Science
Grade 1

CURRICULUM GUIDE
Approved
Date
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Mr. David C. Mango, Superintendent
Ms. Debra Grigoletti, Director of Curriculum & Instruction

Developed by:
Colleen Schubert
Jennifer Daly

This curriculum may be modified through varying techniques, strategies and materials, as per an individual student's Individualized Education Plan (IEP).

Approved by the Great Meadows Regional Board of Education
at the regular meeting held on August 22, 2017
and
Aligned with the New Jersey Student Learning Standards in Science

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Mission Statement

Building on tradition and success, the mission of the Great Meadows Regional School District is to educate and inspire students through school, family, and community partnerships so that all become positive, contributing members of a global society, with a life-long commitment to learning.

It is the expectation of this school district that all pupils achieve the New Jersey Student Learning Standards at all grade levels.

Philosophy and Rationale

Science, engineering, and technology increasingly influence every aspect of modern life, even for young learners. Understanding science and the extraordinary insights it has produced can be meaningful and relevant on a personal level, opening new worlds to explore and offering lifelong opportunities for enriching students' lives. Well-rounded, innovative, and grade-appropriate content spurs first graders to find their own answers to questions about the natural world, and to learn to find patterns in that world.

Scope and Sequence

Unit 1 - How Scientists Work

Students who understand the concepts can:

- ask questions and define problems
- infer and experiment
- follow directions for an investigation to use the sense of touch to identify objects
- plan and conduct an investigation to compare objects using a balance
- use the five senses as tools to observe
- compare observations with others
- follow directions for an investigation to use inquiry skills such as measuring
- plan and conduct an investigation to use inquiry skills such as making models.
- raise questions about the natural world and investigate them
- plan and carry out an investigation based on questions asked
- generate appropriate explanations based on the investigation
- follow directions for an investigation to compare a set amount of liquid in different containers using the scientific method
- plan and conduct an investigation to study fingerprints using a scientific process

Time Allotment: 1/10th of the school year

Unit 2 - Technology All Around Us

Students who understand the concepts can:

- follow directions for an investigation to use the design process to build a landing pad for an egg
- plan and conduct an investigation to use the design process to build a paper airplane
- follow the steps of the design process
- solve a real-world problem
- follow directions for an investigation to make a piece of artwork, and identify its natural and human-made materials
- plan and conduct an investigation to classify natural and human-made classroom materials
- use the five senses to observe objects
- identify objects as being made from human-made or natural materials or a combination of the two
- explain the reasons behind the decision to sort a certain way

Time Allotment: 1/10th of the school year

Unit 3 - Animals

Students who understand the concepts can:

- follow directions for an investigation to make a model as a way to differentiate between living and nonliving things
- plan and conduct an investigation to observe and classify living and nonliving things in an environment
- follow directions for an investigation to observe what mealworms need to live and grow
- plan and conduct an investigation to identify how local birds meet their need for food
- use the steps of the engineering design process to design or improve on the design of a tool
- apply the scientific concepts of scale and measurement
- follow directions for an investigation to sort animals by a variety of physical characteristics
- plan and conduct an investigation to observe animals in books and classify them by their observable characteristics
- observe differences in physical properties
- classify animals by a variety of physical characteristics
- record observations made in a chart

Time Allotment: 1/10th of the school year

Unit 4 - Plants

Students who understand the concepts can:

- follow directions for an investigation to observe whether plants grow toward light
- plan and conduct an investigation to observe how water moves through a plant
- raise questions about plants and investigate them
- ask “how do you know?”
- predict and investigate growth of plants when growing conditions are altered
- observe that all plants share the same basic needs
- explain that a plant will die if its basic needs are not met
- follow directions for an investigation to observe the differences between plant parts such as seeds
- plan and conduct an investigation to observe plant parts
- follow directions for an investigation to compare leaves from different kinds of plants by making rubbings
- plan and conduct an investigation to compare flowers from different kinds of plants
- observe leaves from three different plants
- measure and compare the size of a leaf from each plant using nonstandard units
- compare leaves by a variety of physical characteristics
- communicate what you have learned by drawing or writing
- use the steps of the engineering design process to design and make a model of a greenhouse

- apply the scientific concepts of systems and system models and form and function

Time Allotment: 1/10th of the school year

Unit 5 - Environments

Students who understand the concepts can:

- follow directions for an investigation to observe animal and plant interdependence by modeling a food chain
- plan and conduct an investigation to make a pet care plan
- collect, record, and compare information using science tools to support observations of living things in their environment
- explain that a terrarium has all of the things that plants and animals need to survive
- analyze and record examples of interdependence found in various situations such as terrariums
- gather evidence of interdependence among living organisms
- use the steps of the engineering design process to design a butterfly sanctuary
- apply the scientific concepts of systems and system models and form and function

Time Allotment: 1/10th of the school year

Unit 6 - Earth's Resources

Students who understand the concepts can:

- follow directions for an investigation to learn about natural resources by making bricks out of clay
- plan and conduct an investigation to learn about how humans use natural resources such as plants
- follow directions for an investigation to compare rocks using a balance
- plan and conduct an investigation to compare how much water different soils can hold
- recognize that rocks are natural materials
- describe some common properties of rocks
- sort rocks into groups based on observable properties
- make and record observations
- identify the components of soil
- observe and describe the properties of soil
- compare a variety of soil samples
- follow directions for an investigation to find out whether plants grow better in salt water or fresh water
- plan and conduct an investigation to record daily water use
- follow directions for an investigation to find out how land pollution affects plant growth

- plan and conduct an investigation to identify and sort recyclable classroom items
- use the steps of the engineering design process to list ways to cut down on car use and reduce air pollution
- apply the scientific concepts of cause and effect: mechanism and prediction

Time Allotment: 1/10th of the school year

Unit 7 - Weather and Seasons

Students who understand the concepts can:

- follow directions for an investigation to find out how temperature changes during the day
- plan and conduct an investigation to build and observe the effects of wind on a pinwheel
- observe and record the weather for a period of five days
- record in pictures the results of an investigation
- draw conclusions and communicate the results of an investigation
- follow directions for an investigation to find out how fur protects animals from the cold
- plan and conduct an investigation to identify how trees may change in different seasons
- use the steps of the engineering design process to design and build a rain gauge
- apply the scientific concepts of scale and measurement

