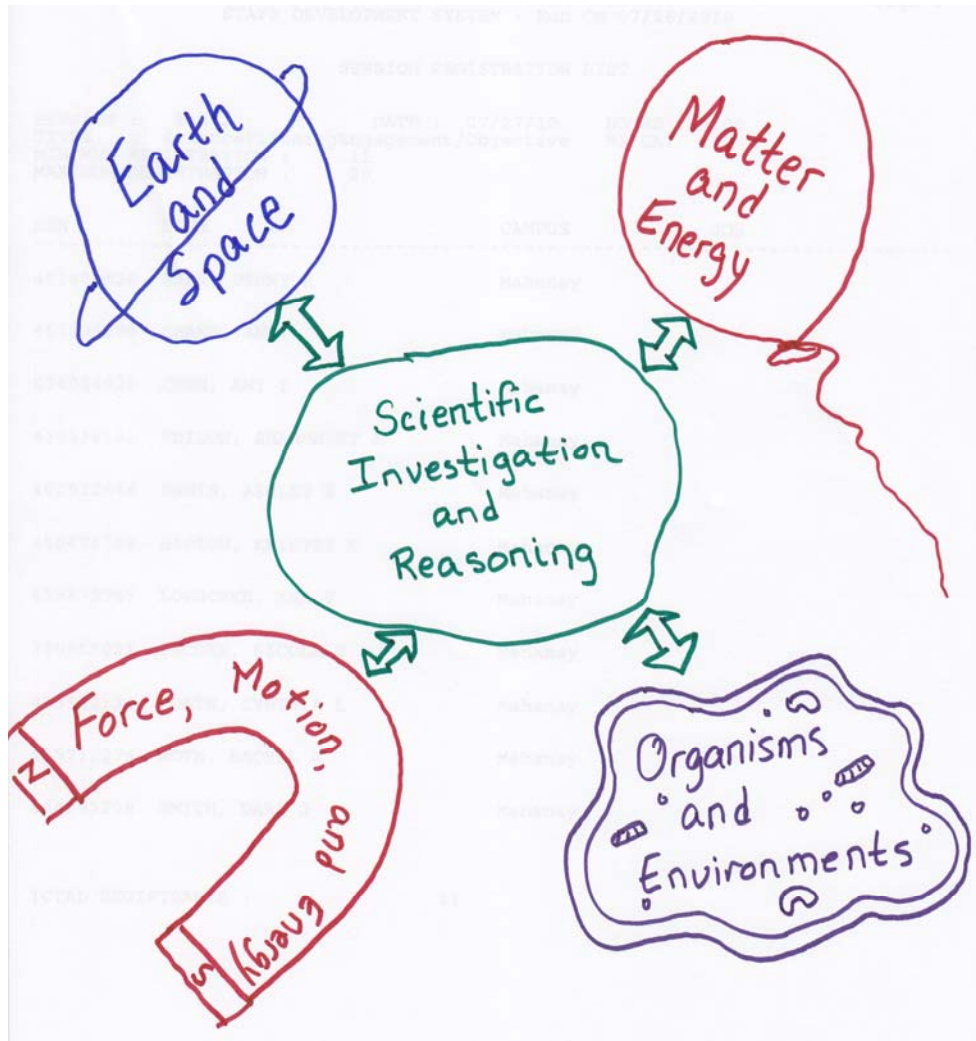




Independent School District



Grade 2
SCIENCE



Grade 2 SCIENCE Curriculum

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Grade 2 SCIENCE Curriculum

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| | | |
|-----------------|---|---|
| First Semester | 1 st Nine Weeks | 2 nd Nine Weeks |
| | <p><u>Unit 1:</u> Safety & Conservation (1 week)</p> <p>Scientific Tools (1 week)</p> <p>Descriptive Investigation (2 weeks)</p> <p><u>Unit 2:</u> Natural Resources vs. Man-Made Resources (4 weeks)</p> <p>Weather (1 week)</p> | <p><u>Unit 2:</u> Weather (2 weeks)</p> <p>Water Cycle (4 weeks)</p> <p>Review & Assessment (1 week)</p> <p><u>Unit 3:</u> Physical Properties of Matter (2 weeks)</p> |
| Second Semester | 3 rd Nine Weeks | 4 th Nine Weeks |
| | <p><u>Unit 3:</u> Physical Properties of Matter (1 week)</p> <p>Changes in Matter (2 weeks)</p> <p><u>Unit 4:</u> Magnetism (2 weeks)</p> <p>Forces & Motion (1 week)</p> <p>Sound (1 week)</p> <p>Review & Assessment (1 week)</p> <p><u>Unit 5:</u> Physical Characteristics of Plants (1 week)</p> | <p><u>Unit 5:</u> Physical Characteristics of Plants (1 week)</p> <p>Adaptations for Survival (2 weeks)</p> <p>Life Cycles (2 weeks)</p> <p>Interdependence (1 week)</p> <p>Review & Assessment (2 weeks)</p> <p>Research—Organisms & Environmental Concepts (2 weeks)</p> |

Grade 2 Science Pacing Guide

| Unit 1: Scientific Investigation and Reasoning | | TEKS |
|--|---------------------------|--|
| 1 Week | Safety & Conservation | 2.1A identify and demonstrate safe practices as described in the Texas Safety Standards during classroom and outdoor investigations, including wearing safety goggles, washing hands, and using materials appropriately 2.1B describe the importance of safe practices 2.1C identify and demonstrate how to use, conserve, and dispose of natural resources and materials such as conserving water and reuse or recycling of paper, plastic, and metal |
| 1 Week | Scientific Tools | @2.4B measure and compare organisms and objects using non-standard units that approximate metric units 2.4A collect, record, and compare information using tools, including computers, hand lenses, rulers, primary balances, plastic beakers, magnets, collecting nets, notebooks, and safety goggles; timing devices, including clocks and stopwatches ; weather instruments such as thermometers , wind vanes, and rain gauges; and materials to support observations of habitats of organisms such as terrariums and aquariums |
