Fifth Grade
SCIENCE
Curriculum Map

Volusia County Schools

Next Generation Sunshine State Standards
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The Next Generation Sunshine State Standards for science are organized by grade level for grades K-8 and by Bodies of Knowledge for grades 9-12. Eighteen Big Ideas are encompassed in grades K-12 and build in rigor and depth as students advance. Each grade level includes benchmarks from the four Bodies of Knowledge (Nature of Science, Life Science, Earth and Space Science, and Physical Science).

Fifth Grade Overview

Fifth Grade focuses instructional delivery for science within the following twelve (12) Big Ideas/Standards:

**Nature of Science**
- Big Idea 1 – The Practice of Science
- Big Idea 2 – The Characteristics of Scientific Knowledge

**Earth and Space Science**
- Big Idea 5 – Earth in Space and Time
- Big Idea 7 – Earth Systems and Patterns

**Physical Science**
- Big Idea 8 – Properties of Matter
- Big Idea 9 – Changes in Matter
- Big Idea 10 – Forms of Energy
- Big Idea 11 – Energy Transfer and Transformations
- Big Idea 13 – Forces and Changes in Motion

**Life Science**
- Big Idea 14 – Organization and Development of Living Organisms
- Big Idea 15 – Diversity and Evolution of Living Organisms
- Big Idea 17 – Interdependence
# Fifth Grade Instructional Scope and Sequence

*All required and optional assessments are available on Canvas and Eduphoria

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<tr>
<th>Weeks of Instruction</th>
<th>Instructional Scope</th>
<th>Instructional Sequence</th>
<th>Body of Knowledge</th>
<th>5th Grade Assessments</th>
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<td>Introduction to Practice of Science</td>
<td>August 13 – September 7</td>
<td>Nature of Science</td>
<td>05 SMT 1 (8/13 – 8/17)</td>
</tr>
<tr>
<td>Weeks 5 – 7</td>
<td>Space</td>
<td>September 10 – September 28</td>
<td>Space Science</td>
<td>05 VST 1A (9/24 – 9/28)</td>
</tr>
<tr>
<td>Weeks 8 – 13</td>
<td>Earth</td>
<td>October 1 – November 9</td>
<td>Earth Science</td>
<td>05 VST 1B (11/5 – 11/9)</td>
</tr>
<tr>
<td>Weeks 14 – 18</td>
<td>Matter</td>
<td>November 13 – December 19</td>
<td>Physical Science</td>
<td>05 SMT 2 (1/14 – 1/18)</td>
</tr>
<tr>
<td>Weeks 19 – 24</td>
<td>Energy &amp; Motion</td>
<td>December 7 – February 15</td>
<td></td>
<td>05 VST 2 (2/19 – 2/22)</td>
</tr>
<tr>
<td>Week 25</td>
<td>STEM</td>
<td>February 19 – February 22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weeks 26 – 28</td>
<td>Life</td>
<td>February 25 – March 14</td>
<td>Life Science</td>
<td>05 VST 3 (3/11 – 3/14)</td>
</tr>
<tr>
<td>Weeks 29 – 30</td>
<td>Practice of Science</td>
<td>March 25 – April 5</td>
<td>Nature of Science</td>
<td>05 VST 4 (5/20 – 5/31)</td>
</tr>
<tr>
<td>Weeks 31 – 34</td>
<td>Fair Game Practice</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Week 35</td>
<td>SSA Testing</td>
<td></td>
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</tr>
<tr>
<td>Weeks 36 – 38</td>
<td>Nature of Science and STEM</td>
<td></td>
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</tr>
</tbody>
</table>

Depth of Knowledge, Formative Assessment Strategies, and Digital Program Access documents are now available on the Science Canvas site under the Curriculum Maps button.

## What is STEM?

STEM Weeks are periods of time dedicated to the implementation of an interdisciplinary, standards-rich experience that poses an age-appropriate, real-world problem to be solved through collaborative and creative measures.

<table>
<thead>
<tr>
<th>Scientific Literacy</th>
<th>Technological Literacy</th>
<th>Engineering Literacy</th>
<th>Mathematical Literacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>the ability to use scientific knowledge and processes to understand the natural world as well as the ability to participate in decisions that affect it</td>
<td>the ability to know how to use new technologies, understand how new technologies are developed, and have the skills to analyze how new technologies affect us, our nation, and the world</td>
<td>the ability to understand how technologies are developed via the engineering design process using problem-based lessons in a manner that integrates lessons across multiple subjects</td>
<td>the ability to analyze, reason, and communicate ideas effectively to pose, formulate, solve, and interpret solutions to mathematical problems in a variety of situations</td>
</tr>
</tbody>
</table>
### 5E Learning Cycle: An Instructional Model

<table>
<thead>
<tr>
<th>ENGAGEMENT</th>
<th>EXPLORATION</th>
<th>EXPLANATION</th>
<th>ELABORATION</th>
<th>EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>The engagement phase of the model is intended to capture students’ interest and focus their thinking on the concept, process, or skill that is to be learned. During this engagement phase, the teacher is on center stage.</td>
<td>The exploration phase of the model is intended to provide students with a common set of experiences from which to make sense of the concept, process, or skill that is to be learned. During the exploration phase, the students come to center stage.</td>
<td>The explanation phase of the model is intended to grow students' understanding of the concept, process, or skill and its associated academic language. During the explanation phase, the teacher and students share center stage.</td>
<td>The elaboration phase of the model is intended to construct a deeper understanding of the concept, process, or skill through the exploration of related ideas. During the elaboration phase, the teacher and students share center stage.</td>
<td>The evaluation phase of the model is intended to be used during all phases of the learning cycle driving the decision-making process and informing next steps. During the evaluation phase, the teacher and students share center stage.</td>
</tr>
</tbody>
</table>

#### What does the teacher do?
- **create** interest/curiosity
- **elicit** responses that uncover student thinking/prior knowledge (preview/process)
- **remind** students of previously taught concepts that will play a role in new learning
- **familiarize** students with the unit

#### What does the student do?
- **show** interest in the topic
- **reflect and respond** to questions
- **ask** self-reflection questions:
  - What do I already know?
  - What do I want to know?
  - How will I know I have learned the concept, process, or skill?
- **make** connections to past learning experiences

#### Evaluation of Engagement
The role of evaluation during the engagement phase is to gain access to students’ thinking during the pre-assessment event/activity.

Conceptions and misconceptions currently held by students are uncovered during this phase. These outcomes determine the concept, process, or skill to be explored in the next phase of the learning cycle.

#### Evaluation of Exploration
The role of evaluation during the exploration phase is to gather an understanding of how students are progressing towards making sense of a problem and finding a solution. Strategies and procedures used by students during this phase are highlighted during explicit instruction in the next phase.

The concept, process, or skill is formally explained in the next phase of the learning cycle.

#### Evaluation of Explanation
The role of evaluation during the explanation phase is to determine the students’ degree of fluency (accuracy and efficiency) when solving problems. Conceptual understanding, skill refinement, and vocabulary acquisition during this phase are enhanced through new explorations.

The concept, process, or skill is elaborated in the next phase of the learning cycle.

#### Evaluation of Elaboration
The role of evaluation during the elaboration phase is to determine the degree of learning that occurs following a differentiated approach to meeting the needs of all learners.

Application of new knowledge in unique problem solving situations during this phase constructs a deeper and broader understanding.

The concept, process, or skill has been and will be evaluated as part of all phases of the learning cycle.
Refer to this section when formulating an action plan based upon student performance on the beginning- and mid-year progress monitoring tool.

**LIFE SCIENCE**

- plant structures and their functions (food production, support, water/nutrient absorption and transportation, and reproduction)
- plants’ responses to stimuli (heat, light, and gravity)
- reproduction of flowering (seeds) and nonflowering plants such as moss and ferns (spores)
- parts of a flower (e.g., stamen, pistil, ovary, petals, pollen sperm, eggs)
- germination, pollination, fertilization, seed dispersal

**Plant and Animal Classification** (SC.3.L.15.1, SC.3.L.15.2)
- classification of flowering and non-flowering plants into major groups (those who produce seeds and those who produce spores)
- classification of animals into vertebrates (fish, mammals, birds, reptiles, amphibians) and invertebrates (only arthropods) according to physical characteristics and behaviors (e.g., those which give live birth vs. those which lay eggs, cold-blooded vs. warm-blooded, lungs vs. gills)

**Heredity** (SC.4.L.16.2, SC.4.L.16.3)
- characteristics (traits) of plants are inherited by offspring from parents (e.g., type of plant, color of flower, leaf shape, size)
- characteristics (traits) of animals are inherited by offspring from parents (e.g., freckles, height, dimples, eye color)
- characteristics (traits) of animals are learned/acquired by the environment (e.g., hair color and length, playing an instrument, reading)
- examples of animal behaviors may be shaped by heredity or learning
  - instinctive behaviors: hibernation, migration, hunting, protecting young
  - learned behaviors: using tools, language, hunting, playing sports, writing

**Plant and Animal Life Cycles** (SC.4.L.16.4)
- life cycle of flowering and non-flowering plants (seed, seedling, mature adult, reproduction)
- life cycle of insects that go through complete metamorphosis/4-stages (egg, larva, pupa, adult)
- life cycle of insects that go through incomplete metamorphosis/3-stages (egg, nymph, adult)
- life cycle of animals (egg, embryo, infant, adolescent, adult)

