mid-April – June	Unit 3: From Molecules to Organisms: Structures and Processes

UNIT 1
Earth's Systems, History, and Human Impact

Unit Goals

At the completion of this unit, students will:

NGSS.4-ESS1-1	Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.
NGSS.4-ESS2-1	Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.
NGSS.4-ESS2-2	Analyze and interpret data from maps to describe patterns of Earth's features.
NGSS.4-ESS3-1	Obtain and combine information to describe that energy and fuels are derived from natural resources and that their uses affect the environment.
NGSS.4-ESS3-2	Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.
NGSS.3-5-ETS1-1	Define a simple design problem reflecting a need or a want that includes specific criteria for success and constraints on materials, time, or cost.
NGSS.3-5-ETS1-3	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.
CCS.ELA-Literacy.W.4.7	Conduct short research projects that build knowledge through investigation of different aspects of a topic.
CCS.ELA-Literacy.W.4.8	Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.
CCS.ELA-Literacy.W.4.9	Draw evidence from literary or informational texts to support analysis, reflection, and research.
CCS.Mathematics.MP.2	Reason abstractly and quantitatively.

CCS.Mathematics.MP.4	Model with mathematics.
CCS.Mathematics.MP.5	Use appropriate tools strategically.
CCS.Mathematics.4.MD.1	Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.

Science & Engineering Practices	**Disciplinary Core Ideas**	**Crosscutting Concepts**
Constructing Explanations and Designing Solutions: • Identify the evidence that supports particular points in an explanation. (NGSS.4-ESS1-1) • Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution. (NGSS.4-ESS3-2) Planning and Carrying Out Investigations: • Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon. (NGSS.4-ESS2-1) Analyzing and Interpreting Data: • Analyze and interpret data to make sense of phenomena using logical reasoning. (NGSS.4-ESS2-2) Obtaining, Evaluating, and Communicating Information: • Obtain and combine	ESS1.C: The History of Planet Earth: • Local, regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed. (NGSS.4-ESS1-1) ESS2.A: Earth Materials and Systems: • Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around. (NGSS.4-ESS2-1) ESS2.B: Plate Tectonics and Large-Scale System Interactions: • The locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in	Patterns: • Patterns of change can be used as evidence to support an explanation. (NGSS.4-ESS1-1, NGSS.4-ESS2-2) Cause and Effect: • Cause and effect relationships are routinely identified, tested, and used to explain change. (NGSS.4-ESS2-1) Connections to Engineering, Technology, and Applications of Science: Influence of Science, Engineering, and Technology on Society and the Natural World: • Over time, people's needs and wants change, as do their demands for new and improved technologies. (NGSS.4-ESS3-1) • Engineers improve existing technologies or develop new ones to increase their benefits, to decrease known risks, and to meet societal demands. (NGSS.4-ESS3-2)

information from books and other reliable media to explain phenomena. (NGSS.4-ESS3-1)	patterns. Most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans. Major mountain chains form inside continents or near their edges. Maps can help locate the different land and water features of Earth. (NGSS.4-ESS-2-2) ESS2.E: Biogeology: • Living things affect the physical characteristics of their regions. (NGSS.4-ESS2-1) ESS3.A: Natural Resources: • Energy and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not. (NGSS.4-ESS3-1) ESS3.B: Natural Hazards: • A variety of hazards result from natural processes (e.g., earthquakes, tsunamis, volcanic eruptions). Humans cannot eliminate the hazards but can take steps to reduce their impacts. (NGSS.4-ESS3-2) ETS1.B: Designing Solutions to Engineering Problems: • Testing a solution involves investigating how well it performs under a range of likely conditions.	Connections to Nature of Science: Scientific Knowledge Assumes an Order and Consistency in Natural Systems: • Science assumes consistent patterns in natural systems. (NGSS.4-ESS1-1)

	(secondary to NGSS.4-ESS3-2)	

Unit Essential Questions

- How do people reconstruct and date events in Earth's planetary history?
- How and why is Earth constantly changing?
- How do Earth's major systems interact?
- How do the properties and movements of water shape Earth's surface and affect its systems?
- How do living organisms alter Earth's processes and structures?
- How do human activities and Earth's surface processes (including natural disasters) affect each other?
- How do humans depend on Earth's resources?
- How do engineers solve problems?
- What are the criteria and constraints of a successful solution?
- How can various proposed design solutions be compared and improved?