Time Allotment: 1/10th of the school year

Unit 8 - Objects in the Sky

Students who understand the concepts can:

- follow directions for an investigation to observe the sun's apparent location in the sky at different times of day
- plan and conduct an investigation to make a model of stars in the sky
- follow directions for an investigation to simulate Earth's rotation
- plan and conduct an investigation to observe the phases of the moon
- investigate how shadows change during the day
- observations are repeated to assure accuracy
- measure the length of each shadow using nonstandard units
- record in words, pictures, and numbers investigation results
- draw conclusions and communicate the results of an investigation
- use the steps of the engineering design process to design a lighting plan for a baseball park
- apply the scientific concepts of form and function

Time Allotment: 1/10th of the school year

Unit 9 - All About Matter

Students who understand the concepts can:

- follow directions for an investigation to sort objects by physical properties such as size, shape, color, and texture
- plan and conduct an investigation to compare objects by physical properties such as weight
- follow directions for an investigation to use water, a cup, and a paper towel to observe liquids and gases
- plan and conduct an investigation to observe the liquid and solid properties of a cornstarch mixture
- sort objects based on temperature
- determine that dark colors make things warmer
- use a thermometer to measure temperature
- follow directions for an investigation to study changes in matter by identifying substances that dissolve or separate in water
- plan and conduct an investigation to change matter in different ways
- determine which solids dissolve more readily in hot water than cold water
- make observations, perform an investigation to answer a question, and record and communicate results
- make and confirm predictions based on an investigation
- use the steps of the engineering design process to improve on the design of a toothbrush, comb, or lunchbox
- apply the scientific concepts of form and function

Time Allotment: 1/10th of the school year

Unit 10 - Forces and Energy

Students who understand the concepts can:

- follow directions for an investigation to find out how fast marbles move through different liquids
- plan and conduct an investigation to test how different toys move
- follow directions for an investigation to move a ball in different ways
- plan and conduct an investigation to move a tissue ball through a maze without touching it
- investigate by pushing or pulling objects to see how they respond
- demonstrate that applying a push or pull changes the motion of an object
- follow directions for an investigation to make sounds of different pitch using water-filled bottles
- plan and conduct an investigation to build and make sounds on a model drum
- demonstrate how sound is made
- make observations, perform an investigation to answer a question, and record and communicate the results
- make inferences and draw conclusions

- use the steps of the engineering design process to design, build, and test paper airplanes that will fly far
- apply the scientific concepts of form and function

Time Allotment: 1/10th of the school year

Unit 1 - How Scientists Work
Stage 1: Desired Results

Content Standards:

- **SEP - Asking Questions and Defining Problems:** Ask questions based on observations to find more information about the natural and/or designed world(s) (K-2-ETS1-1)
- **SEP - Analyzing and Interpreting Data:** Analyzing data in K-2 builds on prior experiences and processes to collecting, recording, and sharing observations

Essential Questions:
- What are senses and other tools?
- What are, and how do we use, inquiry skills?

Enduring Understandings:
- There are five senses: touch, sight, hearing, smell, and taste.
- Children can identify an object using their senses singularly or simultaneously.
- Conclusions can be drawn based on observations.

Knowledge and Skills: (SWBAT embedded course proficiencies)

Students who understand the concepts can:
- ask questions and define problems
- infer and experiment
- follow directions for an investigation to use the sense of touch to identify objects
- plan and conduct an investigation to compare objects using a balance
- use the five senses as tools to observe
- compare observations with others
- follow directions for an investigation to use inquiry skills such as measuring
- plan and conduct an investigation to use inquiry skills such as making models
- raise questions about the natural world and investigate them
- plan and carry out an investigation based on questions asked
- generate appropriate explanations based on the investigation
- follow directions for an investigation to compare a set amount of liquid in different containers using the scientific method
- plan and conduct an investigation to study fingerprints using a scientific process

Stage 2: Evidence of Understanding, Learning Objectives and Expectations

Benchmarks (embedded student proficiencies)

Assessment Methods Science Lab activities, student notebook recordings, student graphs and models, Teacher Observation

Stage 3: Learning Plan

In this unit, students will learn that scientists use inquiry skills and tools to help them find out information. To meet learning objectives, students will participate in inquiry-based investigations using a multi-sensory approach. Additionally, print content in the format of a student workbook and digital access through the Think Central dashboard will allow students to direct their own learning path at their own pace. Leveled readers that reinforce scientific concepts will be made available.

Additional support to the learning process will be accomplished through the use of Scholastic News, online and print media; Scholastic Core Clicks; Brain Pop Jr.; Discovery Network for virtual field trips; and YouTube for videos and clips.

As first graders, students need multiple opportunities to develop investigation and inquiry skills. Students will use their prior knowledge to guide their skillsets. Unit vocabulary will be introduced, practiced, and guided for fluency. **Relevant vocabulary for this unit, in order of appearance: senses, science tools, inquiry skills, investigation**

Connecting with English Language Arts/Literacy and Mathematics

English Language Arts/Literacy

English Language Arts can be leveraged in this unit in a number of ways. Students can participate in shared research using trade books and online resources to learn about the five senses and science tools used to explore their world. Students can record their findings in science journals or use the research to write and illustrate their own books. Students can also learn to take notes in their journals in order to help them recall information from experiences or gather information from provided sources. They can add drawings or other visual displays to their work, when appropriate, to clarify ideas, thoughts, and feelings.

Mathematics

Throughout this unit of study, students will have opportunities to represent and interpret data by using "The Standards for Mathematical Practice," which will assist them in making sense of problems and persevere in solving them. Students will demonstrate how to reason abstractly and quantitatively. They will be provided with guidance on how to construct viable arguments and critique the reasoning of others. Modeling with mathematics will be encouraged, as well as using appropriate tools strategically. They will attend to precision, look for and make use of structure, and

look for and express regularity in repeated reasoning. All of the above will lead to opportunities to create and analyze each science topic at a grade-appropriate level.

Modifications

- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, and modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various groups.
- Engage students with a variety of Science and Engineering practices to provide students with multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable outcomes.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.