**Seasonal Changes** (SC.3.L.17.1, SC.4.L.17.1)
- animals respond (are adapted) to changing seasons (e.g., clothing, hibernation, migration, shedding, birth, color change)
- seasonal changes (e.g., dormancy, leaves changing color and falling) in Florida plants compared to those in other regions of the country
- seasonal changes (e.g., color change, body covering change, hibernation, migration) in Florida animals compared to those in other regions of the country

- energy is transferred from the sun through a food chain (flow of energy)
- plants are producers that make their own food using carbon dioxide, water, and energy from the sun
- animals are consumers that obtain energy from the plants and/or animals they eat
- types of consumers (carnivore, herbivore, omnivore)
**EARTH SCIENCE**

- physical properties of common earth-forming minerals (hardness, color, luster, cleavage, and streak color)
- role of minerals in the formation of rocks
- three categories of rocks (igneous → formed from molten rock; sedimentary → pieces of other rocks/sediment cemented together and fossilized organisms; metamorphic → formed from heat and pressure)

**Renewable and Nonrenewable Resources** (SC.4.E.6.3, SC.4.E.6.6)
- renewable and nonrenewable resources found on Earth
- natural resources found in Florida (water, phosphate, oil, limestone, silica, wind, and solar energy)

**Weathering and Erosion** (SC.4.E.6.4)
- process of physical weathering (breaking down of rock by wind, water, ice, temperature change, and plants)
- process of erosion (movement of rock by gravity, wind, water, and ice)

**Heat Loss/Heat Gain** (SC.3.E.6.1)
- energy from the sun can heat objects (heat gain) and when the sun is not present, heat may be lost (heat loss).
- sun’s presence, visible or not visible, will impact objects (e.g., size, shape, state, color, temperature).

**PHYSICAL SCIENCE**

**Volume and Water Displacement** (SC.3.P.8.2)
- measure volume of solids by calculating the amount of water displaced in a container (graduated cylinder)
- used for both regular and irregular shapes (wooden cube, shell, rock, coin, marble, dice)

**Heat Flow** (SC.4.P.11.1)
- heat flows from a hot object to a cold object and that heat flow may cause materials to change temperature.

Resources that may support the review and remediation of these concepts throughout the school year include, but are not limited to, the following:

- Pearson Resources
- SRE: Science inSpire (support located on Canvas)
- Making LIFE Easier (lessons located on Canvas)
- Florida Achieves FOCUS (support located on Canvas)
NGSSS BODY OF KNOWLEDGE: NATURE OF SCIENCE

Unit of Study: Introduction to Practice of Science

PACING: Weeks 1 – 4 (19 days)  August 13 – September 7

Prerequisite Learning

<table>
<thead>
<tr>
<th>Grade</th>
<th>Prerequisite Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kindergarten</td>
<td>SC.K.N.1.1, SC.K.N.1.2, SC.K.N.1.3, SC.K.N.1.4, SC.K.N.1.5</td>
</tr>
<tr>
<td>First Grade</td>
<td>SC.1.N.1.1, SC.1.N.1.2, SC.1.N.1.3, SC.1.N.1.4, SC.1.E.5.3</td>
</tr>
<tr>
<td>Second Grade</td>
<td>SC.2.N.1.1, SC.2.N.1.2, SC.2.N.1.3, SC.2.N.1.4, SC.2.N.1.5, SC.2.N.1.6</td>
</tr>
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</table>

Topics

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Introduction to Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note: Learning targets beginning with “review” indicate instruction from previous grades.</td>
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<tr>
<td>Recognize and explain that science is grounded in empirical observations that are testable; explanation must always be linked with evidence.</td>
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</tr>
<tr>
<td>Recognize and explain the difference between personal opinion/interpretation and verified observation.</td>
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<tr>
<td>Students will:</td>
<td></td>
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<tr>
<td>• set up a science notebook that will be used all year by students.</td>
<td></td>
</tr>
<tr>
<td>• explain that science is grounded on evidence-based observations that are testable.</td>
<td></td>
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<tr>
<td>• review the difference between verified observations (evidence) and inferences (explanations linked to evidence).</td>
<td></td>
</tr>
<tr>
<td>• explain the difference between verified observation (fact) and personal opinion/interpretation (bias).</td>
<td></td>
</tr>
<tr>
<td>o verified observation – an objective statement of which has been tested and supported by observable and/or measurable evidence/facts (data)</td>
<td></td>
</tr>
<tr>
<td>o personal opinion/interpretation – a subjective statement of a thought that may be based on logic and reason but is not necessarily based on testable evidence/facts</td>
<td></td>
</tr>
<tr>
<td>• distinguish between examples of empirical evidence (observations) and personal opinion/interpretation (a viewpoint based on one’s own judgment of the facts; a bias).</td>
<td></td>
</tr>
</tbody>
</table>

Average Weather Data Over Three Months

<table>
<thead>
<tr>
<th>Air Temp.</th>
<th>Rainfall</th>
</tr>
</thead>
<tbody>
<tr>
<td>March</td>
<td>20˚C</td>
</tr>
<tr>
<td>April</td>
<td>22˚C</td>
</tr>
<tr>
<td>May</td>
<td>23˚C</td>
</tr>
</tbody>
</table>

Teacher Hints for “Introduction to Science”:

- Students may prepare for the Solar System and Weather topic learning targets (beginning Week 5) by starting each morning with work routines which include collecting data on weather, seasons, star patterns, and moon phases. Students could take turns collecting different types of data during different times of the year.
- Begin planning investigations that incorporate Fair Game benchmarks within your instruction of 5th grade Nature of Science benchmarks such as incorporating SC.3.L.14.1 (plant structure and function) and SC.3.L.14.2 (plants responding to heat, light, and/or gravity) with SC.5.N.1.1.
- Empirical evidence (data) is a source of knowledge acquired by means of observation or experimentation.
- Students need to be able to distinguish between examples of verified observations, inferences, and personal opinions/interpretations using evidence/facts.

- verified observation – There was 1.5 cm more precipitation in April than in May.
- inference – The data shows that there is not a relationship between air temperature and rainfall.
- personal opinion/interpretation – March is the month to do outside activities; March had more dry days than any other month.

05 SMT 1 | Pre-Assessment | August 13 – 17
Weeks 2-4
Introduction to Science Process
This topic is continued on the next page.

Define a problem, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types such as: systematic observations, experiments requiring the identifications of variables, collecting and organizing data, interpreting data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.

Students will:
- generate testable questions that will generate observable and measurable data.
- formulate a testable hypothesis based on information gathered from research.
- design a scientific investigation individually or in teams through a variety of methods
- use scientific tools during investigations to observe and measure physical properties.
- explain that all conditions in an experiment outside the manipulated variable must be controlled or kept the same (ensure that the results of an experiment can be explained ONLY by the variable being tested and not by some other factor).
- evaluate another's written procedure or experimental setup.
- collect and record observable and measureable data in science notebooks.
- organize data in appropriate forms of record keeping (e.g., charts, tables, graphs).
- interpret and analyze data that has been collected.
- generate appropriate explanations based on evidence gathered (e.g., “My hypothesis was/was not supported by the evidence because…” or “The data gathered during my experiment did/did not support my hypothesis because…”).
- apply explanations to real world connections (application).

Recognize and explain that when scientific investigations are carried out, the evidence produced by those investigations should be replicable by others.

Recognize and explain the need for repeated experimental trials.

Students will:
- recognize that the results of experimental trials can vary even when common tools and procedures are used.
- discuss the reason for differences that may occur in data across groups as a result of using different tools and/or procedures.
- explain the need for repeated experimental trials or large experimental groups (to ensure the results are accurate, reliable, and valid).
- explain what is needed in order to repeat and replicate a scientific investigation (documented scientific procedures).
- recognize that when an experiment is replicated, it should produce similar results.
- distinguish the difference between repetition and replication.