| 2 Weeks | Descriptive Investigation | 2.2A ask questions about organisms, objects, and events during observations and investigations @2.2B plan and conduct descriptive investigations such as how organisms grow 2.2C collect data from observations using simple equipment such as hand lenses, primary balances, thermometers, and non-standard measurement tools 2.2D record and organize data using pictures, numbers, and words 2.2E communicate observations and justify explanations using student-generated data from simple descriptive investigations 2.2F compare results of investigations with what students and scientists know about the world |
| | Critical Thinking | 2.3B make predictions based on observable patterns |

Grade 2 Science Pacing Guide

| Unit 2: Earth and Space | | TEKS |
|-------------------------|---|--|
| 4 Weeks | Natural Resources vs. Man-Made Resources | 2.7C distinguish between natural and manmade resources 1.7A observe, compare, describe, and sort components of soil by size, texture, and color 2.7A observe and describe rocks by size, texture, and color 2.7B identify and compare the properties of natural sources of freshwater and saltwater |
| 3 Weeks | Weather | @2.8A measure, record, and graph weather information, including temperature, wind conditions, precipitation, and cloud coverage, in order to identify patterns in the data 3.8A observe, measure, record, and compare day-to-day weather changes in different locations at the same time that include air temperature, wind direction, and precipitation |
| 4 Weeks | The Water Cycle | @2.8C explore the processes in the water cycle, including evaporation, condensation, and precipitation, as connected to weather conditions |
| 1 Week | Review & Assessment | Review Concepts District Common Assessment |

Grade 2 Science Pacing Guide

| Unit 3: Matter and Energy | | TEKS |
|---------------------------|-------------------------------|---|
| 3 Weeks | Physical Properties of Matter | <p>Ⓢ2.5A classify matter by physical properties, including shape, relative mass, relative temperature, texture, flexibility, and whether material is a solid or liquid</p> <p>2.5C demonstrate that things can be done to materials to change their physical properties such as cutting, folding, sanding, and melting</p> <p>2.5D combine materials that when put together can do things that they cannot do by themselves such as building a tower or a bridge and justify the selection of those materials based on their physical properties</p> |
| 2 Weeks | Changes in Matter | <p>Ⓢ2.5B compare changes in materials caused by heating and cooling</p> <p>2.5C demonstrate that things can be done to materials to change their physical properties such as cutting, folding, sanding, and melting</p> <p>2.6A Investigate the effects on an object by increasing or decreasing amounts of light, heat, and sound energy such as how the color of an object appears different in dimmer light or how heat melts butter</p> |