Time Allotment: 1/10 of the school year

Resources - Sample Open Education Resources

Suggested resources will include but are not limited to the following:

- District approved science textbook
- Assessments
- Websites
- Videos
- Nonfiction/fiction sources
- Laboratory investigations
- STEM/STEAM activities

Unit 2 - Technology All Around Us

Stage 1: Desired Results

Content Standards:

- **SEP - Asking Questions and Defining Problems:** Define a simple problem that can be solved through the development of a new or improved tool (K-2-ETS1-1)
- **SEP - Developing and Using Models:** Develop a simple model based on evidence to represent a proposed object or tool (K-2-ETS1-2)

- **SEP - Analyzing and Interpreting Data:** Analyze data from tests of an object or tool to determine if it works as intended (K-2-ETS1-3)
- K-2-ETS1.A.1: A situation that people want to change or create can be approached as a problem to be solved through engineering
- K-2-ETS1.A.2: Asking questions, making observation, and gathering information are helpful in thinking about problems
- K-2-ETS1.A.3: Before beginning to design a solution, if is important to clearly understand the problem
- K-2-ETS1.B.1: Designs can be conveyed through sketches, drawing, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.
- K-2-ETS1.C.1: Because there is always more than one possible solution to a problem, it is useful to compare and test designs

Essential Questions:
- Who are engineers and how do they work?
- How can we solve a problem?

Enduring Understandings:
- Children understand how to identify a problem and a solution.
- Problems can be solved in more than one way.
- The design process of an solution should be analyzed for effectiveness.

Knowledge and Skills (SWBAT embedded course proficiencies)

Students who understand the concepts can:
- follow directions for an investigation to use the design process to build a landing pad for an egg
- plan and conduct an investigation to use the design process to build a paper airplane
- follow the steps of the design process
- solve a real-world problem
- follow directions for an investigation to make a piece of artwork, and identify its natural and human-made materials
- plan and conduct an investigation to classify natural and human-made classroom materials
- use the five senses to observe objects
- identify objects as being made from human-made or natural materials or a combination of the two
- explain the reasons behind the decision to sort a certain way

Stage 2: Evidence of Understanding, Learning Objectives and Expectations

Assessment Methods (formative, summative, other evidence and/or student self-assessment) Science Lab activities, student notebook recordings, student learning experiences, Teacher Observations

Stage 3: Learning Plan

In this unit, students will learn that engineers use a process to design and build something new. They use many different kinds of materials. To meet learning objectives, students will participate in inquiry-based investigations using a multi-sensory approach. Additionally, print content in the format of a student workbook and digital access through the Think Central dashboard will allow students to direct their own learning path at their own pace. Leveled readers that reinforce scientific concepts will be made available.

Additional support to the learning process will be accomplished through the use of Scholastic News, online and print media; Scholastic Core Clicks; Brain Pop Jr.; Discovery Network for virtual field trips; and YouTube for videos and clips.

As first graders, students need multiple opportunities to develop investigation and inquiry skills. Students will use their prior knowledge to guide their skillsets. Unit vocabulary will be introduced, practiced, and guided for fluency. **Relevant vocabulary for this unit, in order of appearance: engineer, design process, materials, natural, human-made**

Connecting with English Language Arts/Literacy and Mathematics

English Language Arts/Literacy

English Language Arts can be leveraged in this unit in a number of ways. Students can participate in shared research using trade books and online resources to learn about how engineers use technology, as well as how the student can learn how to solve problems. Students can record their findings in science journals or use the research to write and illustrate their own books. Students can also learn to take notes in their journals in order to help them recall information from experiences or gather information from provided sources. They can add drawings or other visual displays to their work, when appropriate, to clarify ideas, thoughts, and feelings.

Mathematics

Throughout this unit of study, students will have opportunities to represent and interpret data by using "The Standards for Mathematical Practice," which will assist them in making sense of problems and persevere in solving them. Students will demonstrate how to reason abstractly and quantitatively. They will be provided with guidance on how to construct viable arguments and critique the reasoning of others. Modeling with mathematics will be encouraged, as well as using appropriate tools strategically. They will attend to precision, look for and make use of structure, and look for and express regularity in repeated reasoning. All of the above will lead to opportunities to create and analyze each science topic at a grade-appropriate level.

Modifications

- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, and modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various groups.
- Engage students with a variety of Science and Engineering practices to provide students with multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable outcomes.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.

Time Allotment: 1/10 of the school year

Resources

Suggested resources will include but are not limited to the following:

- District approved science textbook
- Assessments
- Websites
- Videos
- Nonfiction/fiction sources
- Laboratory investigations
- STEM/STEAM activities

Unit 3 - Animals

Stage 1: Desired Results

Content Standards:

- 1-L.S1.A.1: All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.
- 1-LS1.B.1: Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring

to survive.

Essential Questions:

- What are living and nonliving things?
- What do animals need?

Enduring Understandings:

- Living and nonliving things have different needs.
- Some animals eat more/less of certain foods.
- Animals can be classified into groups based on characteristics.
- Movement is related to body parts.

Knowledge and Skills (SWBAT embedded course proficiencies)

Students who understand the concepts can:

- follow directions for an investigation to make a model as a way to differentiate between living and nonliving things
- plan and conduct an investigation to observe and classify living and nonliving things in an environment
- follow directions for an investigation to observe what mealworms need to live and grow
- plan and conduct an investigation to identify how local birds meet their need for food
- use the steps of the engineering design process to design or improve on the design of a tool
- apply the scientific concepts of scale and measurement
- follow directions for an investigation to sort animals by a variety of physical characteristics
- plan and conduct an investigation to observe animals in books and classify them by their observable characteristics
- observe differences in physical properties
- classify animals by a variety of physical characteristics
- record observations made in a chart

Stage 2: Evidence of Understanding, Learning Objectives and Expectations

Assessment Methods (formative, summative, other evidence and/or student self-assessment) Science Lab activities, student notebook recordings, student learning experiences, Teacher Observations

Stage 3: Learning Plan

In this unit, students will learn that all animals have to meet needs in order to live and grow. There are many different kinds of animals. They are grouped by their traits. To meet learning objectives, students will participate in inquiry-based investigations using a multi-sensory approach. Additionally, print content in the format of a student workbook

and digital access through the Think Central dashboard will allow students to direct their own learning path at their own pace. Leveled readers that reinforce scientific concepts will be made available.