SC.5.N.1.2
Also assesses SC.3.N.1.2/1.5 SC.4.N.1.2/1.5

SC.5.N.1.1
accurate communicate experimental design experimental groups experimental setup investigation mass/weight prediction record keeping reliable repeated observation repeated trials repetition/repeated replication/replicable results scientific method question/problem research hypothesis experiment materials procedure data/evidence results conclusion application scientific tools balance beaker eye dropper flask forceps goggles graduated cylinder hand lens hand lens microscope ruler scale spring scale stopwatch tape measure thermometer temperature time valid variable volume
<table>
<thead>
<tr>
<th>Weeks 2-4</th>
<th>Introduction to Science Process</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Identify a control group and explain its importance in an experiment.</td>
</tr>
<tr>
<td>Students will:</td>
<td>identify the control group in an experiment (considered to be the “normal condition” within the context of an experiment).</td>
</tr>
<tr>
<td>Students will:</td>
<td>explain the importance of a control group (to yield baseline data by which all other data will be compared).</td>
</tr>
<tr>
<td>Explain the difference between an experiment and other types of scientific investigation.</td>
<td>Recognize and explain that authentic scientific investigation frequently does not parallel the steps of “the scientific method”.</td>
</tr>
<tr>
<td>Students will:</td>
<td>explain that an authentic scientific investigation frequently does not parallel the steps of “the scientific method”.</td>
</tr>
<tr>
<td>Students will:</td>
<td>explain the difference between an experimental investigation and other types of scientific investigation.</td>
</tr>
<tr>
<td>Teacher Hints for “Introduction to Science Process”:</td>
<td>Digital textbook resources can be accessed through V-Portal. Visit the 5th Grade Science Canvas site for the Digital Program Access Information document.</td>
</tr>
<tr>
<td>Teacher Hints for “Introduction to Science Process”:</td>
<td>Students need to understand that scientists do not only learn from performing investigations but also from reading non-fiction references materials, such as journals, newspapers, reference books, etc. This research is beneficial before writing a hypothesis or creating any investigation.</td>
</tr>
<tr>
<td>Teacher Hints for “Introduction to Science Process”:</td>
<td>Investigations that follow the “scientific method” typically include a question/problem (or purpose), hypothesis, experiment (materials and procedures), results, conclusion (analysis of results), and application. Other investigations may include creating and using models, repeated observations, research, inquiry, problem/solution, and the engineering process.</td>
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<tr>
<td>Teacher Hints for “Introduction to Science Process”:</td>
<td>Some of the experimental investigations performed in the classroom should model 10 repeated trials (expectation for the elementary science fair/ expo process). It may be more appropriate, at times, to use a large experimental group (10 or more in a group) instead of repeated trials.</td>
</tr>
<tr>
<td>Teacher Hints for “Introduction to Science Process”:</td>
<td>When experimenting, students will need to understand the need to manipulate one variable, to control variables (keeping all other conditions constant) and to test a control group (the normal condition or means for comparison within the context of the experiment). For example, when trying to determine which type of soil supports the growth of marigolds, the following would need to be considered in the design of the experiment:</td>
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<tr>
<td>Teacher Hints for “Introduction to Science Process”:</td>
<td>The variable being manipulated would be different types of soil.</td>
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<tr>
<td>Teacher Hints for “Introduction to Science Process”:</td>
<td>The variables that need to be controlled would be soil amount, water amount, plant container, plant size, and sunlight exposure.</td>
</tr>
<tr>
<td>Teacher Hints for “Introduction to Science Process”:</td>
<td>The possible control group that would need to be tested is the soil that is most prevalent in the area where the marigolds will be planted.</td>
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<tr>
<td>Teacher Hints for “Introduction to Science Process”:</td>
<td>Repetition (multiple trials yielding stable and consistent data; reliability) differs from replication (experiment done by others to measure accuracy of data).</td>
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<td>Teacher Hints for “Introduction to Science Process”:</td>
<td>As scientists, students will be making observations and inferences in all types of investigations. Data that is collected through the five senses (observable/qualitative) and through the use of scientific and measurement tools (measurable/quantitative) become their observations. Students make inferences when they interpret or give their own meaning to the data they have collected.</td>
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<td>Teacher Hints for “Introduction to Science Process”:</td>
<td>Students should work on common investigations so that they are able to compare their results across groups. When differences arise, have students compare the different methods each group used to gather their data.</td>
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<tr>
<td>Teacher Hints for “Introduction to Science Process”:</td>
<td>While conducting investigations, students will use scientific tools. Metric measurements should be used when measuring these physical properties of matter:</td>
</tr>
<tr>
<td>Teacher Hints for “Introduction to Science Process”:</td>
<td>mass/weight in grams, kilograms – balance scale/pan balance, spring scale or digital scale</td>
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<tr>
<td>Teacher Hints for “Introduction to Science Process”:</td>
<td>volume in milliliters, liters – graduated cylinder (most accurate), beaker, flask, measuring cup</td>
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<td>Teacher Hints for “Introduction to Science Process”:</td>
<td>linear in centimeters, meters, kilometers – ruler, meter stick, meter tape</td>
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<tr>
<td>Teacher Hints for “Introduction to Science Process”:</td>
<td>time in seconds – stop watch</td>
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<tr>
<td>Teacher Hints for “Introduction to Science Process”:</td>
<td>heat energy in Fahrenheit and Celsius – thermometer</td>
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Due to changes in state testing schedules, the Elementary Science EXPO will occur on April 5, 2019!

Please be prepared to assign science fair projects much earlier this year.

Teacher Hints for "Introduction to Science Process":

- Digital textbook resources can be accessed through V-Portal. Visit the 5th Grade Science Canvas site for the Digital Program Access Information document.
- Students need to understand that scientists do not only learn from performing investigations but also from reading non-fiction references materials, such as journals, newspapers, reference books, etc. This research is beneficial before writing a hypothesis or creating any investigation.
- Investigations that follow the “scientific method” typically include a question/problem (or purpose), hypothesis, experiment (materials and procedures), results, conclusion (analysis of results), and application. Other investigations may include creating and using models, repeated observations, research, inquiry, problem/solution, and the engineering process.
- Some of the experimental investigations performed in the classroom should model 10 repeated trials (expectation for the elementary science fair/ expo process). It may be more appropriate, at times, to use a large experimental group (10 or more in a group) instead of repeated trials.
- When experimenting, students will need to understand the need to manipulate one variable, to control variables (keeping all other conditions constant) and to test a control group (the normal condition or means for comparison within the context of the experiment). For example, when trying to determine which type of soil supports the growth of marigolds, the following would need to be considered in the design of the experiment:
  - The variable being manipulated would be different types of soil.
  - The variables that need to be controlled would be soil amount, water amount, plant container, plant size, and sunlight exposure.
  - The possible control group that would need to be tested is the soil that is most prevalent in the area where the marigolds will be planted.
- Repetition (multiple trials yielding stable and consistent data; reliability) differs from replication (experiment done by others to measure accuracy of data).
- As scientists, students will be making observations and inferences in all types of investigations. Data that is collected through the five senses (observable/qualitative) and through the use of scientific and measurement tools (measurable/quantitative) become their observations. Students make inferences when they interpret or give their own meaning to the data they have collected.
- Students should work on common investigations so that they are able to compare their results across groups. When differences arise, have students compare the different methods each group used to gather their data.
- While conducting investigations, students will use scientific tools. Metric measurements should be used when measuring these physical properties of matter:
  - mass/weight in grams, kilograms – balance scale/pan balance, spring scale or digital scale
  - volume in milliliters, liters – graduated cylinder (most accurate), beaker, flask, measuring cup
  - linear in centimeters, meters, kilometers – ruler, meter stick, meter tape
  - time in seconds – stop watch
  - heat energy in Fahrenheit and Celsius – thermometer

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## Teacher Notes

All optional curriculum resources can be found on the 5th Grade Science Canvas Site
## NGSSS BODY OF KNOWLEDGE:

**Unit of Study:** Nature of Science/Earth and Space Science

**PACING:** Weeks 5 – 7 (14 days)

**Prerequisite Learning**
- Kindergarten – SC.K.E.5.5, SC.K.E.5.6
- First Grade – SC.1.E.5.1, SC.1.E.5.4
- Second Grade – none
- Third Grade – SC.3.E.5.1, SC.3.E.5.2, SC.3.E.5.3
- Fourth Grade – none

## Topics

### Learning Targets/Skills

**Topics**

<table>
<thead>
<tr>
<th>Week 5-6</th>
<th>Solar System</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Distinguish among the following objects of the Solar System – sun, planets, moons, asteroids, comets – and identify Earth’s position in it.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Recognize the major common characteristics of all planets and compare/contrast the properties of inner and outer planets.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Students will:</strong></td>
<td></td>
</tr>
<tr>
<td>• <strong>review</strong> that Earth rotates on its axis one time every 24 hours.</td>
<td></td>
</tr>
<tr>
<td>• <strong>review</strong> that Earth revolves (orbits) around the sun in one year.</td>
<td></td>
</tr>
<tr>
<td>• <strong>review</strong> how the appearance of the moon changes each night.</td>
<td></td>
</tr>
<tr>
<td>• <strong>review</strong> how patterns of stars (constellations) appear to shift across the sky nightly.</td>
<td></td>
</tr>
<tr>
<td>• <strong>review</strong> that different star patterns can be seen in different seasons.</td>
<td></td>
</tr>
<tr>
<td>• <strong>distinguish</strong> among the following objects in the Solar System: sun, planets, moons, asteroids, and comets.</td>
<td></td>
</tr>
<tr>
<td>• <strong>identify</strong> the position and sequential order of objects within the Solar System in relation to the sun using models (e.g., Earth, other planets, inner/outer planets, asteroid belt, stars, moons).</td>
<td></td>
</tr>
<tr>
<td>• <strong>identify</strong> major common characteristics of all planets (tilt on an axis, mass, gravity, revolving/orbiting around a star, rotation, presence of an atmosphere).</td>
<td></td>
</tr>
<tr>
<td>• <strong>compare</strong> the similarities among and differences between the characteristics of inner and outer planets (composition, size, atmospheres, relative temperature, moons, rings, relative length of year based on distance from the sun).</td>
<td></td>
</tr>
</tbody>
</table>

### Benchmarks

| SC.5.E.5.3 |
| SC.5.E.5.2 |

### Additional Language

- atmosphere
- asteroid belt
- asteroids
- axis
- comet
- composition
  - terrestrial/rocky/solid
  - gaseous
- Earth
- gravity
- mass
- moon
- orbit
- planets
  - inner
  - outer
- revolution/revolve
- rotation/rotate
- Solar System
- star
- star pattern/constellation
- sun
- tilt

