TRUMBULL PUBLIC SCHOOLS

Trumbull, Connecticut

GRADE 3 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.

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Grade 3 Science
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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 . . .

- Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. Rainfall helps shape the land and affects the types of living things found in a region. Weather and climate are driven by interactions of the geosphere, hydrosphere, and atmosphere, with inputs of energy from the sun. Weather is the minute-by-minute day-by-day variations of the atmosphere's condition on a local scale. Scientists record the patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. Climate describes the ranges of an area's typical weather conditions and the extent to which those conditions vary over years to centuries. A variety of hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts.

- Plants and animals have unique and diverse life cycles that include being born (sprouting in plants), growing, developing into adults, reproducing, and eventually dying. 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. Many characteristics of organisms are inherited from parents. Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Offspring acquire a mix of traits from their biological parents. Different organisms vary in how they look and function because they have different inherited information. The environment affects the traits that an organism develops; differences in where they grow or in the food they consume may cause organisms that are related to end up looking or behaving differently. Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, water, and minerals from the environment and release waste matter (gas, liquid, or solid) back into the environment. Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing. Changes in an organism's habitat are sometimes beneficial to it and sometimes harmful. For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. Populations of organisms live in a variety of habitats, and change in those habitats affects the organisms living there. Humans, like all other organisms, obtain living and nonliving resources from their environments.

- Each force acts on one particular object and has both a strength and a direction. An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can cause changes in the object's speed or direction of motion. Objects in contact exert forces on each other. The patterns of an object's motion in various situations can be observed and measured. The strengths of forces can be measured and their values compared. The sizes of the forces in each situation depend on the properties of the objects and their distances apart.

- 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

- What regulates weather and climate?
- How do natural hazards affect individuals and societies?
- How can one predict an object's continued motion, changes in motion, or stability?
- What types of forces explain the variety of interactions observed?

- Why are some physical systems more stable than others?
- How do organisms grow and develop?
- How do organisms interact in groups so as to benefit individuals?
- How are the characteristics of one generation related to the previous generations?
- Why do individuals of the same species vary in how they look function, and behave?
- What evidence shows that different species are related?
- How does genetic variation among organisms affect survival and reproduction?
- How does the environment influence populations of organisms over multiple generations?
- What is biodiversity, how do humans affect it, and how does it affect humans?

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

Trimester 1	Unit 1: Earth Systems: Climate and Weather
Trimester 2	Unit 2: Molecules to Organisms (Structure, Function, Heredity)
Trimester 3	Unit 3: Motion and Stability: Forces and Interactions

UNIT 1
Earth Systems: Climate and Weather

Unit Goals

At the completion of this unit, students will:

NGSS.3-ESS2-1	Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.
NGSS.3-ESS2-2	Obtain and combine information to describe climates in different regions of the world.
NGSS.3-ESS3-1	Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.
NGSS.3-LS3-2	Use evidence to support the explanation that traits can be influenced by the environment.
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.
CCS.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.
CCS.ELA-Literacy.RI.3.9	Compare and contrast the most important points and key details presented in two texts on the same topic.
CCS.ELA-Literacy.W.3.1	Write opinion pieces on topics or texts, supporting a point of view with reasons.
CCS.ELA-Literacy.W.3.7	Conduct short research projects that build knowledge about a topic.
CCS.ELA-Literacy.W.3.8	Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.
CCS.Mathematics.MP.2	Reason abstractly and quantitatively.
CCS.Mathematics.MP.3	Construct viable arguments and critique the reasoning of others.

CCS.Mathematics.MP.4	Model with mathematics.
CCS.Mathematics.MP.5	Use appropriate tools strategically.
CCS.Mathematics.MP.6	Attend to precision.
CCS.Mathematics.3.MD.2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.
CCS.Mathematics.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.

Science & Engineering Practices	**Disciplinary Core Ideas**	**Crosscutting Concepts**
Analyzing and Interpreting Data: • Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships. (NGSS.3-ESS2-1) Obtaining, Evaluating, and Communicating Information: • Obtain and combine information from books and other reliable media to explain phenomena. (NGSS.3-ESS2-2) Engaging in Argument from Evidence: • Make a claim about the merit of a solution to a problem by citing relevant	ESS3.D: Weather and Climate: • Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (NGSS.3-ESS2-1) • Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (NGSS.3-ESS2-2) ESS3.B: Natural Hazards: • A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce	Patterns: • Patterns of change can be used to make predictions. (NGSS.3-ESS2-1, NGSS.3-ESS2-2) Cause and Effect: • Cause and effect relationships are routinely identified, tested, and used to explain change. (NGSS.3-ESS3-1) Connections to Engineering, Technology, and Applications of Science: Influence of Science, Engineering, and Technology on Society and the Natural World: • Engineers improve existing technologies or develop

evidence about how it meets the criteria and constraints of the problem. (NGSS.3-ESS3-1)	their impacts. (NGSS.3-ESS3-1)	new ones to increase their benefits (e.g., better artificial limbs), decrease known risks (e.g., seatbelts in cars), and meet societal demands (e.g., cell phones). (NGSS.3-ESS3-1) Connections to Nature of Science: Science Is a Human Endeavor: • Science affects everyday life. (NGSS.3-ESS3-1)

Unit Essential Questions

- What regulates weather and climate?
- How do natural hazards affect individuals and societies?

