Kenilworth Public Schools

Curriculum Guide

Content Area: Science
Grade: 3
BOE Approved: 7/11/2016

Revision Date: March 2022
Submitted by: Tammy Smith
BOE Revision Approved: 4/11/22

Science- Grade 3 Scope and Sequence

Unit 1- Motion and Matter	Unit 2- Water and Climate	Unit 3- Structures of Life
Weeks 1-6	Weeks 13-18	Weeks 25- 32
Unit Description: Students explore the forces all around them. They investigate the effects of balanced and unbalanced forces, the pushes and pulls of bridge structures, and the effects of friction on the motion of objects. Students also explore the power of magnetic forces and investigate firsthand how these forces can be used to help us in our everyday lives. Students will engage in science and engineering practices to collect data to answer questions, and to define problems in order to develop solutions.	*Unit Description:* Students investigate and make predictions about the weather through careful observation of the clouds and wind. Students discover how water is involved in weather through exploration on properties of water, the water cycle, and interactions between water and other earth materials. Students also learn to differentiate between weather and climate and use models to reveal global climate patterns.	*Unit Description:* Students develop an understanding of how animals and their environments change through time. Fossils provide a window into the animals and habitats of the past. Analyzing the traits of animals provides evidence for how those traits vary, how they are inherited, and how they have changed over time. Students also examine how the environment can affect inherited traits and determine which animals will survive in a particular environment.
Unit Targets: • Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object. • Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion. • Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other. • Define a simple design problem that can be solved by applying scientific ideas about magnets.	*Unit Targets:* • Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. • Obtain and combine information to describe climates in different regions of the world. • Make a claim about the merit of a design solution that reduces the impacts of climate change and/or a weather-related hazard. • Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. • Generate and compare multiple possible	*Unit Targets:* • Develop models to describe that organisms have unique and diverse life cycles, but all have in common birth, growth, reproduction, and death. • Construct an argument that some animals form groups that help members survive. • 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. • Use evidence to support the explanation that traits can be influenced by the environment. • Analyze and interpret data from fossils to

	solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. • 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.	provide evidence of the organisms and the environments in which they lived long ago. • 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. • 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. • 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.

Science- Grade 3- Earth Science Unit

Unit Title: Water and Climate

Unit Summary: Students investigate and make predictions about the weather through careful observation of the clouds and wind. Students discover how water is involved in weather through exploration on properties of water, the water cycle, and interactions between water and other earth materials. Students also learn to differentiate between weather and climate and use models to reveal global climate patterns.

Primary Interdisciplinary Connections: Math: 3.MD.A.2; 3.MD.B.3; 3-5.OA
ELA: RI.3.1; W.3.7

Career Readiness, Life Literacies, and Key Skills: Critical Thinking and Problem-Solving, Information and Media Literacy
9.4.5.CT.1; 9.4.5.CT.2; 9.4.5.CT.3; 9.4.5.IML.3; 9.4.5.IML.2; 9.4.5.CT.1; 9.4.5.CT.4

Learning Targets

NJSLS Standards: 3-ESS2-1; 3-ESS2-2; 3-ESS3-1; 3-5-ETS1-1; 3-5-ETS1-2; 3-5-ETS1-3

Computer Science and Design Thinking Standards: Data analysis: 8.1.2.DA.1; 8.1.5.DA.1; 8.1.8.DA.1;

Climate Change Standards: 3-ESS2-2; 3-ESS3-1

Content Statements:

1	Water Cycle and Phases of Matter
2	Climate/Geography and Global Weather Patterns/Weather Prediction
3	Natural Hazards and Engineering

Big Idea: Weather is driven by the sun and is dominated by the movement of water through the water cycle. Water is involved in weather. Weather conditions vary around the world and throughout the year

Unit Essential Questions:

- Where do clouds come from?
- Why does condensation form and what does it have to do weather?
- How can we predict when it's going to storm?
- Is it warmer in the summer and cooler in the winter everywhere in the United States? Why are some places always hot?
- How can you keep a house from blowing away in a windstorm?

