

## 5<sup>th</sup> Grade Science Overview 2022 - 2023

This document is designed to provide parents/guardians/community an overview of the curriculum taught in the FBISD classroom. This document supports families in understanding the learning goals for the course, and how students will demonstrate what they know and are able to do. The overview offers suggestions or possibilities to reinforce learning at home.

Included at the end of this document, you will find:

- A [glossary](#) of curriculum components
- The content area [instructional model](#)
- [Parent resources](#) for this content area

To advance to a particular grading period, click on a link below.

- [Grading Period 1](#)
- [Grading Period 2](#)
- [Grading Period 3](#)
- [Grading Period 4](#)

### Process Standards

The process standards describe ways in which students are expected to engage in the content. The process standards weave the other knowledge and skills together so that students may be successful problem solvers and use knowledge learned efficiently and effectively in daily life.

5.1A Demonstrate safe practices and the use of safety equipment as outlined in Texas Education Agency-approved safety standards during classroom and outdoor investigations using safety equipment, including safety goggles or chemical splash goggles, as appropriate, and gloves, as appropriate.

5.1B Make informed choices in the conservation, disposal, and recycling of materials.

5.2A Describe, plan, and implement simple experimental investigations testing one variable.

5.2B Ask well defined questions, formulate testable hypotheses, and select and use appropriate equipment and technology.

5.2C Collect and record information using detailed observations and accurate measuring.

5.2D Analyze and interpret information to construct reasonable explanations from direct (observable) and indirect (inferred) evidence.

5.2E Demonstrate that repeated investigations may increase the reliability of results.

5.2F Communicate valid conclusions in both written and verbal forms.

5.2G Construct appropriate simple graphs, tables, maps, and charts using technology, including computers, to organize, examine, and evaluate information.

5.3A Analyze, evaluate, and critique scientific explanations by using evidence, logical reasoning and experimental and observational testing.

5.3B Draw or develop a model that represents how something that cannot be seen such as the Sun, Earth, and Moon system and formation of sedimentary rock works or looks.

5.3C Connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists.

5.4A collect, record, and analyze information using tools, including calculators, microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, prisms, mirrors, balances, spring scales, graduated cylinders, beakers, hot plates, meter sticks, magnets, collecting nets, and notebooks; timing devices; and materials to support observations of habitats or organisms such as terrariums and aquariums.

## Grading Period 1

### Unit 1: Matter

Estimated Date Range: 8/10/22 – 9/30/22

Estimated Time Frame: 39 Days

#### Unit Overview:

In this unit, students will begin their learning by engaging in discussions about safety in science and the scientific practices that scientists follow when conducting investigations. They will continue by learning how to construct scientific explanations that contain a claim, evidence, and reasoning. Safety, scientific practices, and scientific explanations are process skills that are introduced in this unit and will be practiced throughout the entire year. The unit focuses on the study of physical properties of matter; therefore, students will classify matter based on measurable, testable, and observable physical properties. In 4th grade, students studied physical properties that included mass, volume, states (solid, liquid, and gas), temperature, magnetism, and the ability to sink or float. 5th graders are expected to classify matter based on the physical properties of mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating using water as a reference point), solubility in water, and the ability to conduct or insulate thermal energy or electric energy. In addition, students will explore, compare, and contrast mixtures, including solutions.

#### At home connections:

- Discuss ways that students can be safe during science time. Emphasize the points discussed in the Science Safety Contract your child's teacher will send home. Discuss the importance of following the safety rules and wearing safety equipment.
- Conduct simple experimental investigation with your child at home following Scientific Practices studied in class. Help your child select a good topic to conduct an investigation about. Guide your child to create a good question, formulate a hypothesis, identify variables, perform multiple trials, collect and record data, and write conclusions that include a claim, evidence, and reasoning. For ideas about possible investigations to conduct, click [here](#).
- Use objects from home to classify matter according to physical properties of matter. The physical properties include observable properties such as color, shape, texture, and state of matter; measurable properties such as mass, volume, and temperature; and testable properties such as magnetism, ability to conduct electrical and thermal energy, and solubility.
- Conduct investigations at home about mixtures by using common objects and substances from home. Help your child understand that solutions are types of mixtures. In a mixture that is not a solution, the physical properties of the ingredients do not change after the ingredients have been combined. In mixtures that are solutions, the physical properties of the ingredients change after they have been combined.