### Teacher Hints for “Solar System”:

- Students will have to know the relationships that exist between planet distance from the sun and the effects of this distance. Therefore, if students are given two planets and asked which planet is hotter, they should recognize which planet is closer to the sun in order to make this comparison and draw conclusions.
- Sky Map is an app available on an Android (a free app at this time). It will show you where all of the constellations and planets are in the sky at your current location, day or night. It is a good way to explain that even though we cannot see the stars, they are still present.
- Distinguish between asteroids (large space rocks that orbit the sun) and comets (chunks of frozen gases, rock ice, and dust that orbit the sun).
- Students will not have to memorize quantitative data about each planet, they will not be assessed on the causes of seasons, and they will not have to identify star patterns in relation to specific seasons. However, they will need to know that the stars appear to shift because the Earth is rotating and revolving, not the stars.
- Have students observe and record data on the shape of the moon (what we can see) over a two month period. Students will **not** have to know the names of the moon phases, just recognize how the phases change over time (e.g., from new moon to 1st quarter moon to full moon to 3rd or last quarter moon, and back again to the new moon).
<table>
<thead>
<tr>
<th>Week 7</th>
<th>Galaxies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recognize that a galaxy consists of gas, dust, and many stars, including any objects orbiting the stars. Identify our home galaxy as the Milky Way.</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Students will:**
- review that the sun is a star that emits energy in the form of light and heat.
- review that stars are made of gases.
- review how stars can be different: brightness, size, temperature/color.
- review how a star’s appearance (brightness and size) is affected by its distance from Earth.
- describe the composition of a galaxy (gas, dust, and many stars, including any objects orbiting the stars).
- identify our home galaxy as the Milky Way.

| SC.5.E.5.1 | dust galaxy gas Milky Way |
| Embedded Nature of Science | SC.3.E.5.1/5.2/5.3 |
| SC.5.N.1.1 | SC.5.N.1.6 |
| SC.5.N.2.1 | |

**Teacher Hints for “Galaxies”:**
- Students will not need to know specific star names or star patterns/constellations, objects orbiting stars, or the chemical make-up of stars. Statewide Science Assessment may use names of stars or star patterns in the item stems but students will not need to memorize the names of stars or star patterns.
- The appearance of a star’s brightness is dependent upon its distance from Earth. A star that is closer to Earth will appear to be brighter than a star that is farther away.
- The appearance of a star’s size is dependent on its distance from Earth. A star that is closer to Earth appears to be larger than a star of similar size that is farther away.
- Students will not have to identify galaxies by name other than the Milky Way galaxy and will not need to know types of galaxies or identify galaxies by their type.

| 05 VST 1 (Part A) | Space Science | September 24 – 28 |
Teacher Notes

All optional curriculum resources can be found on the 5th Grade Science Canvas Site
## NGSSS BODY OF KNOWLEDGE:
### NATURE OF SCIENCE/EARTH AND SPACE SCIENCE

**Unit of Study:**
- **Weather & Climate**

**PACING:**
- Weeks 8 – 13 (29 days)
- October 1 – November 9

### Prerequisite Learning
- Kindergarten – none
- First Grade – none
- Third Grade – none
- Fourth Grade – none

### Topics

<table>
<thead>
<tr>
<th>Weeks 8-9</th>
<th>Water Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Learning Targets/Skills</strong></td>
<td>Create a model to explain the parts of the water cycle. Water can be a gas, a liquid, or a solid and can go back and forth from one state to another. Recognize that the ocean is an integral part of the water cycle and is connected to all of Earth’s water reservoirs via evaporation and precipitation processes.</td>
</tr>
<tr>
<td><strong>Benchmarks</strong></td>
<td>SC.5.E.7.1, SC.5.E.7.2</td>
</tr>
<tr>
<td><strong>Academic Language</strong></td>
<td>collection, condensation, evaporation, freshwater, heat gain/warming, heat loss/cooling, liquid water, precipitation, reservoir, resources, renewable, nonrenewable, runoff, saltwater, solid water/ice, states of matter, water cycle, water vapor/gas</td>
</tr>
</tbody>
</table>

### Teacher Hints for “Water Cycle”:
- Students will need to be exposed to various representations and/or stages of the water cycle (i.e. puddles, wet jeans hanging on a clothesline, water in a swimming pool, water in a fish tank, glass of ice tea, sealed plastic bag of water).
- In grade 3, students explored the physical changes of water. Review this foundational knowledge for the water cycle by defining and explaining vocabulary associated with matter changes: melting – changing from a solid (ice) to a liquid (water) due to a heat gain; evaporating – changing from a liquid (water) to a gas (vapor) due to a heat gain; condensing – changing from a gas (vapor) to a liquid (water) due to a heat loss; freezing – changing from a liquid (water) to a solid (ice) due to a heat loss.
- Condensation may take the forms of a cloud, fog, dew, frost, and/or humidity.
- This is an appropriate time to review renewable/nonrenewable resources that were taught in Grade 4 because water and the sun’s energy are renewable resources. Include a discussion of Florida’s renewable resources of sun, wind, and water as well as Florida’s non-renewable resources of phosphate, silica, limestone, and oil.
- SSA will not assess following terms: transpiration, infiltration, percolation, and reservoir. However, some terms, such as the term reservoir (collection), are not assessed on SSA but are good words to use instructionally. Earth’s bodies of water include, but are not limited to oceans, lakes, rivers, ponds, streams, and puddles.
Weeks 10-11
Weather
Teacher Hints for this topic are on the next page.

**Students will:**
- **review** measuring temperature using dual thermometers (Celsius and Fahrenheit).
- **describe** each of the components that determine the weather in a particular place and time (air temperature, air pressure, humidity, wind speed and direction, and precipitation).
- **match** weather data collection tools to the component of weather it measures (thermometer-air temperature, anemometer-wind speed, barometer-air pressure, wind vane-wind direction, rain gauge-precipitation, hygrometer-humidity).
- **collect and record** daily weather data using selected tools for the next two weeks.
- **describe** relationships that exist between components of weather:
  - As the air temperature increases, the humidity increases.
  - If the air pressure drops rapidly, the air temperature increases.
  - When the humidity increases, the chances for rain are greater.
  - As the air temperature approaches freezing, the chance of snow is greater.
- **identify and describe** how air temperature, air pressure, humidity, wind speed and direction, and precipitation determine the weather in a particular place.
- **Distinguish among the various forms of precipitation (rain, snow, sleet, and hail), making connections to the weather in a particular place and time.**
  - **cloud types** (cumulus, cirrus, stratus, and cumulonimbus) and their relationship to weather (e.g., cumulonimbus clouds are associated with stormy weather).
  - **explain** how different types of precipitation form (rain, snow, sleet, and hail).
  - **explain** the conditions necessary for different types of precipitation to form (e.g., hail develops during strong thunderstorms).
  - **discuss** relationships that exist amongst weather, location, and season (e.g., a strong thunderstorm may produce hail in Florida during spring and summer).

**Recognize how air temperature, barometric pressure, humidity, wind speed and direction, and precipitation determine the weather in a particular place and time.**

**Students will:**
- **describe** each of the components that determine the weather in a particular place and time (air temperature, air pressure, humidity, wind speed and direction, and precipitation).

**Recognize that some of the weather-related differences, such as temperature and humidity, are found among different environments, such as swamps, deserts, and mountains.**

**Students will:**
- **compare** the weather conditions of different environments: desert, grassland, rainforest, tundra, wetland, swamps, and mountains (e.g., the weather over a desert is more likely to be dry and hot, and the weather over a swamp is more likely to be warm and rainy).
**Teacher Hints for “Weather”:**
- You may want to have students track the weather elements (air temperature, air pressure, humidity, cloud cover, etc.) on a class chart and in their student notebook.
- In scenarios, wind speeds will be shown in miles per hour (mph).
- Students will need to know how clouds are related to weather and that cumulus, cirrus, stratus, and cumulonimbus clouds are all associated with certain kinds of weather conditions. Students should be aware that clouds have names but they will not have to differentiate among the different types of clouds.
- Distinguish between how sleet and hail form:
  - sleet - precipitation that freezes near the ground that often begins as rain or snow
  - hail - precipitation that is chunks/balls of ice that usually falls during a thunderstorm
- Assessment items will use the term air pressure rather than barometric pressure.
- This is a good time to review weathering and erosion, a concept that is only taught in Grade 4. Weathering may occur as a result of precipitation falling onto Earth’s surface and as it flows, chips and breaks rock. Erosion may occur as water is flowing over Earth’s surface, moving bits of rock from one place to another.

**Weeks 12-13**

**Climate**

<table>
<thead>
<tr>
<th>Describe characteristics (temperature and precipitation) of different climate zones as they relate to latitude, elevation, and proximity to bodies of water.</th>
<th>SC.5.E.7.6 Embedded Nature of Science SC.5.N.1.1 SC.5.N.2.1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Students will:</strong></td>
<td>climate climate zone elevation environment equator latitude polar temperate tropical</td>
</tr>
<tr>
<td>identify the location of major climate zones (polar, tropical, and temperate) on a globe and on different maps.</td>
<td></td>
</tr>
<tr>
<td>locate the equator (0 degrees latitude) and Florida on a globe and on different maps.</td>
<td></td>
</tr>
<tr>
<td>distinguish between environments and climate zones (e.g. the tundra environment is located within the polar zone, the rainforest environment is within the tropical zone).</td>
<td></td>
</tr>
<tr>
<td>describe air temperature and precipitation of different climate zones.</td>
<td></td>
</tr>
<tr>
<td>describe how air temperature and precipitation relate to latitude (distance from equator) within a climate zone.</td>
<td></td>
</tr>
<tr>
<td>describe how air temperature and precipitation relate to elevation (e.g., mountains and valleys) within a climate zone.</td>
<td></td>
</tr>
<tr>
<td>describe how air temperature and precipitation relate to the proximity to bodies of water (e.g., coastal vs. inland, ocean currents) within a climate zone.</td>
<td></td>
</tr>
</tbody>
</table>

**Teacher Hints for “Climate”:**
- Students should have practice locating the equator and tropical, temperate, and polar zones on different maps. Students should be able to identify the different environments located within each zone. At the elementary level, students need to recognize Florida as being in the temperate zone.
- Students should have exposure to topographic maps in order to feel how elevation is represented on a map.
- Students will not require specific knowledge of geographic locations and will not need to know about cold and warm fronts.