Scope and Sequence

- Earth's Systems Phenomenon: Throughout history, strong earthquakes have occurred, leading to volcanic eruptions. For example, the West Coast of the United States experiences many earthquakes. In 1980, a major earthquake triggered the eruption of Mount St. Helens in Washington.
  - What causes earthquakes?
  - Why does the West Coast experience earthquakes?
  - Why did Mount St. Helens erupt after an earthquake?
  - What causes layers of sand, soil, or clay to form?
  - Are there differences between and among soil, sand, and clay?
  - What is the difference between a map and a globe?
  - Where are most fossils found?
  - Why are fossils found in regions where water once existed?
  - Why are water animals found deeper underground?
- Erosion Phenomenon: Driving around the country, you may notice warning signs alerting people about landslides, rockslides, mudslides, or flooding. With heavy rainfall, it is crucial to exercise caution.
  - What causes landslides, rockslides, mudslides, and flooding?
  - Why are these events more common during rainfall?
  - Are there solutions to prevent landslides, rockslides, mudslides, and flooding?

Assured Assessments
Formative Assessment:

- Class discussions
- Collaborative investigations
- Science Notebooks
- Diagrams

Summative Assessment:

- Earth's Systems
- Layers of Soil
- Erosion Control
- End-of-unit Assessment: Earth's Systems

Resources
Core

- *Changing Earth*, Carolina Biological Supply Company.
- Carolina Biological Student Readers. *Changing Earth*. Carolina Biological Supply Company. Print.

- *Building for Erosion Control*, Pearson.
- Pearson Science Readers. *Building for Erosion Control*. Pearson. Print.

Supplemental

- *Erosion*. Nashua, NH: Delta Education, 2004. Print.

Time Allotment

- September – December

UNIT 2
Waves and Their Applications in Technologies for Information Transfer

Unit Goals

At the completion of this unit, students will:

NGSS.4-PS3-1	Use evidence to construct an explanation relating the speed of an object to the energy of that object.
NGSS.4-PS3-2	Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.
NGSS.4-PS3-3	Ask questions and predict outcomes about the changes in energy that occur when objects collide.
NGSS.4-PS3-4	Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.
NGSS.4-PS4-1	Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.
NGSS.4-PS4-3	Generate and compare multiple solutions that use patterns to transfer information.
NGSS.4-ESS3-1	Obtain and combine information to describe that energy and fuels are derived from natural resources and that their uses affect the environment.
NGSS.3-5-ETS1-1	Define a simple design problem reflecting a need or a want that includes specific criteria for success and constraints on materials, time, or cost.
NGSS.3-5-ETS1-3	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.
CCS.ELA-Literacy.RI.4.1	Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
CCS.ELA-Literacy.RI.4.3	Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what

	happened and why, based on specific information in the text.
CCS.ELA-Literacy.RI.4.9	Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.
CCS.ELA-Literacy.W.4.2	Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
CCS.ELA-Literacy.W.4.7	Conduct short research projects that build knowledge through investigation of different aspects of a topic.
CCS.ELA-Literacy.W.4.8	Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.
CCS.ELA-Literacy.W.4.9	Draw evidence from literary or informational texts to support analysis, reflection, and research.
CCS.ELA-Literacy.SL.4.5	Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes.
CCS.Mathematics.MP.2	Reason abstractly and quantitatively.
CCS.Mathematics.MP.4	Model with mathematics.
CCS.Mathematics.MP.5	Use appropriate tools strategically.
CCS.Mathematics.4.MD.1	Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.
CCS.Mathematics.4.OA.3	Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

CCS.Mathematics.4.G.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Asking Questions and Defining Problems: • Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships. (NGSS.4-PS3-3) Planning and Carrying Out Investigations: • Make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (NGSS.4-PS3-2) Constructing Explanations and Designing Solutions: • Use evidence (e.g., measurements, observations, patterns) to construct an explanation. (NGSS.4-PS3-1) • Apply scientific ideas to solve design problems. (NGSS.4-PS3-4) • Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution. (NGSS.4-PS4-3) Developing and Using Models: • Develop a model using an	PS3.A: Definitions of Energy: • The faster a given object is moving, the more energy it possesses. (NGSS.4-PS3-1) • Energy can be moved from place to place by moving objects or through sound, light, or electric currents. (NGSS.4-PS3-2, NGSS.4-PS3-3) PS3.B: Conservation of Energy and Energy Transfer: • Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result; the air gets heated and sound is produced. (NGSS.4-PS3-2, NGSS.4-PS3-3) • Light also transfers energy from place to place. (NGSS.4-PS3-2) • Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been	Energy and Matter: • Energy can be transferred in various ways and between objects. (NGSS.4-PS3-1, NGSS.4-PS3-2, NGSS.4-PS3-3, NGSS.4-PS3-4) Patterns: • Similarities and differences in patterns can be used to sort and classify natural phenomena. (NGSS.4-PS4-1) • Similarities and differences in patterns can be used to sort and classify designed products. (NGSS.4-PS4-3) Cause and Effect: • Cause and effect relationships are routinely identified. (NGSS.4-PS4-2) 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. (NGSS.4-PS4-3) Connections to Nature of Science:

analogy, example, or abstract representation to describe a scientific principle. (NGSS.4-PS4-1) • Develop a model to describe phenomena. (NGSS.4-PS4-2)	produced to begin with by transforming the energy of motion into electrical energy. (NGSS.4-PS3-2, NGSS.4-PS3-4) PS3.C: Relationship between Energy and Forces: • When objects collide, the contact forces transfer energy so as to change the objects' motions. (NGSS.4-PS-3-3) PS3.D: Energy in Chemical Processes and Everyday Life: • The expression "produce energy" typically refers to the conversion of stored energy into a desired form for practical use. (NGSS.4-PS3-4) ETS1.A: Defining Engineering Problems: • Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (secondary to NGSS.4-PS3-4) PS4.A: Wave Properties: • Waves, which are regular patterns of motion, can be	Scientific Knowledge Assumes an Order and Consistency in Natural Systems: • Science assumes consistent patterns in natural systems. (NGSS.4-ESS1-1)

	made in water by disturbing the surface. When waves move across the surface of deep water, the water goes up and down in place; there is no net motion in the direction of the wave except when the water meets a beach. (NGSS.4-PS4-1) • Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks). (NGSS.4-PS4-1) ESS3.A: Natural Resources: • Energy and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not. (NGSS.4-ESS3-1) ETS1.C: Optimizing the Design Solution: • Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (secondary to NGSS.4-PS4-3)	

Unit Essential Questions

- How can one predict an object's continued motion, changes in motion, or stability?
- What is energy?
- How are waves used to transfer energy and information?
- What are the characteristic properties and behaviors of waves?
- How do humans depend on Earth's resources as energy?
- How do food and fuel provide energy?

- How do engineers solve problems?
- What are the criteria and constraints of a successful solution?
- How can various proposed design solutions be compared and improved?

Scope and Sequence

- Phenomenon: Energy travels in ways that one may not see. Energy is everywhere! (http://safeyoutube.net/w/zwWd).
    - How does energy travel?
    - What are some types of energy that exist?
    - What is needed to move an object?
    - How is energy transferred?
    - How does electrical energy transfer to a lightbulb?
    - How do sound waves move through matter?
    - What is the sound receiver for humans, and how does it work?

Assured Assessments

Formative Assessment:

- Class discussions
- Collaborative investigations
- Science Notebooks
- Diagrams

Summative Assessment:

- Energy Waves
- Electrical Energy
- Sound Energy

Resources

Core

- *Force and Motion*, Delta Science.
- Delta Science First Readers. *Force and Motion*. Nashua, NH: Delta Education, 2005. Print.
- *Magnetism and Electricity*, FOSS Science.
- Delta Science First Readers. *Magnetism and Electricity*. Nashua, NH: Delta Education, 2009. Print.
- *Physics of Sound*, FOSS Science.
- Delta Science First Readers. *Physics of Sound*. Nashua, NH: Delta Education, 2004. Print.

Supplemental

- TBA

Time Allotment

- January – mid-April

Unit 3 follows a draft structure for the 2018-19 school year, with Unit Goals & Time Allotment included below, and the remainder of the unit plan to be developed during the 2018-19 school year under the leadership of the Coordinator of STEM K-8.

UNIT 3

From Molecules to Organisms: Structures and Processes

Unit Goals

At the completion of this unit, students will:

NGSS.4-LS1-1	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
NGSS.4-LS1-2	Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.
CCS.ELA-Literacy.W.4.1	Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
CCS.ELA-Literacy.SL.4.5	Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes.
CCS.Mathematics.4.G.3	Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models: • Use a model to test interactions concerning the functioning of a natural system. (NGSS.4-LS1-2) Engaging in Argument from Evidence: • Construct an argument with evidence, data, and/or a model. (NGSS.4-LS1-1)	LS1.A: Structure and Function: • Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (NGSS.4-LS1-1) LS1.D: Information Processing:	Systems and System Models: • A system can be described in terms of its components and their interactions. (NGSS.4-LS1-1, NGSS.4-LS1-2)

	• Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain. Animals are able to use their perceptions and memories to guide their actions. (NGSS.4-LS1-2)	

Time Allotment

- mid-April – June