Additional support to the learning process will be accomplished through the use of Scholastic News, online and print media; Scholastic Core Clicks; Brain Pop Jr.; Discovery Network for virtual field trips; and YouTube for videos and clips.

As first graders, students need multiple opportunities to develop investigation and inquiry skills. Students will use their prior knowledge to guide their skillsets. Unit vocabulary will be introduced, practiced, and guided for fluency. **Relevant vocabulary for this unit, in order of appearance: living, reproduce, nonliving, environment, gills, shelter, mammal, bird, reptile, amphibian, fish, insect**

Connecting with English Language Arts/Literacy and Mathematics

English Language Arts/Literacy

English Language Arts can be leveraged in this unit in a number of ways. Students can participate in shared research using trade books and online resources to learn about living and nonliving things, as well as what animals need, how they are different and how to group animals. Students can record their findings in science journals or use the research to write and illustrate their own books. Students can also learn to take notes in their journals in order to help them recall information from experiences or gather information from provided sources. They can add drawings or other visual displays to their work, when appropriate, to clarify ideas, thoughts, and feelings.

Mathematics

Throughout this unit of study, students will have opportunities to represent and interpret data by using “The Standards for Mathematical Practice,” which will assist them in making sense of problems and persevere in solving them. Students will demonstrate how to reason abstractly and quantitatively. They will be provided with guidance on how to construct viable arguments and critique the reasoning of others. Modeling with mathematics will be encouraged, as well as using appropriate tools strategically. They will attend to precision, look for and make use of structure, and look for and express regularity in repeated reasoning. All of the above will lead to opportunities to create and analyze each science topic at a grade-appropriate level.

Modifications

- Structure lessons around questions that are authentic, relate to students’ interests, social/family background and knowledge of their community.
- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures,

illustrations, graphs, charts, data tables, and modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various groups.
- Engage students with a variety of Science and Engineering practices to provide students with multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable outcomes.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.

Time Allotment: 1/10 of the school year

Resources

Suggested resources will include but are not limited to the following:
- District approved science textbook
- Assessments
- Websites
- Videos
- Nonfiction/fiction sources
- Laboratory investigations
- STEM/STEAM activities

Unit 4 - Plants

Stage 1: Desired Results

Content Standards:
- **CCC - Structure and Function:** The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)
- 1-LS1.A.1: All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1)

Essential Questions:
- What do plants need to grow?
- What are some parts of a plant?

Enduring Understandings:
- Plants need water, air, and light to grow.

- Plants transport water through their stems to their leaves.
- Different seeds produce different plants.
- Some plant parts do not appear on all plants.

Knowledge and Skills (SWBAT embedded course proficiencies)

Students who understand the concepts can:

- follow directions for an investigation to observe whether plants grow toward light
- plan and conduct an investigation to observe how water moves through a plant
- raise questions about plants and investigate them
- ask “how do you know?”
- predict and investigate growth of plants when growing conditions are altered
- observe that all plants share the same basic needs
- explain that a plant will die if its basic needs are not met
- follow directions for an investigation to observe the differences between plant parts such as seeds
- plan and conduct an investigation to observe plant parts
- follow directions for an investigation to compare leaves from different kinds of plants by making rubbings
- plan and conduct an investigation to compare flowers from different kinds of plants
- observe leaves from three different plants
- measure and compare the size of a leaf from each plant using nonstandard units
- compare leaves by a variety of physical characteristics
- communicate what you have learned by drawing or writing
- use the steps of the engineering design process to design and make a model of a greenhouse
- apply the scientific concepts of systems and system models and form and function

Stage 2: Evidence of Understanding, Learning Objectives and Expectations

Assessment Methods (formative, summative, other evidence and/or student self-assessment) Science Lab activities, student notebook recordings, student learning experiences, Teacher Observations

Stage 3: Learning Plan

In this unit, students will learn that plants have parts to help them meet their basic needs. There are many different kinds of plants. To meet learning objectives, students will participate in inquiry-based investigations using a multi-sensory approach. Additionally, print content in the format of a student workbook and digital access through the Think Central dashboard will allow students to direct their own learning path at their own pace. Leveled readers that reinforce scientific concepts will be made available.

Additional support to the learning process will be accomplished through the use of

Scholastic News, online and print media; Scholastic Core Clicks; Brain Pop Jr.; Discovery Network for virtual field trips; and YouTube for videos and clips.

As first graders, students need multiple opportunities to develop investigation and inquiry skills. Students will use their prior knowledge to guide their skillsets. Unit vocabulary will be introduced, practiced, and guided for fluency. **Relevant vocabulary for this unit, in order of appearance: sunlight, soil, nutrients, root, stem, leaf, flower, seed, fruit, cone**

Connecting with English Language Arts/Literacy and Mathematics

English Language Arts/Literacy

English Language Arts can be leveraged in this unit in a number of ways. Students can participate in shared research using trade books and online resources to learn about plants, what they need to grow, their special parts, as well as how plants are different from other plants. Students can record their findings in science journals or use the research to write and illustrate their own books. Students can also learn to take notes in their journals in order to help them recall information from experiences or gather information from provided sources. They can add drawings or other visual displays to their work, when appropriate, to clarify ideas, thoughts, and feelings.

Mathematics

Throughout this unit of study, students will have opportunities to represent and interpret data by using "The Standards for Mathematical Practice," which will assist them in making sense of problems and persevere in solving them. Students will demonstrate how to reason abstractly and quantitatively. They will be provided with guidance on how to construct viable arguments and critique the reasoning of others. Modeling with mathematics will be encouraged, as well as using appropriate tools strategically. They will attend to precision, look for and make use of structure, and look for and express regularity in repeated reasoning. All of the above will lead to opportunities to create and analyze each science topic at a grade-appropriate level.

Modifications

- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, and modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various groups.

- Engage students with a variety of Science and Engineering practices to provide students with multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable outcomes.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.