Scope and Sequence

- Phenomenon: Weather affects humans every day!
- What can air do?
- What happens when air is pushed into a smaller space?
- How can water be used to show that air takes up space?
- What is weather?
- What does a thermometer tell us about the weather?
- What types of clouds are in the sky?
- Where does rain come from, and where does it go?
- How strong is the wind?
- What does a wind vane tell us about the wind?
- How can we compare the number of days of different kinds of weather?
- What can we learn from studying weather condition data from the same area across multiple seasons (e.g., average temperature, precipitation, wind direction)?
- What are the local weather patterns over a year?

Assured Assessments

Formative Assessment:

- Class discussions
- Collaborative investigations
- Science Notebooks
- Diagrams

Summative Assessment:

- Investigation 1: Icheck Exploring Air
- Investigation 2: Icheck Weather
- Investigation 4: Icheck Change
- End-of-unit Assessment: Climate and Weather
- Reflection on STEM application

Resources

Core

- *Air and Weather*, FOSS Science.
- *Air and Weather*. Nashua, NH: Delta Education, 2003. Print.

Supplemental

- Carson, Mary Kay. *Inside Hurricanes*. New York: Sterling, 2010. Print.
- dePaola, Tomie. *The Cloud Book*. New York: Holiday House, 1975. Print.
- Lauber, Patricia. *Hurricanes: Earth's Mightiest Storms*. New Yokr: Houghton Mifflin, 2000. Print.
- London, Jonathan, and Henri Sorensen. *Hurricane!* New York: HarperCollins, 1998. Print.
- Pitino, Donna Marie. *The Water Cycle*. Waterbury, CT: Abrams, 2007. Print.
- Ring, Susan. *Looking at Clouds*. London: Newbridge, 1999. Print.
- Rockwell, Anne. *Clouds*. New York: HarperCollins, 2008. Print.
- Wallner, Alexandra. *Sergio and the Hurricane*. New York: Holt, 2000. Print.
- BrainPOP.com. https://www.brainpop.com/. Web.
- National Geographic Kids. https://kids.nationalgeographic.com/. Web.
- National Hurricane Center. https://www.nhc.noaa.gov/. Web.
- National Oceanic and Atmospheric Administration. "Satellite and Information Service." https://www.nesdis.noaa.gov/. Web.
- Spaceweather.com. http://spaceweather.com/. Web.

Time Allotment

- Trimester 1

Units 2-3 follow a draft structure for the 2018-19 school year, with Unit Goals & Time Allotment included below, and the remainder of each unit plan to be developed during the 2018-19 school year under the leadership of the Coordinator of STEM K-8.

UNIT 2

Molecules to Organisms (Structure, Function, Heredity)

Unit Goals

At the completion of this unit, students will:

NGSS.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.
NGSS.3-LS2-1	Construct an argument that some animals form groups that help members survive.
NGSS.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.
NGSS.3-LS3-2	Use evidence to support the explanation that traits can be influenced by the environment.
NGSS.3-LS4-1	Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.
NGSS.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.
NGSS.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.
NGSS.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.
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.

CCS.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.
CCS.ELA-Literacy.RI.3.2	Determine the main idea of a text; recount the key details and explain how they support the main idea.
CCS.ELA-Literacy.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.
CCS.ELA-Literacy.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).
CCS.ELA-Literacy.W.3.1	Write opinion pieces on topics or texts, supporting a point of view with reasons.
CCS.ELA-Literacy.W.3.2	Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
CCS.ELA-Literacy.W.3.8	Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.
CCS.ELA-Literacy.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.
CCS.ELA-Literacy.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.
CCS.Mathematics.MP.1	Make sense of problems and persevere in solving them.
CCS.Mathematics.MP.2	Reason abstractly and quantitatively.
CCS.Mathematics.MP.3	Construct viable arguments and critique the reasoning of others.

CCS.Mathematics.MP.4	Model with mathematics.
CCS.Mathematics.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.
CCS.Mathematics.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.