Concepts within Unit #1 <a href="#">Link to TEKS</a>	Success Criteria for this Concept
Concept #1: Safety 5.1A	<ul style="list-style-type: none"> <li>• Determine what safety practices must be followed and what safety equipment must be used in different situation.</li> </ul>
Concept #2: Scientific Practices 5.2A, 5.2B, 5.2C, 5.2E, 5.2G, 5.4A	<ul style="list-style-type: none"> <li>• Create a well-defined question for a scientific investigation.</li> <li>• Formulate a hypothesis for a scientific investigation.</li> <li>• Identify variables in a scientific investigation.</li> <li>• Perform multiple trials when conducting a scientific investigation.</li> <li>• Collect data by using scientific tools when conducting a scientific investigation.</li> <li>• Record data by using a data table when conducting a scientific investigation.</li> </ul>
Concept #3: Scientific Explanations 5.2D, 5.2F	<ul style="list-style-type: none"> <li>• Make an accurate claim based on data.</li> <li>• Identify pieces of evidence that support the claim.</li> <li>• Create reasoning by connecting the claim and evidence to explain a scientific concept.</li> </ul>

<p>Concept #4: Physical Properties of Matter 5.5A</p>	<ul style="list-style-type: none"> <li>Measures mass by using triple beam balances, temperature by using thermometers, and volume by using graduated cylinders, and beakers.</li> <li>Records mass, temperature, and volume by using the Metric System. Mass in Kilograms (Kg) or grams (g); temperature in Celsius (°C); volume in Liters (L) or milliliters (mL).</li> <li>Classifies matter based on color, shape, texture, mass, volume, temperature, and physical state (solid, liquid, and gas).</li> <li>Justifies why matter was classified as having a specific color, shape, texture, mass, volume, temperature; and being either a solid, liquid, or a gas.</li> <li>Classifies matter based on the properties of magnetism, solubility, conductivity of thermal and electrical energy, and relative density.</li> <li>Justifies why matter was classified as magnetic or nonmagnetic, soluble or not soluble in water, conductor or insulator of thermal and electrical energy, and denser or less dense than water.</li> </ul>
<p>Concept #5: Mixtures 5.5C, 5.5B, 5.5A</p>	<ul style="list-style-type: none"> <li>Explains that mixtures maintain the physical properties of their individual ingredients.</li> <li>Identifies changes that occur in the physical properties of the ingredients of solutions.</li> </ul>

**Unit 2: Force, Motion, and Energy**

Estimated Date Range: 10/3/22 – 10/7/22

Estimated Time Frame: 5 Days

**Unit Overview:**

In this unit, students will explore different types of energy and their uses, including mechanical, light, thermal, electrical, and sound energy. In 4th grade, students compared and contrasted different forms of energy, and conductors and insulators of thermal and electrical energy. The focus in 5<sup>th</sup> grade is about the uses of the different forms of energy. This unit will be continued in the second grading period.

**At home connections:**

- Discuss the uses of different types of energy. Provide examples about the type of energy used and produced by different household objects such as TV, computer, lamp, microwave, etc.

<p><b>Concepts within Unit #2</b> <a href="#">Link to TEKS</a></p>	<p><b>Success Criteria for this Concept</b></p>
<p>Concept #1: Uses of Energy 5.6A</p>	<ul style="list-style-type: none"> <li>Identifies the form of energy (mechanical, light, thermal, electrical, or sound energy) that objects use and produce.</li> <li>Provides examples on how each form of energy is used in everyday life.</li> </ul>

## Grading Period 2

### Unit 2: Force, Motion, and Energy (Continued)

Estimated Date Range: 10/11/22 – 11/11/22

Estimated Time Frame: 23 Days

#### Unit Overview:

In this continuation of unit 2 from the first grading period, students will also have the opportunity to explore more in depth the concept of electrical and light energy. When studying electrical energy, students will be expected to build circuits that are connected in series and parallel to determine if there is a flow of electricity when a circuit is opened or closed. When studying light energy, students will be expected to manipulate different materials and evaluate how light behaves (absorb/reflect/refract) when it strikes those materials. This will be students' first exposure to the behaviors of light in elementary grades. In addition, students will explore common forces such as gravity, friction, and magnetism. Students will then design an experimental investigation on their own to test the effects these various forces on objects. In 5th grade, students must design fair investigations and include the identification of control, independent, and dependent variables.