Time Allotment: 1/10 of the school year

Resources

Suggested resources will include but are not limited to the following:

- District approved science textbook
- Assessments
- Websites
- Videos
- Nonfiction/fiction sources
- Laboratory investigations
- STEM/STEAM activities

Unit 5 - Environments

Stage 1: Desired Results

Content Standards:

- **CCC - Structure and Function:** The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)
- **SEP - Developing and Using Models:** Develop a simple model based on evidence to represent a proposed object or tool (K-2-ETS1-2)
- **SEP - Analyzing and Interpreting Data:** Analyze data from tests of an object or tool to determine if it works as intended (K-2-ETS1-3)
- **SEP - Planning and Carrying Out Investigations:** Plan and conduct investigations collaboratively to produce data to serve as the basis for evidence to answer a question.

Essential Questions:

- Where do plants and animals live?
- What is a terrarium?

Enduring Understandings:

- Plants use sunlight to make food.
- Animals need food, shelter, water, air, and space.
- Different environments support different forms of life.

Knowledge and Skills (SWBAT embedded course proficiencies)

Students who understand the concepts can:

- follow directions for an investigation to observe animal and plant interdependence by modeling a food chain
- plan and conduct an investigation to make a pet care plan
- collect, record, and compare information using science tools to support observations of living things in their environment
- explain that a terrarium has all of the things that plants and animals need to survive
- analyze and record examples of interdependence found in various situations such as terrariums
- gather evidence of interdependence among living organisms
- use the steps of the engineering design process to design a butterfly sanctuary
- apply the scientific concepts of systems and system models and form and function

Stage 2: Evidence of Understanding, Learning Objectives and Expectations

Assessment Methods (formative, summative, other evidence and/or student self-assessment) Science Lab activities, student notebook recordings, student learning experiences, Teacher Observations

Stage 3: Learning Plan

In this unit, students will learn that environments can be found all over Earth. A living things lives in an environment that meets its needs. To meet learning objectives, students will participate in inquiry-based investigations using a multi-sensory approach. Additionally, print content in the format of a student workbook and digital access through the Think Central dashboard will allow students to direct their own learning path at their own pace. Leveled readers that reinforce scientific concepts will be made available.

Additional support to the learning process will be accomplished through the use of Scholastic News, online and print media; Scholastic Core Clicks; Brain Pop Jr.; Discovery Network for virtual field trips; and YouTube for videos and clips.

As first graders, students need multiple opportunities to develop investigation and inquiry skills. Students will use their prior knowledge to guide their skillsets. Unit vocabulary will be introduced, practiced, and guided for fluency. **Relevant vocabulary for this unit, in order of appearance: environment, shelter, food chain**

Connecting with English Language Arts/Literacy and Mathematics

English Language Arts/Literacy

English Language Arts can be leveraged in this unit in a number of ways. Students can participate in shared research using trade books and online resources to learn about environments, what helps plants and animals survive, what keeps them safe, how their

needs are met, as well as how plants and animals respond to their environment. Students can record their findings in science journals or use the research to write and illustrate their own books. Students can also learn to take notes in their journals in order to help them recall information from experiences or gather information from provided sources. They can add drawings or other visual displays to their work, when appropriate, to clarify ideas, thoughts, and feelings.

Mathematics

Throughout this unit of study, students will have opportunities to represent and interpret data by using "The Standards for Mathematical Practice," which will assist them in making sense of problems and persevere in solving them. Students will demonstrate how to reason abstractly and quantitatively. They will be provided with guidance on how to construct viable arguments and critique the reasoning of others. Modeling with mathematics will be encouraged, as well as using appropriate tools strategically. They will attend to precision, look for and make use of structure, and look for and express regularity in repeated reasoning. All of the above will lead to opportunities to create and analyze each science topic at a grade-appropriate level.

Modifications

- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, and modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various groups.
- Engage students with a variety of Science and Engineering practices to provide students with multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable outcomes.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.

Time Allotment: 1/10 of the school year

Resources

Suggested resources will include but are not limited to the following:

- District approved science textbook

- Assessments
- Websites
- Videos
- Nonfiction/fiction sources
- Laboratory investigations
- STEM/STEAM activities

Unit 6 - Earth's Resources
Stage 1: Desired Results

Content Standards:

- K-2-ETS1.A.1: A situation that people want to change or create can be approached as a problem to be solved through engineering
- K-2-ETS1.A.2: Asking questions, making observation, and gathering information are helpful in thinking about problems
- K-2-ETS1.A.3: Before beginning to design a solution, if is important to clearly understand the problem
- K-2-ETS1.B.1: Designs can be conveyed through sketches, drawing, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people .
- K-2-ETS1.C.1: Because there is always more than one possible solution to a problem, it is useful to compare and test designs

Essential Questions:

- What can we find on Earth?
- How can we save resources?

Enduring Understandings:

- Different soils hold different water amounts.
- Rocks have different traits.
- People use water in different ways.
- Land pollution negatively affects grass.
- There are many ways to reduce pollution.

Knowledge and Skills (SWBAT embedded course proficiencies)

Students who understand the concepts can:

- follow directions for an investigation to learn about natural resources by making bricks out of clay
- plan and conduct an investigation to learn about how humans use natural resources such as plants
- follow directions for an investigation to compare rocks using a balance
- plan and conduct an investigation to compare how much water different soils can

hold
- recognize that rocks are natural materials
- describe some common properties of rocks
- sort rocks into groups based on observable properties
- make and record observations
- identify the components of soil
- observe and describe the properties of soil
- compare a variety of soil samples
- follow directions for an investigation to find out whether plants grow better in salt water or fresh water
- plan and conduct an investigation to record daily water use
- follow directions for an investigation to find out how land pollution affects plant growth
- plan and conduct an investigation to identify and sort recyclable classroom items
- use the steps of the engineering design process to list ways to cut down on car use and reduce air pollution
- apply the scientific concepts of cause and effect: mechanism and prediction

Stage 2: Evidence of Understanding, Learning Objectives and Expectations

Assessment Methods (formative, summative, other evidence and/or student self-assessment) Science Lab activities, student notebook recordings, student learning experiences, Teacher Observations

Stage 3: Learning Plan

In this unit, students will learn that there are many kinds of resources on Earth and that individuals can help save Earth's resources. To meet learning objectives, students will participate in inquiry-based investigations using a multi-sensory approach. Additionally, print content in the format of a student workbook and digital access through the Think Central dashboard will allow students to direct their own learning path at their own pace. Leveled readers that reinforce scientific concepts will be made available.