Unit Enduring Understandings:

- Water expands when heated and contracts when cooled.
- Strong winds can cause lots of damage. Engineers design ideas and solutions to the problems until they find a solution.
- Evaporation and condensation contribute to the movement of water through the water cycle.
- The Sun's energy drives weather.
- The energy of flowing water can be used to do work.

Unit Learning Targets
Students who demonstrate understanding can:

- Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. [Clarification Statement: Examples of data could include average temperature, precipitation, and wind direction.] [Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change.]
- Obtain and combine information to describe climates in different regions of the world.
- Make a claim about the merit of a design solution that reduces the impacts of climate change and/or a weather-related hazard. [Clarification Statement: Examples of design solutions to weather-related hazards could include barriers to prevent flooding, wind resistant roofs, and lightning rods.]
- Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 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.
- 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.

Evidence of Learning

Summative Assessment: Investigation 3- 4 -ICheck and Unit Test and Mystery Science Story Skies Unit Test and Performance Task

Formative Assessments:

- Focus Questions 3.1- 3.5 in Science Journal
- Focus Questions 4.1- 4.3 in Science Journal
- Lab Recording Sheets from all Investigations 3-4
- Mystery Science Story Skies Lessons 1-4 Check-Ins and Lab Recording Sheets (Mystery Science) including anchor phenomenon
- Anchor Phenomenon Worksheet

Lesson Plans

Activities/Interdisciplinary Connections	*Timeframe*
• Mystery Science Stormy Skies Unit: Lessons 1-4 (including anchor phenomenon and performance task) • Foss Science Weather and Climate Kit- Investigation 3: Weather and Water: Lessons 1-5 • Foss Science Weather and Climate Kit- Investigation 4: Seasons and Climate: Lessons 1-3	(3 weeks) (3 weeks)
Teacher Resources	*Teacher Note*

• Mysterysciene.com • Foss Science Readers • Science Notebooks • Schoolwide Science Non-fiction Readers • Technology Tools: -Google Classroom -BrainPOP -FlipGrid -Kahoot -Quizizz -Foss Web (See this list for more ideas from the NJDOE) (See this list for Kenilworth Tools and Platforms)	Video lessons Teacher prep materials to be printed for each lesson

Differentiating Instruction: Students with Disabilities, English Language Learners, and Gifted & Talented Students

Examples of Strategies and Practices that Support Students with Disabilities:
• Use of visual and multisensory formats
• Use of assisted technology
• Use of prompts
• Modification of content and student products
• Testing accommodations
• Authentic assessments

Examples of Strategies and Practices that Support Gifted & Talented Students:
• Adjusting the pace of lessons
• Curriculum compacting
• Inquiry-based instruction
• Independent study
• Higher-order thinking skills
• Interest-based content
• Student-driven instruction
• Real-world problems and scenarios

Examples of Strategies and Practices that Support English Language Learners:
• Pre-teaching of vocabulary and concepts
• Visual learning, including graphic organizers
• Use of cognates to increase comprehension
• Teacher modeling
• Pairing students with beginning English language skills with students who have more advanced English language skills

- Scaffolding
- Word walls
- Sentence frames
- Think-pair-share
- Cooperative learning groups

Science- Grade 3- Physical Science

Unit Title: Motion, Matter and Invisible Forces

Unit Summary: Students explore the forces all around them. They investigate the effects of balanced and unbalanced forces, the pushes and pulls of bridge structures, and the effects of friction on the motion of objects. Students also explore the power of magnetic forces and investigate firsthand how these forces can be used to help us in our everyday lives. Students will engage in science and engineering practices to collect data to answer questions, and to define problems in order to develop solutions.