#### At home connections:

- Investigate how light reacts when it strikes objects such as mirrors and lenses. Have students draw how light bounces off mirrors (reflection) and bends when it goes through transparent materials such as lenses (refraction).
- Help your child create virtual circuits [here](#). Engage in discussions about what makes the circuit work.
- When studying forces, students are learning about the effects of friction, gravity, and magnetism. Help your child design an investigation that can test the effects of those forces on objects by using ramps and surfaces of different textures.

Concepts within Unit #2 <a href="#">Link to TEKS</a>	Success Criteria for this Concept
Concept #2: Light Energy 5.6C	<ul style="list-style-type: none"> <li>• Explains that light energy travels in a straight line.</li> <li>• Explains and predicts how light behaves when it strikes an object and is reflected.</li> <li>• Explains and predicts how light behaves when it travels through one medium to another and is refracted.</li> </ul>
Concept #3: Electrical Energy 5.6B	<ul style="list-style-type: none"> <li>• Explains how the flow of electricity in closed circuits with one and multiple path of electricity can produce light, heat, or sound.</li> <li>• Predicts if circuits will work when using switches or part of the system is broken/not working.</li> </ul>
Concept #4: Forces 5.6D	<ul style="list-style-type: none"> <li>• Designs an experimental investigation that tests the effects of force (friction, gravity, or magnetism) on an object.</li> <li>• Explains the effects of gravity, friction, and magnetism on objects.</li> <li>• When given a partial description of an investigation, determines the question, materials, variables, and procedures to test the effect of forces on objects.</li> </ul>

## Unit 3: Earth's Surface

Estimated Date Range: 11/14/22 – 12/16/22

Estimated Time Frame: 20 Days

#### Unit Overview:

In this unit, students will learn how wind, water, and ice cause changes to Earth's surface through the processes of weathering, erosion, and deposition, and how these processes create landforms such as canyons, deltas and sand dunes. In 4th grade, students identified how the processes of weathering, erosion, and deposition cause slow changes to Earth's surface. In 5th grade, this concept becomes more specific as students are required to identify landforms and the specific processes that led to their changes overtime. Students will also explore the processes that led to the formation of sedimentary rock and fossil fuels. In 5<sup>th</sup>

grade, students are expected to sequence these events and describe the processes involve in every step of the formation of sedimentary rocks and fossil fuels.

**At home connections:**

- With parental supervision, students can go outside and find evidence of weathering, erosion, and deposition on the ground. Students can create illustrations that describe the processes of weathering, erosion, and deposition and explain how those processes change the Earth’s surface.
- Using Google Earth, help your child locate different landforms in the state or country such the Guadalupe Peak in Texas or the Grand Canyon in Arizona. Discuss with students how the landforms have changed overtime due to the actions of weathering, erosion, and deposition.
- Guide students to create a paragraph, a graphic organizer, or comic book that sequences the processes that led to the formation of sedimentary rocks and fossil fuels.

<b>Concepts within Unit #3</b> <a href="#">Link to TEKS</a>	<b>Success Criteria for this Concept</b>
Concept #1: Changes on Earth’s Surface 5.7B	<ul style="list-style-type: none"> <li>• Recognizes and explains how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface caused by weathering, erosion, and deposition using models and diagrams.</li> <li>• Identifies agents (water, wind, and/or ice) that caused slow changes to Earth's surface.</li> </ul>
Concept #2: Formation of Sedimentary Rocks and Fossil Fuels 5.7A	<ul style="list-style-type: none"> <li>• Explains the processes that led to the formation of sedimentary rocks.</li> <li>• Explains the processes that led to the formation of fossil fuels.</li> </ul>

## Grading Period 3

### Unit 4: Patterns in the Natural World

Estimated Date Range: 1/5/23 – 2/10/23

Estimated Time Frame: 26 Days

**Unit Overview:**

In this unit, students will deepen their understanding about the water cycle by determining the role that the sun and the oceans play in it. Students are expected to build a model to identify the sun and the ocean’s roles. When studying weather students, are expected to know the difference between weather and climate. This is the first time elementary students will encounter the concept of climate. In order to differentiate between these two concepts, students will need to examine data tables to identify that weather refers to the everyday changes in conditions of the atmosphere, while climate refers to patterns on those conditions over time. In this unit, students will also demonstrate the effects of Earth's rotation on our planet. These effects include the day/night cycle and the apparent movement of the Sun in the sky. Students will describe the relationship between the Sun, Earth, and Moon and demonstrate the Earth's rotation. In addition, students are expected to compare the characteristics of the Sun, Earth, and Moon.