Additional support to the learning process will be accomplished through the use of Scholastic News, online and print media; Scholastic Core Clicks; Brain Pop Jr.; Discovery Network for virtual field trips; and YouTube for videos and clips.

As first graders, students need multiple opportunities to develop investigation and inquiry skills. Students will use their prior knowledge to guide their skillsets. Unit vocabulary will be introduced, practiced, and guided for fluency. **Relevant vocabulary for this unit, in order of appearance: engineer, design process, materials, natural, human-made**

Connecting with English Language Arts/Literacy and Mathematics

English Language Arts/Literacy

English Language Arts can be leveraged in this unit in a number of ways. Students can participate in shared research using trade books and online resources to learn about Earth's resources, rocks and soil, as well as where we can find water. Students can record their findings in science journals or use the research to write and illustrate their own books. Students can also learn to take notes in their journals in order to help them recall information from experiences or gather information from provided sources. They can add drawings or other visual displays to their work, when appropriate, to clarify ideas, thoughts, and feelings.

Mathematics

Throughout this unit of study, students will have opportunities to represent and interpret data by using "The Standards for Mathematical Practice," which will assist them in making sense of problems and persevere in solving them. Students will demonstrate how to reason abstractly and quantitatively. They will be provided with guidance on how to construct viable arguments and critique the reasoning of others. Modeling with mathematics will be encouraged, as well as using appropriate tools strategically. They will attend to precision, look for and make use of structure, and look for and express regularity in repeated reasoning. All of the above will lead to opportunities to create and analyze each science topic at a grade-appropriate level.

Modifications

- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, and modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various groups.
- Engage students with a variety of Science and Engineering practices to provide students with multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable outcomes.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.

Time Allotment: 1/10 of the school year

Resources

Suggested resources will include but are not limited to the following:

- District approved science textbook
- Assessments
- Websites
- Videos
- Nonfiction/fiction sources
- Laboratory investigations
- STEM/STEAM activities

Unit 7 - Weather and Seasons

Stage 1: Desired Results

Content Standards:

- **CCC - Patterns**: Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.
- **SEP - Analyzing and Interpreting Data:** Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.

Essential Questions:

- What is weather?
- What are seasons?

Enduring Understandings:

- There are temperature patterns that can be affected by variations in weather conditions.
- Weather patterns can aid in making weather predictions.
- Tools can be used in weather observation.
- Weather changes with each season.

Knowledge and Skills (SWBAT embedded course proficiencies)

Students who understand the concepts can:

- follow directions for an investigation to find out how temperature changes during the day
- plan and conduct an investigation to build and observe the effects of wind on a pinwheel
- observe and record the weather for a period of five days
- record in pictures the results of an investigation
- draw conclusions and communicate the results of an investigation
- follow directions for an investigation to find out how fur protects animals from the cold

- plan and conduct an investigation to identify how trees may change in different seasons
- use the steps of the engineering design process to design and build a rain gauge
- apply the scientific concepts of scale and measurement

Stage 2: Evidence of Understanding, Learning Objectives and Expectations

Assessment Methods (formative, summative, other evidence and/or student self-assessment)Science Lab activities, student notebook recordings, student learning experiences, Teacher Observations

Stage 3: Learning Plan

In this unit, students will learn that weather changes from day to day and from season to season. Different tools can be used to measure the weather. To meet learning objectives, students will participate in inquiry-based investigations using a multi-sensory approach. Additionally, print content in the format of a student workbook and digital access through the Think Central dashboard will allow students to direct their own learning path at their own pace. Leveled readers that reinforce scientific concepts will be made available.

Additional support to the learning process will be accomplished through the use of Scholastic News, online and print media; Scholastic Core Clicks; Brain Pop Jr.; Discovery Network for virtual field trips; and YouTube for videos and clips.

As first graders, students need multiple opportunities to develop investigation and inquiry skills. Students will use their prior knowledge to guide their skillsets. Unit vocabulary will be introduced, practiced, and guided for fluency. **Relevant vocabulary for this unit, in order of appearance: wind, weather, temperature, season, weather pattern**

Connecting with English Language Arts/Literacy and Mathematics

English Language Arts/Literacy

English Language Arts can be leveraged in this unit in a number of ways. Students can participate in shared research using trade books and online resources to learn about weather and seasons, as well as observe weather and seasons in our area. Students can record their findings in science journals or use the research to write and illustrate their own books. Students can also learn to take notes in their journals in order to help them recall information from experiences or gather information from provided sources. They can add drawings or other visual displays to their work, when appropriate, to clarify ideas, thoughts, and feelings.

Mathematics

Throughout this unit of study, students will have opportunities to represent and interpret

data by using "The Standards for Mathematical Practice," which will assist them in making sense of problems and persevere in solving them. Students will demonstrate how to reason abstractly and quantitatively. They will be provided with guidance on how to construct viable arguments and critique the reasoning of others. Modeling with mathematics will be encouraged, as well as using appropriate tools strategically. They will attend to precision, look for and make use of structure, and look for and express regularity in repeated reasoning. All of the above will lead to opportunities to create and analyze each science topic at a grade-appropriate level.

Modifications

- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, and modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various groups.
- Engage students with a variety of Science and Engineering practices to provide students with multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable outcomes.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.

Time Allotment: 1/10 of the school year

Resources

Suggested resources will include but are not limited to the following:

- District approved science textbook
- Assessments
- Websites
- Videos
- Nonfiction/fiction sources
- Laboratory investigations
- STEM/STEAM activities

Unit 8 - Objects in the Sky
Stage 1: Desired Results

Content Standards:

- **CCC - Patterns:** Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.
- **SEP - Analyzing and Interpreting Data:** Analyze data from tests of an object or tool to determine if it works as intended (K-2-ETS1-3)
- 1-PS4.B.1.: Objects can be seen if light is available to illuminate them or if they give off their own light
- 1-ESS1.A.1: Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted.

Essential Questions:

- What can we see in the sky?
- How does the sky seem to change?

Enduring Understandings:

- The sun's position seems to change throughout the day.
- The moon seems to change shape (phases) in a repeating pattern.
- The sun's position in the sky affects the length and position of shadows.