Science & Engineering Practices	**Disciplinary Core Ideas**	**Crosscutting Concepts**
Developing and Using Models: • Develop models to describe phenomena. (NGSS.3-LS1-1) Engaging in Argument from Evidence: • Construct an argument with evidence, data, and/or a model. (NGSS.3-LS2-1) Analyzing and Interpreting Data: • Analyze and interpret data to make sense of phenomena using logical reasoning. (NGSS.3-LS4-1) Constructing Explanations and Designing Solutions: • Use evidence (e.g., observations, patterns) to construct an explanation. (NGSS.3-LS4-2) Engaging in Argument from Evidence: • Construct an argument with evidence. (NGSS.3-LS4-3)	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. (NGSS.3-LS1-1) 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. (NGSS.3-LS2-1) LS3.A: Inheritance of Traits: • Many characteristics of organisms are inherited from their parents. (NGSS.3-LS3-1) • Other characteristics result from individuals' interactions with the environment, which can range from diet to learning.	Patterns: • Patterns of change can be used to make predictions. (NGSS.3-LS1-1) • Similarities and differences in patterns can be used to sort and classify natural phenomena. (NGSS.3-LS3-1) Cause and Effect: • Cause and effect relationships are routinely identified and used to explain change. (NGSS.3-LS2-1) Systems and System Models: • A system can be described in terms of its components and their interactions. (NGSS.3-LS4-4) Connections to Engineering, Technology, and Applications of Science: Interdependence of Science, Engineering, and Technology: • Knowledge of relevant

• 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. (NGSS.3-LS4-4) Connections to Nature of Science: Scientific Knowledge Is Based on Empirical Evidence: • Science findings are based on recognizing patterns. (NGSS.3-LS1-1)	Many characteristics involve both inheritance and environment. (NGSS.3-LS3-2) LS3.B: Variation of Traits: • Different organisms vary in how they look and function because they have different inherited information. (NGSS.3-LS3-1) • The environment also affects the traits that an organism develops. (NGSS.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. (NGSS.3-LS4-2) LS4.C: Adaptation: • For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (NGSS.3-LS4-3) 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	scientific concepts and research findings is important in engineering. (NGSS.3-LS4-4)

	environment, and some die. (secondary to NGSS.3-LS4-4) LS4.D: Biodiversity and Humans: • Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (NGSS.3-LS4-4)	

Time Allotment

- Trimester 2

UNIT 3
Motion and Stability: Forces and Interactions

Unit Goals

At the completion of this unit, students will:

NGSS.3-PS2-1	Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
NGSS.3-PS2-2	Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.
NGSS.3-PS2-3	Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.
NGSS.3-PS2-4	Define a simple design problem that can be solved by applying scientific ideas about magnets.
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.3.1	Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
CCS.ELA-Literacy.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.
CCS.ELA-Literacy.RI.3.8	Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence).
CCS.ELA-Literacy.W.3.7	Conduct short research projects that build knowledge about a topic.
CCS.ELA-Literacy.W.3.8	Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.

CCS.ELA-Literacy.SL.3.3	Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
CCS.Mathematics.MP.2	Reason abstractly and quantitatively.
CCS.Mathematics.MP.3	Construct viable arguments and critique the reasoning of others.
CCS.Mathematics.MP.4	Model with mathematics.
CCS.Mathematics.MP.5	Use appropriate tools strategically.
CCS.Mathematics.MP.6	Attend to precision.
CCS.Mathematics.3.MD.2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

Science & Engineering Practices	**Disciplinary Core Ideas**	**Crosscutting Concepts**
Asking Questions and Defining Problems: • Ask questions that can be investigated based on patterns such as cause and effect relationships. (NGSS.3-PS2-3) • Define a simple problem that can be solved through the development of a new or improved object or tool. (NGSS.3-PS2-4) Planning and Carrying Out Investigations: • Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are	PS2.A: Forces and Motion: • Each force acts on one particular object and has both strength and a direction. An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can cause changes in the object's speed or direction of motion. (NGSS.3-PS2-1) • The patterns of an object's motion in various situations can be observed and measured; when that past motion exhibits a regular pattern, future motion can be predicted	Patterns: • Patterns of change can be used to make predictions. (NGSS.3-PS2-2) Cause and Effect: • Cause and effect relationships are routinely identified. (NGSS.3-PS2-1) • Cause and effect relationships are routinely identified, tested, and used to explain change. (NGSS.3-PS2-3) Connections to Engineering, Technology, and Applications of Science: Interdependence of Science,

controlled and the number of trials considered. (NGSS.3-PS2-1) • Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (NGSS.3-PS2-2)	from it. (NGSS.3-PS2-2) LS2.B: Types of Interactions: • Objects in contact exert forces on each other. (NGSS.3-PS2-1) • Electric and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other. (NGSS.3-PS2-3, NGSS.3-PS2-4)	Engineering, and Technology: • Scientific discoveries about the natural world can often lead to new and improved technologies, which are developed through the engineering design process. (NGSS.3-PS2-4)

Time Allotment

- Trimester 3