**At home connections:**

- Discuss the role that the sun and ocean play in the water cycle by constructing a simple model that represents the water cycle. For example, set up water in a container outside and inside. Measure the amount of water evaporated. Discuss the role of the sun in the evaporation process. Discuss what the water in the container represented.
- Help your child distinguish between weather data and climate data by examining a weather website such as Weather Underground. Select a city and observe the data presented (weather data – shows the weather conditions at the time). Explore the history tab and examine the data presented (climate data – shows the average weather conditions overtime).
- Help your child track the apparent movement of the Sun in the sky by constructing a sun dial. Discuss how the Earth’s rotation is responsible for the day/night cycle and the apparent movement of the Sun in the sky.

Concepts within Unit #4 <a href="#">Link to TEKS</a>	Success Criteria for this concept
Concept #1: Water Cycle 5.8B	<ul style="list-style-type: none"> <li>• Explains the role that the sun and the oceans play in the water cycle and how they interact with each other.</li> </ul>
Concept #2: Weather and Climate 5.8A	<ul style="list-style-type: none"> <li>• Differentiates between weather and climate.</li> </ul>
Concept #3: Earth’s Cycles 5.8C	<ul style="list-style-type: none"> <li>• Explains the cause and effect relationship between the Earth's rotation and the day and night cycle.</li> <li>• Explains the cause and effect relationship between the Earth's rotation and the apparent movement of the sun across the sky.</li> <li>• Explains the causes and effect relationship between the Earth's revolution and the seasonal pattern on Earth.</li> </ul>
Concept #4: Earth, Moon, and Sun 5.8D	<ul style="list-style-type: none"> <li>• Identifies and compares the physical characteristics of the Earth, Sun, and Moon.</li> </ul>

**Unit 5: Ecosystems**

Estimated Date Range: 2/13/23 – 3/10/23

Estimated Time Frame: 18 Days

**Unit Overview:**

In this unit, students will explore the relationships, systems, and cycles within environments. Students will review the characteristics of different environments studied in previous grade levels and determine how organisms interact with living and non-living things in order to survive. Students will also trace the flow of energy between organisms in a food web and infer how changes in one population may affect another. This unit will be continued in the fourth grading period.

**At home connections:**

Engage your child in observations of nature by visiting a place such as a garden, a yard, a park, etc.

- Help your child make connections to understand how animals and plants depend on each other to survive. Help your child see that animals and plants depend on each other for food or shelter. They also depend on the environment to provide sunlight, air, and water.
- When observing animals and plants, prompt your child to identify the organisms observed as a producer (makes its own food), consumer (depends on other organisms for food), and decomposer (breaks down organic matter).
- Encourage your child to think about the food chains and food webs that can be formed with the animals and plants that live in the environment you are observing. Review that the flow of energy in a diagram of the food chain or food web is always pointing at the organism receiving the energy.

<b>Concepts within Unit #5</b> <a href="#">Link to TEKS</a>	<b>Success Criteria for this Concept</b>
Concept #1: Interactions within Ecosystems 5.9A	<ul style="list-style-type: none"> <li>• Explains ways that organisms live and survive in their ecosystems by interacting with the living and nonliving components.</li> </ul>
Concept #2: Food Webs 5.9B	<ul style="list-style-type: none"> <li>• Describes the flow of energy within food chains and food webs.</li> <li>• Explains the role of the sun, producers, consumers, and decomposers in a food chain and food web.</li> </ul>

## Grading Period 4

### Unit 5: Ecosystems (Continued)

Estimated Date Range: 3/20/23 – 3/24/23

Estimated Time Frame: 5 Days

**Unit Overview:**

In this continuation of the ecosystems unit from the third grading period, students will describe how changes to ecosystems affect the organisms within the system. Students will predict the possible effects on ecosystems that can be caused by natural disasters, changes to the Earth over time, human interaction, and the actions of other organisms. In addition, students will recognize the role of fossils in understanding how ecosystems have changed over long periods of time.