**Enrichment**

Design a family preparedness plan for natural disasters and identify the reasons for having such a plan.

<table>
<thead>
<tr>
<th>SC.5.E.7.7 natural disasters preparedness</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Students will:</strong></td>
</tr>
<tr>
<td>recognize that Florida’s temperate climate, proximity to the ocean, and geography make it vulnerable to a number of potential natural disaster threats (e.g., hurricanes, tropical storms, tornadoes, wildfires, flooding).</td>
</tr>
<tr>
<td>design a family preparedness plan for natural disasters.</td>
</tr>
<tr>
<td>identify the reasons for having family preparedness plans.</td>
</tr>
</tbody>
</table>

**Teacher Hints for “Enrichment (Family Preparedness Plan)”:**
- Some resources that could be used as a home-school connection activity are provided below.
  - Creating a severe weather plan.  [http://www.floridadisaster.org/family/](http://www.floridadisaster.org/family/)
  - Be prepared with [https://www.ready.gov/kids](https://www.ready.gov/kids)
### Teacher Notes

All optional curriculum resources can be found on the 5th Grade Science Canvas Site
### NGSSS BODY OF KNOWLEDGE: NATURE OF SCIENCE/PHYSICAL SCIENCE

**Unit of Study:** Matter

**PACING:** Weeks 14 – 18 (21 days)

November 13 – December 19

### Prerequisite Learning
- Kindergarten – SC.K.P.8.1, SC.K.P.9.1
- First Grade – SC.1.P.8.1, SC.1.E.5.3

### Topics

<table>
<thead>
<tr>
<th>Learning Targets/Skills</th>
<th>Benchmarks</th>
<th>Academic Language</th>
</tr>
</thead>
</table>

### Weeks 14-15

#### Properties of Matter

**Learning Targets/Skills**

- **Students will:**
  - **review** by describing and classifying a material as a solid, liquid, or gas.
  - **review** how to use the water displacement method to find the volume of regular- and irregular-shaped solids.
  - **justify** the reasoning for the classification of materials based on shape, mass (weight) and volume (water displacement).
  - **recognize** that physical properties include both observable and measurable properties.
  - **compare and contrast** the observable properties of solids, liquids, and gases (e.g., shape, color, hardness, texture, attraction to magnets).
  - **compare and contrast** the measurable properties of solids, liquids, and gases (e.g., mass, volume, temperature).

**Topics**

<table>
<thead>
<tr>
<th>Learning Targets/Skills</th>
<th>Benchmarks</th>
<th>Academic Language</th>
</tr>
</thead>
</table>

### Teacher Hints for "Properties of Matter":

- A solid has a definite shape but a collection of solids may take the shape of the container that holds them and will also pour, a property we often associate with liquids (sand, rice, sugar, salt).
- Check for student understanding of measurable physical properties: time (min. and sec.), linear (cm, m, km), mass (mg, g, kg), volume (mL, L), and temperature (°C, °F). Use the listing of scientific tools to identify the physical properties of matter. Students need exposure to dual thermometers, which show °C and °F on the same thermometer. They will not convert temperature from Celsius to Fahrenheit and vice versa.
- The water displacement method is a technique used to measure the volume of an object by calculating how much water it displaces, or pushes aside when placed into a sample of water. To determine the volume of an object, subtract the final water level from the starting water level.

### Weeks 16-17

#### Changes in Matter

**Learning Targets/Skills**

- **Investigate and describe** that many physical and chemical changes are affected by temperature.

**Students will:**

- **review** the causes for the weathering of rocks (ice wedging, precipitation and flowing water, abrasion of particles carried by the wind, plant roots, temperature change).
- **review** the causes for the erosion of rocks (gravity, ice/glaciers, flowing water, wind).
- **review** by describing visible signs of a chemical change that may occur (odor, color change, temperature change, gas production/fizzing sound).
- **review** by comparing the similarities and differences of physical and chemical changes.
- **investigate and describe** that many physical changes to solids and liquids are affected by temperature change (e.g., melting, freezing, evaporating, condensing, dissolving).
- **investigate and describe** how temperature can cause a chemical change that results in the formation of a new material with different characteristics (e.g., baking, grilling, frying, toasting, decaying plant and animal matter, rusting, releasing of carbon dioxide).

**Topics**

<table>
<thead>
<tr>
<th>Learning Targets/Skills</th>
<th>Benchmarks</th>
<th>Academic Language</th>
</tr>
</thead>
</table>

### Teacher Hints for this topic are on the next page.
### Teacher Hints for “Changes in Matter”:
- Check out Changing States [here](http://www.bbc.co.uk/schools/scienceclips/ages/9_10/changing_state.shtml) for support of ways objects undergo change.
- Evidence of a chemical change may include a color change, a gas or solid formation, new odor presence, temperature change, and different characteristics in the material.
- Please note that evidence of a color change does not always indicate that a chemical change has occurred. For example, the addition of food coloring to water changes the water color but is only a physical change. A new substance does not form.

### Week 18
#### Mixtures

**Demonstrate and explain** that mixtures of solids can be separated based on observable properties of their parts such as particle size, shape, color, and magnetic attraction.

**Investigate and identify** materials that will dissolve in water and those that will not and identify the conditions that will speed up or slow down the dissolving process.

**Students will:**
- **demonstrate and explain** how mixtures of solids can be separated based on observable properties of their parts (e.g., particle size, shape, color, magnetic attraction) through sorting, screening-sieve, filtration, magnets, and evaporation.
- **investigate** common household materials (liquids or solids) that will dissolve in water (e.g., salt, sugar, drink mixes) and those that will not (e.g., rice, beans, cooking oil, lard).
- **recognize** that not all parts of a mixture will dissolve.
- **investigate** the conditions (temperature, stirring/shaking, surface area) that will speed up or slow down the dissolving process and/or chemical reactions (e.g., heat speeds up reactions and the dissolving process).

<table>
<thead>
<tr>
<th>SC.5.P.8.3</th>
<th>SC.5.P.8.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissolve filter/filtration</td>
<td>Magnetic attraction</td>
</tr>
<tr>
<td>Mixture</td>
<td>Particular size</td>
</tr>
<tr>
<td>Sieve</td>
<td>Retain properties</td>
</tr>
<tr>
<td>Sort</td>
<td>Surface area</td>
</tr>
</tbody>
</table>

### Teacher Hints for “Mixtures”:
- Be sure to include materials that are magnetic in mixtures that are being separated (e.g., iron filings, aluminum, paper clips, staples, screws, nails).
- Providing experiences with dissolving solids in liquids (e.g., salt and water, sand and water) and liquids in liquids (e.g., oil and water, food coloring and water).
- Ask students to record physical properties of 3-4 substances before combining to make a mixture. Discuss whether each substance retains its physical properties or not.
- Provide students an experience to separate a mixture that includes solids and liquids that do and don’t dissolve (e.g., water, salt, sand, iron filings, and gravel).
- Warmer temperatures, vigorous stirring/shaking, and a greater amount of surface area exposed will speed up the rate at which a substance will both dissolve and react (e.g., Alka-Seltzer will dissolve faster when placed in warm water, stirred, and/or broken/crushed into smaller pieces).
- Liquids that will not dissolve in water include, but are not limited to, cooking oil, mineral oil, baby oil.
- Solids that will not dissolve in water include, but are not limited to, sand, pepper, flour, corn starch, baby powder, marbles.
- The term **solutions** is no longer assessed. Refer to these special mixtures as **mixtures that dissolve**. Students will not have to differentiate between a mixture and a solution.

### Enrichment

**Explore the scientific theory of atoms** (also called atomic theory) by recognizing that all matter is composed of parts that are too small to be seen without.

**Students will:**
- **define** atoms as the building blocks of matter.
- **recognize** that all matter is composed of parts that are too small to be seen with ordinary microscopes.

| SC.5.P.8.4 | atoms |

### Teacher Hints for “Enrichment”:
- Students will not be assessed on Enrichment benchmarks. In regards to this content, students will no longer be assessed on atoms or the atomic theory. Teachers may instruct this content post-SSA and in preparation for middle school.
<table>
<thead>
<tr>
<th>Teacher Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>All optional curriculum resources can be found on the 5th Grade Science Canvas Site</td>
</tr>
</tbody>
</table>
NGSSS BODY OF KNOWLEDGE: NATURE OF SCIENCE/PHYSICAL SCIENCE
Unit of Study: Energy & Motion

PACING: Weeks 19 – 24 (29 days)
January 7 – February 15

Prerequisite Learning
Kindergarten – SC.K.P.10.1, SC.K.P.12.1, SC.K.P.13.1, SC.K.E.5.1
First Grade – SC.1.P.12.1, SC.1.P.13.1, SC.1.E.5.2