Primary Interdisciplinary Connections: ELA: RI.3.1; RI.3.3; W.3.7;
Math: 3.MD.A.2; 3.NB; 3.NF

Career Readiness, Life Literacies, and Key Skills: Creativity and Innovation, Critical Thinking and Problem Solving, Information and Media Literacy
9.4.5.CI.1; 9.4.5.CI.2; 9.4.5.CI.3; 9.4.5.CI.4; 9.4.5.CT.1; 9.4.5.CT.2; 9.4.5.CT.3; 9.4.5.IML.1; 9.4.5.IML.3

Learning Targets

NJSLS Standards: 3-PS2-1; 3-PS2-2; 3-PS2-3; 3-PS2-4

Computer Science and Design Thinking Standards: Data and Analysis: 8.1.5.DA.1; 8.1.5.DA.2; 8.1.5.DA.3; 8.1.5.DA.4; 8.1.5.DA.5
Engineer and Design: 8.2.5.ED.1; 8.2.5.ED.2: 8.2.5.ED.3:

Content Statements:

1	Balanced and Unbalanced Forces
2	Balanced Forces and Engineering
3	Friction and Pattern of Motion
4	Magnets and Forces

Big Idea: Pushes and pulls are forces that cause things to change how they are moving. Magnets can create some of these pushes and pulls, while friction another force produces resistance. Different materials have different strengths and weaknesses when used to push or pull.

Unit Essential Questions:

- What happens when magnets interact with other magnets?
- How could you win a tug of war against a bunch of adults?
- What causes a change of motion?
- How can you go faster down a slide?
- What makes bridges so strong?

Unit Enduring Understandings:

- The strength of the magnetic force between objects depends on the properties of the objects and their distances apart.
- Every action is a push or a pull, or what is called a force.
- Unbalanced forces (pushes or pulls) result in change of motion.

• How can some objects push or pull some objects without touching? • How can we use observed patterns of motion to design solutions to engineering problems?	• Friction is a special force that can move an object faster or slower depending on the objects it is in contact with. • The patterns of an object's motion in various situations can be observed and measured. • The success of a designed solution is determined by considering the desired features of a solution (criteria)

Unit Learning Targets

Students who demonstrate understanding can…

- Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object. [Clarification Statement: Examples could include an unbalanced force on one side of a ball can make it start moving; and, balanced forces pushing on a box from both sides will not produce any motion at all. Qualitative and conceptual, but not quantitative addition of forces, are used at this level. [Assessment Boundary: Assessment is limited to one variable at a time: number, size, or direction of forces. Assessment does not include quantitative force size, only qualitative and relative. Assessment is limited to gravity being addressed as a force that pulls objects down.]
- Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion. [Clarification Statement: Examples of motion with a predictable pattern could include a child swinging in a swing, a ball rolling back and forth in a bowl, and two children on a see-saw.] [Assessment Boundary: Assessment does not include technical terms such as period and frequency.]
- Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other. [Clarification Statement: Examples of an electric force could include the force on hair from an electrically charged balloon and the electrical forces between a charged rod and pieces of paper; examples of a magnetic force could include the force between two permanent magnets, the force between an electromagnet and steel paperclips, and the force exerted by one magnet versus the force exerted by two magnets. Examples of cause and effect relationships could include how the distance between objects affects strength of the force and how the orientation of magnets affects the direction of the magnetic force.] [Assessment Boundary: Assessment is limited to forces produced by objects that can be manipulated by students, and electrical interactions are limited to static electricity.]
- Define a simple design problem that can be solved by applying scientific ideas about magnets. [Clarification Statement: Examples of problems could include constructing a latch to keep a door shut and creating a device to keep two moving objects from touching each other.]