| Unit 4: Force, Motion, and Energy | | TEKS |
|-----------------------------------|---------------------|---|
| 2 Weeks | Magnetism | <p>Ⓢ2.6B observe and identify how magnets are used in everyday life</p> <p>K.6B explore interactions between magnets and various materials</p> <p>1.6B predict and describe how a magnet can be used to push or pull an object</p> |
| 1 Week | Forces & Motion | <p>2.6C trace the changes in the position of an object over time such as a cup rolling on the floor and a car rolling down a ramp</p> <p>2.6D compare patterns of movement of objects such as sliding, rolling, and spinning</p> |
| 1 Week | Sound | <p>2.6A Investigate the effects on an object by increasing or decreasing amounts of light, heat, and sound energy such as how the color of an object appears different in dimmer light or how heat melts butter</p> |
| 1 Week | Review & Assessment | <p>Review Concepts</p> <p>Campus Common Assessment</p> |

Grade 2 Science Pacing Guide

| Unit 5: Organisms and Environments | | TEKS |
|------------------------------------|--|--|
| 2 Weeks | Physical Characteristics of Plants | 2.9A identify the basic needs of plants and animals Ⓣ2.10B observe, record, and compare how the physical characteristics of plants help them meet their basic needs such as stems carry water throughout the plant |
| 2 Weeks | Adaptations for Survival | 2.10A observe, record, and compare how the physical characteristics and behaviors of animals help them meet their basic needs such as fins help fish move and balance in the water Ⓣ2.9B identify factors in the environment, including temperature and precipitation, that affect growth and behavior such as migration, hibernation, and dormancy of living things |
| 2 Weeks | Life Cycles | Ⓣ2.10C investigate and record some of the unique stages that insects undergo during their life cycle |
| 1 Week | Interdependence | Ⓣ2.9C compare and give examples of the ways living organisms depend on each other and on their environments such as food chains within a garden, park, beach, lake, and wooded area 1.9C gather evidence of interdependence among living organisms such as energy transfer through food chains and animals using plants for shelter |
| 2 Weeks | Review & Assessment | Review Concepts District Common Assessment |
| 2 Weeks | Research – Organisms & Environmental Concepts | Internet research on organisms or environmental concepts |



Grade 2

For clarification, depth, and breadth of instruction, see curriculum documents.

| | |
|--|---|
| <i>Scientific Investigation and Reasoning</i> | |
| 2.2B | Plan and conduct descriptive investigations such as how organisms grow. |
| 2.4B | Measure and compare organisms and objects using non-standard units that approximate metric units. |
| <i>Earth and Space</i> | |
| 2.8A | Measure, record, and graph weather information including temperature, wind conditions, precipitation, and cloud coverage in order to identify patterns in the data. |
| 2.8C | Explore the processes in the water cycle including evaporation, condensation, and precipitation as connected to weather conditions. |
| <i>Matter and Energy</i> | |
| 2.5A | Classify matter by physical properties including shape, relative mass, relative temperature, texture, flexibility, and whether material is a solid or liquid. |
| 2.5B | Compare changes in materials caused by heating and cooling. |
| <i>Force, Motion, and Energy</i> | |
| 2.6B | Observe and identify how magnets are used in everyday life. |
| <i>Organisms and Environments</i> | |
| 2.9B | Identify factors in the environment, including temperature and precipitation that affect growth and behavior such as migration, hibernation, and dormancy of living things. |
| 2.9C | Compare and give examples of the ways living organisms depend on each other and on their environments, such as food chains within a garden, park, beach, lake, and wooded area. |
| 2.10B | Observe, record, and compare how the physical characteristics of plants help them meet their basic needs such as stems carry water throughout the plant. |
| 2.10C | Investigate and record some of the unique stages that insects undergo during their life cycle. |



Unit 1: Scientific Investigation and Reasoning

This curriculum guide was created as a resource for teaching science on a daily basis. This guide provides background and information for the unit and curriculum pages for each concept to provide suggested resources and timeline. It is expected that at least 60% of science be hands-on/minds-on active investigations that include quality interaction between and among students and teacher. Interactions should include reading, writing, listening, and speaking.