<table>
<thead>
<tr>
<th>Topics</th>
<th>Learning Targets/Skills</th>
<th>Benchmarks</th>
<th>Academic Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>Investigate and describe some basic forms of energy, including light, heat, sound, electrical, chemical, and mechanical.</td>
<td>SC.5.P.10.1</td>
<td>absorb</td>
</tr>
<tr>
<td></td>
<td>Students will:</td>
<td></td>
<td>bend</td>
</tr>
<tr>
<td></td>
<td>• investigate and describe some basic forms of energy, including light, heat (thermal), sound, electrical, chemical, and mechanical (energy of motion).</td>
<td></td>
<td>change</td>
</tr>
<tr>
<td></td>
<td>o review how light travels in a straight line until it strikes an object (opaque, translucent, transparent) and then is reflected/bounced, bent, or absorbed.</td>
<td></td>
<td>conduct/conductor</td>
</tr>
<tr>
<td></td>
<td>o review that things that give off light often also give off heat.</td>
<td></td>
<td>energy</td>
</tr>
<tr>
<td></td>
<td>o review that heat is produced when one object rubs against another (friction).</td>
<td>o chemical</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o review that sound is produced by vibrations and that pitch depends on how fast or slow an object vibrates.</td>
<td>o electrical</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o review that heat flows from a hot object to a cold object.</td>
<td>o heat (thermal)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o review common materials that conduct heat well or poorly.</td>
<td>o light</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o review that mechanical energy is stored at a position or released in motion.</td>
<td>o mechanical</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o explain that electrical energy is the flow of a charge/current through a material.</td>
<td>o sound</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o explain that chemical energy is stored or released in a chemical reaction (e.g., a source is from the foods animals eat).</td>
<td>o friction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Investigate and explain that energy has the ability to cause motion or create change.</td>
<td>SC.5.P.10.2</td>
<td>heat flow</td>
</tr>
<tr>
<td></td>
<td>Students will:</td>
<td></td>
<td>heat gain</td>
</tr>
<tr>
<td></td>
<td>• identify and describe examples where energy has caused motion and/or created change (e.g., twirling pinwheel, boiling water, cooking food, turning on a lamp, freezing water, melting chocolate, plant/animal decay, vibration of a radio speaker).</td>
<td></td>
<td>heat loss</td>
</tr>
<tr>
<td></td>
<td>• explain the relationship between energy, motion, and change.</td>
<td></td>
<td>insulator</td>
</tr>
</tbody>
</table>

Teacher Hints for “Energy”:
• Energy has the ability to cause motion or create change.
• Plants use energy from the sun to make their own food. Animals consume plants as food for their energy. Food (from plants and animals) is then transformed to chemical energy in the animal's body so that it may be used. For example, humans consume food and convert this source into chemical energy.
• The terms kinetic and potential energy are no longer taught in elementary. Mechanical energy is the energy of position and motion.
• In a complete circuit, there is a power source in which the energy will flows from and back to this source.
• A foldable, such as multi-page flipbook, may be a way for students to organize the information of all the different types of energy taught in grades 3, 4, and 5.
• Review renewable and nonrenewable energy resources, focusing on resources found in Florida: sun, air/wind, water, phosphate, oil, limestone, silica (sand).
• Present a scenario and ask for evidence of change due to some kind of energy being applied (e.g., pushing someone down a slide, a stick moving along with a current).
• An object that is put into motion will always change its original position and sometimes its direction.
**Weeks 21-22**

**Electricity**

**Investigate and explain that electrical energy can be transformed into heat, light, and sound energy, as well as the energy of motion.**

**Investigate and explain that an electrically-charged object can attract an uncharged object and can either attract or repel another charged object without any contact between the objects.**

**Students will:**
- **investigate and explain** that electrical energy can be transformed into heat, light, sound, and mechanical energy (e.g., lamp, heater, generator, motor, stove, mobile device).
- **investigate** static electricity (a buildup of electrical charges on an object).
- **explain** that opposite electrical charges attract (pull towards each other) and like electrical charges repel (push apart) without any contact needed between the objects.
- **explain** that an electrically-charged object, whether positively or negatively charged, will attract an uncharged (neutral) object.

**SC.5.P.10.4**
**Embedded Nature of Science**
SC.5.N.1.1
SC.5.N.1.4
SC.5.N.1.5
SC.5.N.2.1
SC.5.N.2.2

**attract**
**electric charge**
- negative
- positive
- neutral

**repel**
**static electricity**
**transformation**

**Investigate and illustrate the fact that the flow of electricity requires a closed circuit (a complete loop).**

**Students will:**
- **determine** the source of energy for a circuit.
- **investigate and illustrate** the fact that the flow of electricity requires a closed circuit (a complete loop) when constructing a simple circuit.
- **distinguish** between open and closed circuits.
- **determine** which circuit from a visual representation can carry electricity to power an object and which circuit cannot.
- **demonstrate** that a switch can open and close a circuit.

**SC.5.P.11.1**
**Embedded Nature of Science**
SC.5.N.1.1
SC.5.N.1.4
SC.5.N.1.5
SC.5.N.2.1
SC.5.N.2.2

**closed circuit**
**conductors**
**electricity**
**insulator**
(poor conductor)
**open circuit**
**simple circuit**
**switches**

**Identify and classify materials that conduct electricity and materials that do not.**

**Students will:**
- **identify and classify** materials that are good conductors (e.g., copper, water, aluminum foil) and insulators/poor conductors (e.g., plastic, rubber, glass, wood) of electricity.

**SC.5.P.11.2**
**Embedded Nature of Science**
SC.5.N.1.1
SC.5.N.1.4
SC.5.N.2.1
SC.5.N.2.2

**Teacher Hints for “Electricity”:**
- Electricity learning targets are specific to grade 5. Students should be given hands-on, minds-on experiences in both static and current electricity.
- Make learning connections between the similarities of magnetism and static electricity. Neither requires contact for motion or a change in position to occur. Both involve the property of attraction and repulsion. Students just need a conceptual understanding of static electricity, not how matter gains or loses electrons. For example, a conceptual understanding includes knowing the direction of movement caused by a negatively charged balloon being placed near a positively charged balloon.
- Students should build complete electrical circuits and then investigate open and closed circuits.
- Electrical energy flows from the energy source, such as a battery, to the light source, and then returns to the energy source before flowing to the light source again.
- Students should investigate making a circuit with one wire, one bulb, and one battery.
- Students learn that electrical energy may transform to light, sound, and/or mechanical energy through experiences with static and current electricity.

**05 SMT 2**

**Progress Monitoring**

**January 14 – 18**
**Weeks 23-24**

**Force and Motion**

**Identify familiar forces that cause objects to move, such as pushes or pulls, including gravity acting on falling objects.**

**Students will:**
- review that gravity is a force that can be overcome.
- review examples of magnetic attraction and repulsion.
- identify familiar forces (pushes, pulls, friction, gravity, magnetism) that cause or hinder movement of objects.
- identify two or more forces acting upon an object in a scenario.
- interpret the effect of two or more forces acting upon an object.
- recognize that friction is a force that resists movement.

**Investigate and describe that the greater the force applied to it, the greater the change in motion of a given object.**

**Investigate and explain that when a force is applied to an object but it does not move, it is because another opposing force is being applied by something in the environment so that the forces are balanced.**

**Students will:**
- measure force in Newtons (N) using a spring scale.
- demonstrate that a force may change an object’s original position.
- investigate that the greater the force applied to an object, the greater the change in motion of a given object.
  - the amount of force applied to an object affects the speed and/or distance at which it moves
  - force affects the direction an object moves
- investigate and explain the effect balanced and unbalanced forces have on motion.
  - balanced forces are present when an object does not move because opposing forces are holding the object in place (e.g., a book laying on a table is being acted upon by the table pushing up on the book from below and gravity pushing down from above).
  - unbalanced forces are present when an object does move because one of the opposing forces moves the object from its original position.

**Investigate and describe that the more mass an object has, the less effect a given force will have on the object’s motion.**

**Students will:**
- investigate and describe the relationship among mass, force, and motion.
  - objects with greater mass require more force to move compared with objects of less mass (and the reverse).
  - more force is required to slow down an object in motion with greater mass compared to an object with less mass (and the reverse).

---

**Teacher Hints for “Force and Motion”:**
- A force may cause motion and/or a rotation. When an object has moved, it has changed its original position.
- When a force is applied to an object but it does not move, it is because another opposing force is being applied by something in the environment. These forces are balanced. A game of tug-of-war illustrates the idea of balanced and unbalanced forces.
- Magnets were introduced in grades 2 and 4. Students may need some review in grade 5 predicting the causes and effects of magnet movements.
- Students will not need to know specific Newton Laws, but they will need to have a conceptual understanding of force and motion addressed within these laws.
- A spring scale measures the force of gravity on an object (its weight). The spring inside stretches according to the object’s weight hanging on the hook of the spring scale.