Knowledge and Skills (SWBAT embedded course proficiencies)

Students who understand the concepts can:

- follow directions for an investigation to observe the sun's apparent location in the sky at different times of day
- plan and conduct an investigation to make a model of stars in the sky
- follow directions for an investigation to simulate Earth's rotation
- plan and conduct an investigation to observe the phases of the moon
- investigate how shadows change during the day
- observations are repeated to assure accuracy
- measure the length of each shadow using nonstandard units
- record in words, pictures, and numbers investigation results
- draw conclusions and communicate the results of an investigation
- use the steps of the engineering design process to design a lighting plan for a baseball park
- apply the scientific concepts of form and function

Stage 2: Evidence of Understanding, Learning Objectives and Expectations

Assessment Methods (formative, summative, other evidence and/or student self-assessment)Science Lab activities, student notebook recordings, student learning experiences, Teacher Observations

Stage 3: Learning Plan

In this unit, students will learn that the sun warms land, air, and water. The appearance of objects in the sky changes. To meet learning objectives, students will participate in inquiry-based investigations using a multi-sensory approach. Additionally, print content in the format of a student workbook and digital access through the Think Central dashboard will allow students to direct their own learning path at their own pace. Leveled readers that reinforce scientific concepts will be made available.

Additional support to the learning process will be accomplished through the use of Scholastic News, online and print media; Scholastic Core Clicks; Brain Pop Jr.; Discovery Network for virtual field trips; and YouTube for videos and clips.

As first graders, students need multiple opportunities to develop investigation and inquiry skills. Students will use their prior knowledge to guide their skillsets. Unit vocabulary will be introduced, practiced, and guided for fluency. **Relevant vocabulary for this unit, in order of appearance: sun, star, moon, magnify, telescope, shadow phases**

Connecting with English Language Arts/Literacy and Mathematics

English Language Arts/Literacy

English Language Arts can be leveraged in this unit in a number of ways. Students can participate in shared research using trade books and online resources to learn about how objects in the sky seem to change, as well as exploring the patterns of daylight. Students can record their findings in science journals or use the research to write and illustrate their own books. Students can also learn to take notes in their journals in order to help them recall information from experiences or gather information from provided sources. They can add drawings or other visual displays to their work, when appropriate, to clarify ideas, thoughts, and feelings.

Mathematics

Throughout this unit of study, students will have opportunities to represent and interpret data by using “The Standards for Mathematical Practice,” which will assist them in making sense of problems and persevere in solving them. Students will demonstrate how to reason abstractly and quantitatively. They will be provided with guidance on how to construct viable arguments and critique the reasoning of others. Modeling with mathematics will be encouraged, as well as using appropriate tools strategically. They will attend to precision, look for and make use of structure, and look for and express regularity in repeated reasoning. All of the above will lead to opportunities to create and analyze each science topic at a grade-appropriate level.

Modifications

- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, and modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various groups.
- Engage students with a variety of Science and Engineering practices to provide students with multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable outcomes.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.

Time Allotment: 1/10 of the school year

Resources

Suggested resources will include but are not limited to the following:

- District approved science textbook
- Assessments
- Websites
- Videos
- Nonfiction/fiction sources
- Laboratory investigations
- STEM/STEAM activities

Unit 9 - All About Matter
Stage 1: Desired Results

Content Standards:

- **SEP - Constructing Explanations and Designing Solutions:** Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena
- **SEP - Planning and Carrying Out Investigations:** Make observations (firsthand or from media) to collect data that can be used to make comparisons
- K-2-ETS1.A.2: Asking questions, making observations, and gathering information are helpful in thinking about problems

Essential Questions:

- What are solids, liquids, and gases?
- How can matter change?

Enduring Understandings:

- Matter is anything that takes up space and has mass.
- Matter can change.
- Objects can be described and classified based on their properties.

Knowledge and Skills (SWBAT embedded course proficiencies)

Students who understand the concepts can:

- follow directions for an investigation to sort objects by physical properties such as size, shape, color, and texture
- plan and conduct an investigation to compare objects by physical properties such as weight
- follow directions for an investigation to use water, a cup, and a paper towel to observe liquids and gases
- plan and conduct an investigation to observe the liquid and solid properties of a cornstarch mixture
- sort objects based on temperature
- determine that dark colors make things warmer
- use a thermometer to measure temperature
- follow directions for an investigation to study changes in matter by identifying substances that dissolve or separate in water
- plan and conduct an investigation to change matter in different ways
- determine which solids dissolve more readily in hot water than cold water
- make observations, perform an investigation to answer a question, and record and communicate results
- make and confirm predictions based on an investigation
- use the steps of the engineering design process to improve on the design of a toothbrush, comb, or lunchbox
- apply the scientific concepts of form and function

Stage 2: Evidence of Understanding, Learning Objectives and Expectations

Assessment Methods (formative, summative, other evidence and/or student self-assessment) Science Lab activities, student notebook recordings, student learning experiences, Teacher Observations

Stage 3: Learning Plan

In this unit, students will learn that all objects are matter. Matter can change in different ways. To meet learning objectives, students will participate in inquiry-based investigations using a multi-sensory approach. Additionally, print content in the format of a student workbook and digital access through the Think Central dashboard will allow

students to direct their own learning path at their own pace. Leveled readers that reinforce scientific concepts will be made available.

Additional support to the learning process will be accomplished through the use of Scholastic News, online and print media; Scholastic Core Clicks; Brain Pop Jr.; Discovery Network for virtual field trips; and YouTube for videos and clips.

As first graders, students need multiple opportunities to develop investigation and inquiry skills. Students will use their prior knowledge to guide their skillsets. Unit vocabulary will be introduced, practiced, and guided for fluency. **Relevant vocabulary for this unit, in order of appearance: matter, property, texture, weight, temperature, mass, solid, liquid, gas, mixture, dissolve**

Connecting with English Language Arts/Literacy and Mathematics

English Language Arts/Literacy

English Language Arts can be leveraged in this unit in a number of ways. Students can participate in shared research using trade books and online resources to learn about matter; solids, liquids and gasses. Explore temperature changes and the effect it has on the states of matter. Students can record their findings in science journals or use the research to write and illustrate their own books. Students can also learn to take notes in their journals in order to help them recall information from experiences or gather information from provided sources. They can add drawings or other visual displays to their work, when appropriate, to clarify ideas, thoughts, and feelings.