Student understandings will be assessed by the District Common Assessments (DCAs) which are based on the **generalization statements** in this guide.

This guide can be modified as needed within this unit to ensure students' success. These modifications would include those necessary to incorporate reteaching or for acceleration when students already own a concept. Additional resources that are available may be used providing they are aligned to the generalizations.

Critical Corollary Questions:

1. What do you want students to know and understand?
2. How will you know if they do?
3. What will you do if they do not?
4. What will you do if they do?

Grade 2 Science Curriculum Guide

| Unit 1 | | Safety & Conservation (1 week) | | | | | |
|--|--------|---|---------------------|---|-----------|--|--|
| Generalizations: | | I know that procedures must be followed to be safe. | | | | | |
| TEKS / Student Expectation: | | 2.1A identify and demonstrate safe practices as described in the Texas Safety Standards during classroom and outdoor investigations, including wearing safety goggles, washing hands, and using materials appropriately 2.1B describe the importance of safe practices 2.1C identify and demonstrate how to use, conserve, and dispose of natural resources and materials such as conserving water and reuse or recycling of paper, plastic, and metal | | | | | |
| Formal Assessment: | | Grade 5 TAKS: | | | | | |
| Clarifications: | | Students conduct an investigation following safety procedures. Safety should be an on-going objective that should be emphasized in every scientific investigation throughout the year. | | | | | |
| Notes to Teacher: | | <p>*Focus on the following 5 safety rules:</p> <ol style="list-style-type: none"> 1. Wait for teacher's directions 2. Think ahead 3. Be neat 4. Be careful 5. Do not eat or drink things <p>*These safety rules should be easily mastered in a few days; however, an entire week of plans is provided for this concept. If students master this concept in fewer days than suggested, start exploring objective 2.1B (Conservation).</p> | | | | | |
| Key Academic Vocabulary: | | | | | | | |
| rules | reglas | procedure | procedimiento | safety | seguridad | | |
| Vertical Alignment: | | | | | | | |
| 1st Grade | | | ← Before After → | 3rd Grade | | | |
| <p>© 1.1A recognize and demonstrate safe practices as described in the Texas Safety Standards during classroom and outdoor investigations, including wearing safety goggles, washing hands, and using materials appropriately</p> <p>1.1B recognize the importance of safe practices to keep self and others safe and healthy</p> <p>1.1C identify and learn how to use natural resources and materials, including conservation and reuse or recycling of paper, plastic, and metals</p> | | | | <p>3.1A demonstrate safe practices as described in the Texas Safety Standards during classroom and outdoor investigations, including observing a schoolyard habitat</p> <p>3.1B make informed choices in the use and conservation of natural resources by recycling or reusing materials such as paper, aluminum cans, and plastics</p> | | | |

Grade 2 Science Curriculum Guide

| Engage | Explore | Explain | Extend | Evaluate |
|---|--|--|--|----------|
| Safety & Conservation (1 week) | | | | |
| <p>Display different items that could be used in Science exploration, such as a glass with colored water, scissors, a ruler, etc.</p> <p>Lead a class discussion on how these items can be used safely.</p> | <p>As the class discusses safety in science, chart science safety rules and elaborate on their importance. Provide examples of situations in which safety rules would need to be followed.</p> <p>Remind the learners that the most important safety rule is to tell the teacher right away when a hazard occurs in the science lab.</p> | <p>Divide the class into small groups. Ask each group to take one safety rule and create a drawing/symbol or other visual representation for the rule.</p> <p>Ask students in small groups to create a skit demonstrating safe practices in Science.</p> | <p>Provide pictures/drawings of people being safe with science and people being careless. Ask the students to evaluate and describe how the drawing demonstrates safe or unsafe practices.</p> | |
| | | Textbook pgs. R16-R19 | | |