**At home connections:**

- Discuss with your child the effects that a change in the environment such as a wildfire, drought, or human interactions could have on the organisms that live there. Point out that these changes could affect the food chains and food webs of the organisms.
- Discuss with your child that fossils give us clues of the past environments that existed in the past. Finding fossils of fish and shells buried deep in the ground is evidence that the current environment was under water thoughts of years ago. Finding fossils of palm trees is evidence that the current environment was a fertile environment with warm weather.

<b>Concepts within Unit #5</b> <a href="#">Link to TEKS</a>	<b>Success Criteria for this Concept</b>
Concept #3: Changes to Ecosystems 5.9C	<ul style="list-style-type: none"> <li>• Predicts the effects of changes in ecosystems caused by living organisms.</li> </ul>
Concept #4: Fossils as Evidence 5.9D	<ul style="list-style-type: none"> <li>• Identifies fossils as evidence of past living organisms and the nature of the environments at the time by using models and diagrams.</li> </ul>

### Unit 6: Organisms

Estimated Date Range: 3/27/23 – 4/28/23

Estimated Time Frame: 24 Days

**Unit Overview:**

In this unit, students will learn in about the various types of structures (body parts) and functions (what those body parts do) of plants and animals that enable them to survive in their specific ecosystem. Students will learn that some characteristics that plants and animals have are inherited; therefore, they are pass on from parents to offspring. Students will also learn that some organisms exhibit behaviors that are learned during the organisms' lifetime. In 5<sup>th</sup> grade, students to be able to differentiate examples of inherited traits and learned behaviors.

**At home connections:**

- Students need to be able to compare the structures (parts of the body) and functions (what the body parts do) of different animals and plants. With adult supervision, encourage your child to find pictures of different birds. Examine the structures of the birds such as their beak, feathers, feet, etc. Compare the different structures and what they do (function). Repeat this with animals such a fish and mammals.
- Play a game with your child to distinguish between inherited traits (features that are pass on from parents to offspring such as hair color, eye color, and animal fur) and learned behaviors (behaviors that organisms exhibit after learning them such a dog playing fetch or humans reading and writing). During the game, each participant has to list the most inherited traits they can think of. Then, participants will list all the learned behaviors they can think of. The winner is the participant with the most correct answers.

<b>Concepts within Unit #6</b> <a href="#">Link to TEKS</a>	<b>Success Criteria for this Concept</b>
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<p>Concept #1: Structures and Functions 5.10A</p>	<ul style="list-style-type: none"> <li>• Compares structures and functions of different species that help them live and survive in a specific environment.</li> </ul>
<p>Concept #2: Inherited Traits and Learned Behaviors 5.10B</p>	<ul style="list-style-type: none"> <li>• Differentiates between inherited traits and learned behaviors of organisms.</li> </ul>
<p><b>Unit 7: STEM</b> Estimated Date Range: 5/1/23 – 5/25/23 Estimated Time Frame: 19 Days</p>	
<p><b>Unit Overview:</b> In this unit, students will explore the engineering process to solve real-world problems. Students will have opportunities to follow the engineering design cycle to analyze a problem, brainstorm solutions, design a product, test, and re-design a product to find the best solution.</p> <p><b>At home connections:</b></p> <ul style="list-style-type: none"> <li>• STEM activities require problem solving skills and critical thinking to be solved. Engage with your child in solving some of these challenges together to apply the science concepts learned throughout the year. For ideas on STEM activities, click <a href="#">here</a>.</li> </ul>	
<p><b>Concepts within Unit #7</b> <a href="#">Link to TEKS</a></p>	<p><b>Success Criteria for this Concept</b></p>
<p>Concept #1: STEM 5.1A, 5.1B, 5.2A, 5.2B, 5.2C, 5.2D, 5.2E, 5.2F, 5.2G, 5.3A, 5.3B, 5.3C, 5.4A</p>	<ul style="list-style-type: none"> <li>• Uses critical thinking and scientific problem solving to make informed decisions.</li> <li>• Analyzes, evaluates, and critiques scientific explanations by using evidence, logical reasoning, and experimental and observational testing.</li> </ul>

**Glossary of Curriculum Components**

**Overview**— The content in this document provides an overview of the pacing and concepts covered in a subject for the year.