Evidence of Learning

Summative Assessment: Investigation 1, 2, and 3-ICheck and Mystery Science Unit Test and Performance Task for Mystery Science

Formative Assessments:

- Mystery Science Invisible Forces Lessons 1-5 Check In Quizzes and Lab recording sheets

- Focus Questions 1.1- 1.3 in Science Journals
- Focus Questions 2.1- 2.4 in Science Journals
- Focus Questions 3.1- 3.4 in Science Journals
- Lab Recording Sheets for Investigations 1-3

Lesson Plans

Activities/Interdisciplinary Connections	*Timeframe*
• Mystery Science Unit: Invisible Forces Lesson 1-5, including anchor phenomenon • Foss Science: Motion and Matter Investigation 1- Lessons 1-3 • Foss Science: Motion and Matter Investigation 2- Lessons 1-4 • Foss Science: Motion and Matter Investigation 3- Lessons 1-4	(2 weeks) (4 weeks)
Teacher Resources	*Teacher Note*
• Mysterscience.com website and lesson videos • Foss Science: Science Stories Readers • School Wide Science Stories • Technology Tools -Google Classroom -BrainPOP -Kahoot -Quizizz -Fossweb.com interactive lesson activities/video (See this list for more ideas from the NJDOE) (See this list for Kenilworth Tools and Platforms)	Mystery science printable lesson pages printed from website for reproducibles for lesson)

Differentiating Instruction: Students with Disabilities, English Language Learners, and Gifted & Talented Students

Examples of Strategies and Practices that Support Students with Disabilities:
• Use of visual and multisensory formats
• Use of assisted technology
• Use of prompts
• Modification of content and student products
• Testing accommodations
• Authentic assessments

Examples of Strategies and Practices that Support Gifted & Talented Students:
• Adjusting the pace of lessons
• Curriculum compacting
• Inquiry-based instruction
• Independent study
• Higher-order thinking skills
• Interest-based content
• Student-driven instruction
• Real-world problems and scenarios

Examples of Strategies and Practices that Support English Language Learners:
• Pre-teaching of vocabulary and concepts
• Visual learning, including graphic organizers
• Use of cognates to increase comprehension
• Teacher modeling
• Pairing students with beginning English language skills with students who have more advanced English language skills
• Scaffolding
•Word walls
•Sentence frames
•Think-pair-share
•Cooperative learning groups

Science – Grade 3- Life Science

Unit Title: Structures of Life

Unit Summary: Students develop an understanding of how animals and their environments change through time. Fossils provide a window into the animals and habitats of the past. Analyzing the traits of animals provides evidence for how those traits vary, how they are inherited, and how they have changed over time. Students also examine how the environment can affect inherited traits and determine which animals will survive in a particular environment.

Primary Interdisciplinary Connections: ELA: RI.3.1; RI.3.3; RI.3.7; W.3.1; W.3.2; Math: 3.NBT; 3.NF; 3.MD.B.4; 3.MD.B.3

Career Readiness, Life Literacies, and Key Skills: Information and Media Literacy: 9.4.5.IML.1; 9.4.5.IML.3

Learning Targets

NJSLS Standards: • 3-LS1-1; 3-LS2-1; 3-LS3-1; 3-LS3-2; 3-LS4-1; 3-LS4-2; 3-LS4-3; 3-LS4-4

Computer Science and Design Thinking Standards: Data Analysis: 8.1.5.DA.1; 8.1.5.DA.2; 8.1.5.DA.3; 8.1.5.DA.4; 8.1.5.DA.5

Content Statements:

1	Habitats, Fossils, and Environments Over Time
2	Fossil Evidence and Classification
3	Trace Fossils and Animal Behavior
4	Trait Variation, Natural Selection and Survival
5	Animal Groups and Survival
6	Environmental Change and Engineering
7	Traits and Environmental Variation

Big Idea: Habitats change over time by way of living things or natural processes. This can cause living things in those habitats to change too. Fossils provide evidence of how living things used to look and behave and also provide evidence about the habitats in which those living things existed.