Grade 2 Science Curriculum Guide

| Unit 1 | Scientific Tools (1 week) |
|------------------------------------|--|
| Generalizations: | I know that a variety of scientific tools are useful in conducting a scientific investigation. |
| TEKS / Student Expectation: | <p>@2.4B measure and compare organisms and objects using non-standard units that approximate metric units</p> <p>2.4A collect, record, and compare information using tools, including computers, hand lenses, rulers, primary balances, plastic beakers, magnets, collecting nets, notebooks, and safety goggles; timing devices, including clocks and stopwatches ; weather instruments such as thermometers , wind vanes, and rain gauges; and materials to support observations of habitats of organisms such as terrariums and aquariums</p> |
| Formal Assessment: | Grade 2 DCAs: 2.4B; Grade 5 TAKS: |
| Clarifications: | The student uses age-appropriate tools and models to investigate the natural world. (TEKS §112.13) |
| Notes to Teacher: | <p>*Non-standard units in second grade will be used to approximate standard units.</p> <p>*2nd grade students should be able to compare non-standard measurements, including relative mass and relative temperature.</p> <p>*In 2nd grade students will discover that the use of standardized units is important when conducting fair measurements.</p> <p>*Bilingual – there is a discrepancy between the textbook and what has been used on TAKS to describe a beaker. The textbook refers to a beaker as <i>vaso de precipitación</i>, but on TAKS a beaker is referred to as <i>recipiente</i> or <i>vaso graduado</i>.</p> <p>*When exploring tools, concentrate in the tool itself and its proper use. Units of measurement will be discussed more formally in the Exploring Matter and Energy Unit.</p> |

Grade 2 Science Curriculum Guide

| Key Academic Vocabulary: | | | | | | | |
|--|------------|-------------|---------------------|---|----------------------------|--------|------------------------------|
| hand lens/ magnifying glass | lupa | clock | reloj | balance | balanza | ruler | regla |
| stopwatch | cronómetro | thermometer | termómetro | computer | computadora/ computador | beaker | recipiente/ vaso graduado |
| Vertical Alignment: | | | | | | | |
| 1 st Grade | | | ← Before After → | 3 rd Grade | | | |
| <p>©1.4B measure and compare organisms and objects using non-standard units 1.4A collect, record, and compare information using tools, including computers, hand lenses, primary balances, cups, bowls, magnets, collecting nets, notebooks, and safety goggles; timing devices, including clocks and timers; non-standard measuring items such as paper clips and clothespins; weather instruments such as classroom demonstration thermometers and wind socks; and materials to support observations of habitats of organisms such as aquariums and terrariums</p> | | | | <p>©3.4A collect, record, and analyze information using tools, including microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, wind vanes, rain gauges, pan balances, graduated cylinders, beakers, spring scales, hot plates, meter sticks, compasses, magnets, collecting nets, notebooks, sound recorders, and Sun, Earth, and Moon system models; timing devices, including clocks and stopwatches; and materials to support observation of habitats of organisms such as terrariums and aquariums 3.4B use safety equipment as appropriate, including safety goggles and gloves</p> | | | |

Grade 2 Science Curriculum Guide

| Engage | Explore | Explain | Extend | Evaluate | | | | |
|---|--|---------|--------|-----------|---|---|---|--|
| Scientific Tools (1 Week) | | | | | | | | |
| <p>Short discussion. What are some tools scientists use to complete their investigations? Generate a list on the board.</p> <p>Start each day with a short discussion question. Example: What tool does a scientist use to know how much mass an objects has?</p> | <p>In small groups students observe and measure different objects by using hand lenses, pan balances, thermometers, stopwatches/clocks, and rulers. <u>Note:</u> Use one day to explore and explain each tool.</p> <p>Students explain how they used the tool to measure different objects. Create a class chart with the tool's name and its use.</p> <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: black; color: white;"> <th style="width: 50%;">Tool</th> <th style="width: 50%;">Use</th> </tr> </thead> <tbody> <tr> <td>Hand lens</td> <td>Make objects look bigger to observe details in them</td> </tr> </tbody> </table> | Tool | Use | Hand lens | Make objects look bigger to observe details in them | <p>Journal: Have the students complete a journal entry for each day (this can be used as a closure activity).</p> <p>Students will explain the tool they studied.</p> | <p>Measuring Stations: Create an observation station in your science corner to observe/measure mass, time, length, and temperature.</p> | |
| Tool | Use | | | | | | | |
| Hand lens | Make objects look bigger to observe details in them | | | | | | | |
| | <p>Textbook pgs. R4-R10 http://education.wichita.edu/caduceus/examples/servings/what_is_a_gram.htm Section: "Now"</p> | | | | | | | |