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**STEM Week – Week 25 (See the Grade 5 Canvas site for STEM lesson)**

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<thead>
<tr>
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<th>Physical Science</th>
<th>February 19 – 22</th>
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**Volusia County Schools**
Elementary Science Department

**Grade 5 Science Curriculum Map**
July 2018

24
Teacher Notes

All optional curriculum resources can be found on the 5th Grade Science Canvas Site
## NGSSS BODY OF KNOWLEDGE: NATURE OF SCIENCE/LIFE SCIENCE

**Unit of Study:** Life  
**PACING:** Weeks 26 – 29 (19 days)  
February 25 – March 29

### Prerequisite Learning
- First Grade – SC.K.L.14.3, SC.1.L.16.1
- Second Grade – SC.2.L.14.1, SC.2.L.17.1, SC.2.L.17.2
- Third Grade – SC.3.L.15.1, SC.3.L.15.2, SC.3.L.17.1

### Topics

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<th>Topics</th>
<th>Learning Targets/Skills</th>
<th>Benchmarks</th>
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</thead>
</table>
| **Human Body Organs and Functions** | Identify the organs in the human body and describe their functions, including the skin, brain, heart, lungs, stomach, liver, intestines, pancreas, muscles and skeleton, reproductive organs, kidneys, bladder, and sensory organs.  
**Students will:**  
- **identify** the organs in the human body: brain, heart, lungs, stomach, liver, small intestine, large intestine, pancreas, muscles, skeleton, kidneys, bladder, and reproductive organs (ovaries, testes), sensory organs (eyes, ears, nose, tongue, and skin).  
- **describe** the function(s) of the body parts mentioned above  
  - stomach breaks down food into nutrients that the body uses  
  - pancreas produces digestive enzymes that control sugar and aid in digestion  
  - liver cleans blood by removing toxins and breaks down fats for digestion  
  - brain controls the body’s organs  
  - heart pumps the blood throughout the body  
  - lungs oxygenate the blood through respiration (taking in and releasing air)  
  - small intestines absorb nutrients from food  
  - large intestines absorb water and move waste out of the body  
  - muscles help the body move  
  - skeleton provides structural support and protects vital organs  
  - reproductive organs allow reproduction to occur, may make new organisms  
  - kidneys filter waste from blood  
  - bladder stores liquid waste (urine)  
  - sensory organs are responsible for letting humans see, hear, smell, taste, and touch | SC.5.L.14.1 | human body organs  
- brain  
- heart  
- lungs  
- stomach  
- liver  
- small intestine  
- large intestine  
- pancreas  
- muscles  
- skeleton (internal)  
- kidneys  
- bladder  
- reproductive organs  
  - ovaries  
  - testes  
- sensory organs  
  - eyes  
  - ears  
  - nose  
  - tongue  
  - skin |

**Teacher Hints for “Human Body Organs and Functions”:**  
- Diagrams of the reproductive organs will not be used on the SSA or the district assessment. Teachers are instructed to refrain from using the rubber band books in the AIMS Life Book entitled, the Male Reproductive System and the Female Reproductive System.  
- Students will NOT need to match body structures with the body system to which it belongs, but they will need to identify the structure and their function(s) for the following individual organs: brain, lungs, stomach, liver, large intestine, small intestine, pancreas, muscle, skeleton, testes, ovaries, kidneys, bladder, and sensory organs.  
- Students do NOT need to know the names of the bones or muscles but will need to know the function(s) of the skeleton and muscles.  
- Items will not require specific knowledge of the parts of organs although instruction of these parts may lead to a more complete understanding of each organ.  
- Making Life Easier lessons will assist in reviewing life science content from 3rd and 4th grade.
### Week 27

**Structure/Function Comparison**

**Students will:**
- **review** plant structures and their functions.
  - flower/fruit – reproduction
  - seed/spore - reproduction
  - leaf/needle – food production
  - stem – supports the plant, transports water and nutrients
  - root – supports the plant, absorbs water and nutrients
- **review** animal classification and attributes for each group.
  - vertebrates – mammals, birds, reptiles, amphibians, and fish
  - invertebrates – include arthropods (segmented bodies, jointed legs, hard outer covering/exoskeleton)
- **differentiate** the function(s) of organs in animals (e.g., exoskeleton vs. internal skeleton, lungs vs. gills, nose vs. antenna, skin vs. scales).
- **compare** structure/function of plants and animals that serve similar roles limited to the following: skin to plant covering, skeleton to stem, reproductive organs to a flower (pistil, ovary, eggs, pollen/sperm, stamen).

**Teacher Hints for “Structure/Function Comparison”**:
- Make a comparison between animal and plant sexual reproduction structure/function:
  - plant female structures of pistil, ovary, eggs with human structures of ovary and eggs
  - plant male structures of pollen/sperm, stamen with human structures of testes and sperm
- *Florida Achieves FOCUS Org/Dev of Living Organisms SC.5.L.14.2: First and Second Assessments* will guide you in how structure/function comparison content may translate to assessment item stems.
- *Making Life Easier lessons will assist in reviewing life science content from 3rd and 4th grade.*
- Reviewing plant and animal structure/function, plant behaviors, animal classification, and food chains will assist students with the benchmark targets in this unit. ScienceSaurus pages 76-97, 107, 126-131, and 133-155 may serve as a reference.
### Week 28

#### Adaptations

**Compare and contrast adaptations displayed by animals and plants that enable them to survive in different environments such as life cycles variations, animal behaviors and physical characteristics.**

Describe how, when the environment changes, differences between individuals allow some plants and animals to survive and reproduce while others die or move to new locations.

**Students will:**

- **review** food chains (e.g., sun → grass → rabbit → fox).
- **review** the classification of consumers as herbivores, carnivores, or omnivores.
- **distinguish** between physical and behavioral adaptations displayed by animals and plants.
- **explain** how adaptations displayed by plants and animals enable them to survive in different environments.
  - physical characteristics (e.g., body/stem covering, body fat, leaf shape, body shape, teeth, claws, acute eyesight/hearing).
  - behaviors (e.g., dormancy, root growth, color change, climb, hide).
  - life cycles variations (e.g., complete and incomplete metamorphosis, seasonal dormancy, a seed’s germination following extreme environmental conditions).
- **identify** ways an environment changes (e.g., disease, fire, drought, pollution, human intervention, climate, increased predators, increased competition for food).
- **describe** structures and behaviors that plants and animals use in a changing environment.
- **explain** that physical and behavioral adaptations of plants and animals are used in changing environments to enable some plants and animals to survive and reproduce while others die or move to new locations.

**Teacher Hints for “Adaptations”:**

- Physical adaptations are those structures/features physically on plants and animals that allow them to survive and reproduce within their environment. Examples of these adaptations include waxy coating on cacti that allow them to retain water and wide feet on some desert animals that prevent them from sinking into the sand.
- Behavioral adaptations are those behaviors exhibited by plants and animals that allow them to survive and reproduce within their environment. Examples of these adaptations include plants growing their roots deeper into the soil in search of water during drought conditions and lizards purposefully breaking off their tails in order to escape their predators.
- Living things go through stages of growth and development called a life cycle. Students have learned in previous grade levels about life cycles. Review animal and plant life cycles, including the two insect life cycles of complete and incomplete metamorphosis.
- **Florida Achieves FOCUS Interdependence:** SC.5.L.17.1 First and Second Assessments will guide you in how content on adaptations may translate to assessment item stems.
- **Making Life Easier** lessons will assist in reviewing life science content from 3rd and 4th grade.

<table>
<thead>
<tr>
<th>SC.5.L.17.1</th>
<th>SC.5.L.15.1</th>
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</thead>
<tbody>
<tr>
<td>adaptation</td>
<td>camouflaged</td>
</tr>
<tr>
<td>physical</td>
<td>carnivore</td>
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<tr>
<td>behavioral</td>
<td>competition</td>
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<tr>
<td>camouflage</td>
<td>consumer</td>
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<tr>
<td>environment</td>
<td>food chain</td>
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<tr>
<td>herbivore</td>
<td>hibernation</td>
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<tr>
<td>migration</td>
<td>omnivore</td>
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<tr>
<td>population</td>
<td>predator</td>
</tr>
<tr>
<td>prey</td>
<td>producer</td>
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<tr>
<td>resources</td>
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</tr>
</tbody>
</table>

**05 VST 3**

**Life Science**

**March 11 – 14**
## Teacher Notes

All optional curriculum resources can be found on the 5th Grade Science Canvas Site
**NGSSS BODY OF KNOWLEDGE:** NATURE OF SCIENCE  
**Unit of Study:** Practice of Science  
**PACING:** Weeks 29 – 38  
March 25 – May 31

| Prerequisite Learning | Kindergarten – SC.K.N.1.1, SC.K.N.1.2, SC.K.N.1.3, SC.K.N.1.4, SC.K.N.1.5  
First Grade – SC.1.N.1.1, SC.1.N.1.2, SC.1.N.1.3, SC.1.N.1.4, SC.1.E.5.3  
Second Grade – SC.2.N.1.1, SC.2.N.1.2, SC.2.N.1.3, SC.2.N.1.4, SC.2.N.1.5, SC.2.N.1.6  

<table>
<thead>
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<th>Topics</th>
<th>Learning Targets/Skills</th>
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<th>Academic Language</th>
</tr>
</thead>
</table>
| **Week 29** | Return to the Grade 5 Science Canvas Site for suggestions that were not used during the Introduction of Science at the start of the school year.  
Return to the Grade 5 Science Canvas Site for suggestions that were not used during the Introduction of Science at the start of the school year.  
Recognize and explain that science is grounded in empirical observations that are testable; explanation must always be linked with evidence.  
Recognize and explain the difference between personal opinion/interpretation and verified observation.  
**Students will:**  
• explain that science is grounded on evidence-based observations that are testable.  
• review the difference between verified observations (evidence) and inferences (explanations linked to evidence).  
• explain the difference between verified observation (fact) and personal opinion/interpretation (bias).  
  o verified observation – an objective statement of which has been tested and supported by observable and/or measurable evidence/facts (data)  
  o personal opinion/interpretation – a subjective statement of a thought that may be based on logic and reason but is not necessarily based on testable evidence/facts.  
• distinguish between examples of empirical evidence (observations) and personal opinion/interpretation (a viewpoint based on one’s own judgment of the facts; a bias).  
| SC.5.N.2.1  
SC.5.N.1.6  
Also assesses SC.3.N.1.7  
SC.4.N.1.7 |
| **Weeks 30** | Define a problem, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types such as: systematic observations, experiments requiring the identifications of variables, collecting and organizing data, interpreting data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.  
**Students will:**  
• generate testable questions that will generate observable and measurable data.  
• formulate a testable hypothesis based on information gathered from research.  
• design a scientific investigation individually or in teams through a variety of methods  
• use scientific tools during investigations to observe and measure physical properties.  
• explain that all conditions in an experiment outside the manipulated variable must be controlled or kept the same (ensure that the results of an experiment can be explained ONLY by the variable being tested and not by some other factor).  
• evaluate another’s written procedure or experimental setup.  
• collect and record observable and measurable data in science notebooks.  
• organize data in appropriate forms of record keeping (e.g., charts, tables, graphs).  
• interpret and analyze data that has been collected.  
| SC.5.N.1.1  
Also assesses SC.3.N.1.1  
SC.4.N.1.1/1.6 |

Volusia County Schools  
Elementary Science Department  
Grade 5 Science Curriculum Map  
July 2018
- **generate** appropriate explanations based on evidence gathered (e.g., "My hypothesis was/was not supported by the evidence because…”).
- **apply** explanations to real world connections (application).