Mathematics

Throughout this unit of study, students will have opportunities to represent and interpret data by using "The Standards for Mathematical Practice," which will assist them in making sense of problems and persevere in solving them. Students will demonstrate how to reason abstractly and quantitatively. They will be provided with guidance on how to construct viable arguments and critique the reasoning of others. Modeling with mathematics will be encouraged, as well as using appropriate tools strategically. They will attend to precision, look for and make use of structure, and look for and express regularity in repeated reasoning. All of the above will lead to opportunities to create and analyze each science topic at a grade-appropriate level.

Modifications

- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, and modeling).

- Provide opportunities for students to connect with people of similar backgrounds (e.g. experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various groups.
- Engage students with a variety of Science and Engineering practices to provide students with multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable outcomes.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.

Time Allotment: 1/10 of the school year

Resources

Suggested resources will include but are not limited to the following:

- District approved science textbook
- Assessments
- Websites
- Videos
- Nonfiction/fiction sources
- Laboratory investigations
- STEM/STEAM activities

Unit 10 - Forces and Energy

Stage 1: Desired Results

Content Standards:

- **SEP - Constructing Explanations and Designing Solutions:** Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena
- **SEP - Obtaining, Evaluating, and Communicating Information:** Read grade-appropriate texts and use media to obtain scientific information to determine patterns in the natural world.
- 1-PS4.A.1: Sound can make matter vibrate, and vibrating matter can make sound. (1-PS4-1)

Essential Questions:

- How do objects move and how can we change motion?
- What is sound?

Enduring Understandings:

- Objects move in a variety of ways.

- To change motion, force must be applied differently (push vs. pull)
- Sound results from vibration.

Knowledge and Skills (SWBAT embedded course proficiencies)

Students who understand the concepts can:

- follow directions for an investigation to find out how fast marbles move through different liquids
- plan and conduct an investigation to test how different toys move
- follow directions for an investigation to move a ball in different ways
- plan and conduct an investigation to move a tissue ball through a maze without touching it
- investigate by pushing or pulling objects to see how they respond
- demonstrate that applying a push or pull changes the motion of an object
- follow directions for an investigation to make sounds of different pitch using water-filled bottles
- plan and conduct an investigation to build and make sounds on a model drum
- demonstrate how sound is made
- make observations, perform an investigation to answer a question, and record and communicate the results
- make inferences and draw conclusions
- use the steps of the engineering design process to design, build, and test paper airplanes that will fly far
- apply the scientific concepts of form and function

Stage 2: Evidence of Understanding, Learning Objectives and Expectations

Assessment Methods (formative, summative, other evidence and/or student self-assessment)Science Lab activities, student notebook recordings, student learning experiences, Teacher Observations

Stage 3: Learning Plan

In this unit, students will learn that forces change the way objects move. Sound is energy that you hear. To meet learning objectives, students will participate in inquiry-based investigations using a multi-sensory approach. Additionally, print content in the format of a student workbook and digital access through the Think Central dashboard will allow students to direct their own learning path at their own pace. Leveled readers that reinforce scientific concepts will be made available.

Additional support to the learning process will be accomplished through the use of Scholastic News, online and print media; Scholastic Core Clicks; Brain Pop Jr.; Discovery Network for virtual field trips; and YouTube for videos and clips.

As first graders, students need multiple opportunities to develop investigation and inquiry skills. Students will use their prior knowledge to guide their skillsets. Unit

vocabulary will be introduced, practiced, and guided for fluency. **Relevant vocabulary for this unit, in order of appearance: motion, speed, push, pull, force, sound, vibrate, loudness, pitch**

Connecting with English Language Arts/Literacy and Mathematics

English Language Arts/Literacy

English Language Arts can be leveraged in this unit in a number of ways. Students can participate in shared research using trade books and online resources to learn about sound, as well as how to communicate with sound. Students can record their findings in science journals or use the research to write and illustrate their own books. Students can also learn to take notes in their journals in order to help them recall information from experiences or gather information from provided sources. They can add drawings or other visual displays to their work, when appropriate, to clarify ideas, thoughts, and feelings.

Mathematics

Throughout this unit of study, students will have opportunities to represent and interpret data by using "The Standards for Mathematical Practice," which will assist them in making sense of problems and persevere in solving them. Students will demonstrate how to reason abstractly and quantitatively. They will be provided with guidance on how to construct viable arguments and critique the reasoning of others. Modeling with mathematics will be encouraged, as well as using appropriate tools strategically. They will attend to precision, look for and make use of structure, and look for and express regularity in repeated reasoning. All of the above will lead to opportunities to create and analyze each science topic at a grade-appropriate level.

Modifications

- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, and modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various groups.
- Engage students with a variety of Science and Engineering practices to provide students with multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable outcomes.

- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.

Time Allotment: 1/10 of the school year

Resources

Suggested resources will include but are not limited to the following:

- District approved science textbook
- Assessments
- Websites
- Videos
- Nonfiction/fiction sources
- Laboratory investigations
- STEM/STEAM activities

New Jersey Student Learning Standards

http://www.state.nj.us/education/cccs/

http://www.state.nj.us/education/cccs/2016/science/

Next Generation Science Standards

https://www.nextgenscience.org/overview-dci

Integration of 21st Century Theme(s)

The following websites are sources for the following 21st Century Themes and Skills:
http://www.nj.gov/education/code/current/title6a/chap8.pdf
http://www.p21.org/about-us/p21-framework .
http://www.state.nj.us/education/cccs/standards/9/index.html

21st Century Interdisciplinary Themes (into core subjects)
- **Global Awareness**
- **Financial, Economic, Business and Entrepreneurial Literacy**
- **Civic Literacy**
- **Health Literacy**
- **Environmental Literacy**

Learning and Innovation Skills
- **Creativity and Innovation**
- **Critical Thinking and Problem Solving**
- **Communication and Collaboration**

Information, Media and Technology Skills
- **Information Literacy**
- **Media Literacy**
- **ICT (Information, Communications and Technology) Literacy**

Life and Career Skills
- **Flexibility and Adaptability**
- **Initiative and Self-Direction**
- **Social and Cross-Cultural Skills**
- **Productivity and Accountability**
- **Leadership and Responsibility**

Integration of Digital Tools

Classroom computers/laptops
Technology Lab

Other software programs