**TEKS** – Texas Essential Knowledge and Skills (TEKS) are the state standards for what students should know and be able to do.

**Unit Overview** – The unit overview provides a brief description of the concepts covered in each unit.

**Concept** – A subtopic of the main topic of the unit.

**Success Criteria**—a description of what it looks like to be successful in this concept.

**Competency**—Standards-Based Grading communicates students’ understanding of the Texas Essentials Knowledge and Skills (TEKS). Using the TEKS, teachers developed grade-level competencies to communicate student progress in the Standards-Based gradebook. The competencies are the same for each grade-level content area (i.e. 1st grade math) across the district. Teachers report students’ progress on the competencies using learning progressions.

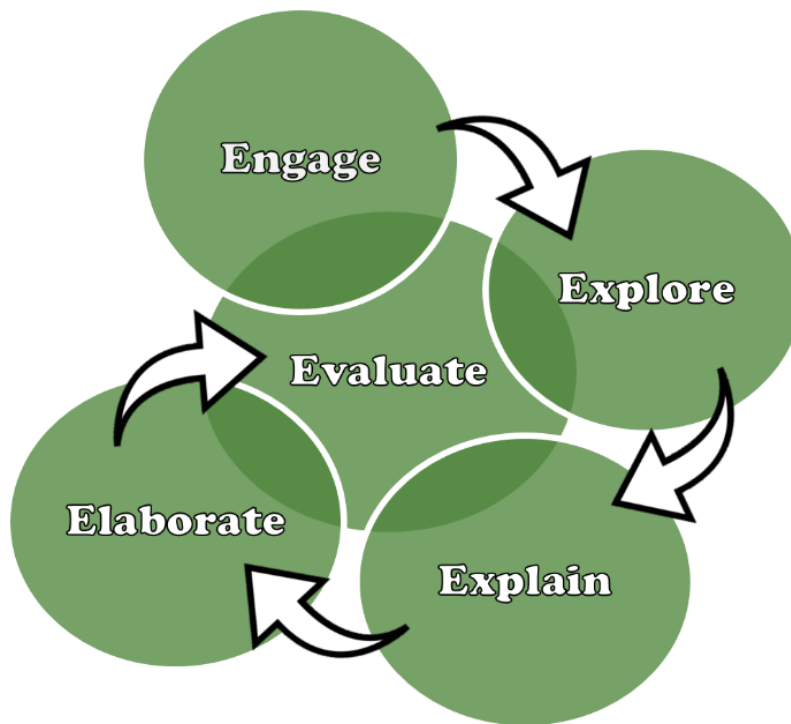
**Parent Resources**

The following resources provide parents with ideas to support students’ understanding. For sites that are password protected, your child will receive log-in information through their campus.

Resource	How it supports parents and students
<a href="#">Pebble Go</a>	This resource provides access to books for reading and learning more about concepts in the science content.
<a href="#">Brainpop</a>	This resource provides access to videos and games.
<a href="#">Britannica School</a>	This is an information resource for elementary students. It has encyclopedia articles, multimedia, primary sources, games, and other learning resources that support student learning.
<a href="#">Ebsco Host</a>	This online reference system serves all content areas.
<a href="#">World Book</a>	World Book contains thousands of informational articles with stunning illustrations, videos, interactive maps, and activities.
<a href="#">National Geographic Kids</a>	This resource is a fact-filled, fast-paced magazine created especially for ages 6 and up. It has an award-winning combination of photos, facts, and fun.

### Instructional Model

The structures, guidelines or model in which students engage in a particular content that ensures understanding of that content.



The 5E Model is an inquiry-based approach to teaching and learning science concepts over time. It is research-based and emphasizes that children build conceptual understanding and make meaning through experiences. Each “E” represents a stage in a learning cycle.

- **Engage**: The engage phase sparks student curiosity and assesses prerequisite knowledge or misconceptions.
- **Explore**: Students begin to interact with the content through hands-on explorations and investigations.
- **Explain**: The explain phase connects the hands-on experience to the instruction of the concept using grade level appropriate definitions and labels.
- **Elaborate**: Elaboration applies the concept in a new context through problem solving or an additional hands-on experience.
- **Evaluate**: Evaluation of student understanding and progress occurs throughout the learning cycle.