<table>
<thead>
<tr>
<th>Weeks 30</th>
<th>Science Process</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Identify a control group and explain its importance in an experiment.</strong></td>
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<tr>
<td><strong>Students will:</strong></td>
<td></td>
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<tr>
<td>- <strong>identify</strong> the control group in an experiment (a test group where the variable is NOT applied; considered to be the “normal condition” within the context of an experiment).</td>
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<tr>
<td>- <strong>explain</strong> the importance of a control group (to yield baseline data by which all other data will be compared).</td>
<td></td>
</tr>
</tbody>
</table>

| SC.5.N.1.4 | control group experiment experimental group |
| SC.5.N.2.2 | exploration research scientific method systematic observations types of scientific investigations ○ comparative ○ descriptive ○ experimental |
| SC.5.N.1.3 | Also assesses SC.4.N.1.3 |
| SC.5.N.1.5 | accurate experimental groups reliable repeated observation repeated trials replication/replicable results valid |
| SC.5.N.1.6 | Also assesses SC.3.N.1.2/1.5 SC.4.N.1.2/1.5 |

**Weeks 31-34**

"Fair Game” Assist and “Finishing Touches” for SSA
Utilize progress monitoring data and information on pgs. 6-7 to identify “fair game” content review necessary for final SSA preparation.

**Week 35**

Administration of STATEWIDE SCIENCE ASSESSMENT

**Weeks 36-38**

Nature of Science and STEM Weeks

<table>
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<tr>
<th>05 VST 4</th>
<th>Nature of Science</th>
<th>May 20 – 31</th>
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Volusia County Schools
Elementary Science Department

Grade 5 Science Curriculum Map
July 2018
Science Process Skills: Basic and Integrated

Observing: using your senses to gather information about an object or event; a description of what is actually perceived; information that is considered to be qualitative data

Measuring: using standard measures or estimations to describe specific dimensions of an object or event; information considered to be quantitative data

Inferring: formulating assumptions or possible explanations based upon observations

Classifying: grouping or ordering objects or events into categories based upon characteristics or defined criteria

Predicting: guessing the most likely outcome of a future event based upon a pattern of evidence

Communicating: using words, symbols, or graphics to describe an object, action, or event

Formulating Hypotheses: stating the proposed solutions or expected outcomes for experiments; proposed solutions to a problem must be testable

Identifying Variables: stating the changeable factors that can affect an experiment; important to change only the variable being tested and keep the rest constant

Defining Variables: explaining how to measure a variable in an experiment

Designing Investigations: designing an experiment by identifying materials and describing appropriate steps in a procedure to test a hypothesis

Experimenting: carrying out an experiment by carefully following directions of the procedure so the results can be verified by repeating the procedure several times

Acquiring Data: collecting qualitative and quantitative data as observations and measurements

Organizing Data: making data tables and graphs for data collected

Analyzing Investigations: interpreting data, identifying errors, evaluating the hypothesis, formulating conclusions, and recommending further testing when necessary
### HEALTH

**HE.5.C.1.6** Students will:
Explain how human body parts and organs work together in healthy body systems, including the endocrine and reproductive systems.

### LANGUAGE ARTS

**LAFS.5.RI.1.3** Students will:
Explain the relationship or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.

**LAFS.5.RI.2.4** Students will:
Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.

**LAFS.5.RI.4.10** Students will:
By the end of the year, read and comprehend information texts, including history/social studies, science, and technical texts, at the high end of the grades 4-5 text complexity band independently and proficiently.

**LAFS.5.SL.1.1** Students will:
Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others’ ideas and expressing their own clearly.

  a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
  b. Follow agreed-upon rules for discussions and carry out assigned roles.
  c. Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others.
  d. Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.

**LAFS.5.W.3.8** Students will:
Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.

**LAFS.5.W.3.9** Students will:
Draw evidence from literary or informational texts to support analysis, reflection, and research.

  a. Apply grade 5 Reading standards to literature (e.g., “Compare and contrast two or more characters, settings, or events in a story or a drama, drawing on specific details in the text [e.g., how characters interact]").
  b. Apply grade 5 Reading standards to information texts (e.g., “Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point[s]”).

### MATHEMATICS

**MAFS.5.G.1.1** Students will:
Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., $x$-axis and $x$-coordinate, $y$-axis and $y$-coordinate).

**MAFS.1.MD.2.2** Students will:
Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.

### TECHNOLOGY

**Creativity and innovation** Students will:
Demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.

**Communication and collaboration** Students will:
Use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.

**Research and informational fluency** Students will:
Apply digital tools to gather, evaluate, and use information.

**Critical thinking, problem solving, and decision making** Students will:
Use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

**Digital Citizenship** Students will:
Understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.

**Technology operations and concepts** Students will:
Demonstrate a sound understanding of technology concepts, systems, and operations.
Students will:

Make sense of problems and persevere in solving them. (SMP.1)
Solving a mathematical problem involves making sense of what is known and applying a thoughtful and logical process which sometimes requires perseverance, flexibility, and a bit of ingenuity.

Reason abstractly and quantitatively. (SMP.2)
The concrete and the abstract can complement each other in the development of mathematical understanding: representing a concrete situation with symbols can make the solution process more efficient, while reverting to a concrete context can help make sense of abstract symbols.

Construct viable arguments and critique the reasoning of others. (SMP.3)
A well-crafted argument/critique requires a thoughtful and logical progression of mathematically sound statements and supporting evidence.

Model with mathematics. (SMP.4)
Many everyday problems can be solved by modeling the situation with mathematics.

Use appropriate tools strategically. (SMP.5)
Strategic choice and use of tools can increase reliability and precision of results, enhance arguments, and deepen mathematical understanding.

Attend to precision. (SMP.6)
Attending to precise detail increases reliability of mathematical results and minimizes miscommunication of mathematical explanations.

Look for and make use of structure. (SMP.7)
Recognizing a structure or pattern can be the key to solving a problem or making sense of a mathematical idea.

Look for and express regularity in repeated reasoning. (SMP.8)
Recognizing repetition or regularity in the course of solving a problem (or series of similar problems) can lead to results more quickly and efficiently.
The Science Curriculum Map has been developed by teachers for ease of use during instructional planning. Terminology found within the framework of the curriculum map is defined below.

**Next Generation Sunshine State Standards (NGSSS):** a set of content and process science standards that define with specificity what teachers should teach and students should know and be able to do; adopted by the Florida State Board of Education in 2008

**NGSSS Body of Knowledge:** the broadest organizational structure used to group content and concepts within the curriculum map and include the following: Nature of Science, Earth Science, Physical Science and Life Science (also known as Reporting Category)

**Standard/Big Idea:** an overarching organizational structure used to describe the scope of a selected group of benchmarks; *for example, The Characteristics of Science Knowledge, Earth Systems and Patterns, Forms of Energy, and Interdependence*

**Unit of Study:** an overarching organizational sub-structure comprised of a collection of topics used to group content and concepts for a more narrow focus

**Topics:** a grouping of benchmarks and skills that form a subset of scientific concepts covered in each unit of study

**Benchmarks:** the required NGSSS expectations presented in the course descriptions posted on CPALMS by FLDOE

**Learning Targets/Skills:** the content knowledge, processes, and enabling skills that will ensure successful mastery of the benchmarks

**Vocabulary:** the content terminology and other academic language and phrases that support mastery of the learning targets and skills; for teacher- and student-use alike

**Prerequisite Learning:** the benchmarks assigned to previous grade levels that support learning within the current grade level

**Pacing:** a recommendation of time frames for initial delivery of instruction and assessment in preparation for that occurs on the grade 5 Statewide Science Assessment (SSA) including “fair game” content review

**Teacher Hints:** a listing of considerations when planning for instruction; may include suggestions or ideas for review

**Resource Alignment:** a listing of available, high quality and benchmark-aligned materials including: labs, strategies, lessons, and videos from textbook and other media sources. All suggested resources may be accessed in Canvas.

**STEM:** interdisciplinary, standards-rich experience that poses an age-appropriate, real-world problem to be solved through collaborative and creative measures. STEM lessons may be accessed in Canvas.

**Formative Assessment Strategies:** techniques that can be used before, during, and after instruction to evaluate student learning. The Formative Assessment Strategies document may be accessed in Canvas.

The District Science Office recommends that all students engage in hands-on, minds-on science experiences DAILY.