Unit Essential Questions:	**Unit Enduring Understandings:**
• What are the characteristics of animals that allow populations of animals to survive and reproduce in an environment? • How are characteristics similar to and different from parents to offspring? • What can we learn about animals of the	• All living organisms have specific characteristics in common. • Plants and animals have different structures that serve different functions in growth, survival and reproduction. • Plants and animals have life cycles and they

past from looking at their skeletons? • What kind of animals might there be in the future? • Can selection happen without people?	vary by species. • The number and kinds of bones in an organism are characteristics inherited from the parent or organisms

Unit Learning Targets (copy/paste indicators from NJSLS)
Students who demonstrate understanding can…

- Develop models to describe that organisms have unique and diverse life cycles, but all have in common birth, growth, reproduction, and death. [Clarification Statement: Changes organisms go through during their life form a pattern.] [Assessment Boundary: Assessment of plant life cycles is limited to those of flowering plants. Assessment does not include details of human reproduction.]
- Construct an argument that some animals form groups that help members survive.
- Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms. [Clarification Statement: Patterns are the similarities and differences in traits shared between offspring and their parents, or among siblings. Emphasis is on organisms other than humans.] [Assessment Boundary: Assessment does not include genetic mechanisms of inheritance and prediction of traits. Assessment is limited to non-human examples.]
- Use evidence to support the explanation that traits can be influenced by the environment. [Clarification Statement: Examples of the environment affecting a trait could include normally tall plants grown with insufficient water are stunted; and, a pet dog that is given too much food and little exercise may become overweight.].
- Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago. [Clarification Statement: Examples of data could include type, size, and distributions of fossil organisms. Examples of fossils and environments could include marine fossils found on dry land, tropical plant fossils found in Arctic areas, and fossils of extinct organisms.] [Assessment Boundary: Assessment does not include identification of specific fossils or present plants and animals. Assessment is limited to major fossil types and relative ages.]
- Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. [Clarification Statement: Examples of cause and effect relationships could be plants that have larger thorns than other plants may be less likely to be eaten by predators; and, animals that have better camouflage coloration than other animals may be more likely to survive and therefore more likely to leave offspring.]
- Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all. [Clarification Statement: Examples of evidence could include needs and characteristics of the organisms and habitats involved. The organisms and their habitat make up a system in which the parts depend on each other.]
- Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change. [Clarification Statement: Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms.] [Assessment Boundary: Assessment is

limited to a single environmental change. Assessment does not include the greenhouse effect or climate change.]

Evidence of Learning

Summative Assessment: Investigation 1, 2, 3 and 4-ICheck and Animals Through Time Unit Test

Formative Assessments:

- Mystery Science: Animals Through Time Lesson 1-8 Check Ins
- Mystery Science: Animals Through Time Lessons 1-8 Lab Recording Sheets

Lesson Plans

Activities/Interdisciplinary Connections	*Timeframe*
• Mystery Science: Animals Through Time Unit- Lessons 1-8 (including anchor phenomenon)	(All lesson reproducibles printed from Mysteryscience.com)
Teacher Resources	*Teacher Note*
• Technology Tools (add/delete as appropriate): -Google Classroom -BrainPOP -Kahoot -Quizizz -Fossweb.com -Foss Science Life Structures Kit -Owl Pellets -Mystery Science Video Lessons (See this list for more ideas from the NJDOE) (See this list for Kenilworth Tools and Platforms)	

Differentiating Instruction: Students with Disabilities, English Language Learners, and Gifted & Talented Students

Examples of Strategies and Practices that Support Students with Disabilities:

- Use of visual and multisensory formats
- Use of assisted technology
- Use of prompts
- Modification of content and student products
- Testing accommodations
- Authentic assessments

Examples of Strategies and Practices that Support Gifted & Talented Students:

• Adjusting the pace of lessons
• Curriculum compacting
• Inquiry-based instruction
• Independent study
• Higher-order thinking skills
• Interest-based content
• Student-driven instruction
• Real-world problems and scenarios

Examples of Strategies and Practices that Support English Language Learners:
• Pre-teaching of vocabulary and concepts
• Visual learning, including graphic organizers
• Use of cognates to increase comprehension
• Teacher modeling
• Pairing students with beginning English language skills with students who have more advanced English language skills
• Scaffolding
•Word walls
•Sentence frames
•Think-pair-share
•Cooperative learning groups