Grade 2 Science Curriculum Guide

| Unit 1 Descriptive Investigation / Critical Thinking (2 weeks) | |
|--|---|
| Generalizations: | I know that the Scientific Method is a series of steps that scientists use to conduct investigations. |
| TEKS / Student Expectation: | 2.2A ask questions about organisms, objects, and events during observations and investigations ©2.2B plan and conduct descriptive investigations such as how organisms grow 2.2C collect data from observations using simple equipment such as hand lenses, primary balances, thermometers, and non-standard measurement tools 2.2D record and organize data using pictures, numbers, and words 2.2E communicate observations and justify explanations using student-generated data from simple descriptive investigations 2.2F compare results of investigations with what students and scientists know about the world 2.3B make predictions based on observable patterns |
| Formal Assessment: | Grade 2 DCAs: 2.2B; Grade 5 TAKS: |
| Clarifications: | The student develops abilities necessary to do scientific inquiry in classroom and outdoor investigations. (TEKS §112.13) |
| Notes to Teacher: | *The focus of these investigations has nothing to do with body parts. This is just an activity to engage students as the teacher teaches the Scientific Method. *We teach the scientific method as a linear model for scientific inquiry to facilitate student understanding and investigation. Current scientific practice considers the process of scientific inquiry to be fluid and cyclical, not necessarily linear. |

Grade 2 Science Curriculum Guide

| Key Academic Vocabulary: | | | | | | | |
|---|----------|---------------------|--|---------|----------|-------|-----------|
| question | pregunta | plan | planear | observe | observar | share | compartir |
| predict | predecir | investigate | investigar | record | anotar | | |
| Vertical Alignment: | | | | | | | |
| 1st Grade | | ← Before After → | 3rd Grade | | | | |
| <p>Ⓢ1.2A ask questions about organisms, objects, and events observed in the natural world</p> <p>1.2B plan and conduct simple descriptive investigations such as ways objects move</p> <p>1.2C collect data and make observations using simple equipment such as hand lenses, primary balances, and non-standard measurement tools</p> <p>1.2D record and organize data using pictures, numbers, and words</p> <p>1.2E communicate observations and provide reasons for explanations using student-generated data from simple descriptive investigations</p> <p>Ⓢ1.3B make predictions based on observable patterns</p> | | | <p>3.2A plan and implement descriptive investigations, including asking and answering questions, making inferences, and selecting and using equipment or technology needed, to solve a specific problem in the natural world</p> <p>3.2B collect data by observing and measuring using the metric system and recognize differences between observed and measured data</p> <p>3.2C construct maps, graphic organizers, simple tables, charts, and bar graphs using tools and current technology to organize, examine, and evaluate measured data</p> <p>3.2D analyze and interpret patterns in data to construct reasonable explanations based on evidence from investigations</p> <p>Ⓢ3.2E demonstrate that repeated investigations may increase the reliability of results</p> <p>Ⓢ3.2F communicate valid conclusions supported by data in writing, by drawing pictures, and through verbal discussion</p> <p>3.3B draw inferences and evaluate accuracy of product claims found in advertisements and labels such as for toys and food</p> | | | | |

Grade 2 Science Curriculum Guide

| Engage | Explore | Explain | Extend | Evaluate |
|---|--|---|---|----------|
| Descriptive Investigation / Critical Thinking (2 Weeks) | | | | |
| <p>Introduce the Scientific Method.</p> <p>Explain how to write well-defined scientific questions:</p> <p>*Something we can prove</p> <p>*How does ____ affect ____?</p> <p>*Does ____ affect ____?</p> <p>Practice writing well-defined scientific questions. Share.</p> | <p>Body Investigation</p> <p>Guided Experiment (1st week)</p> <p>Write a question using the format for a well-defined scientific question.</p> <p>Model how to make a prediction.</p> <p>Students write their own predictions.</p> <p>In small groups, the teacher will help the learners create a plan for a body investigation. The learners will investigate, observe, measure, and create tables to record information.</p> <p>The learner will then analyze the data and share their findings.</p> | <p>Scientific Investigation (2nd Week)</p> <p>In small groups, students choose their own scientific investigation and work to follow the Scientific Method:</p> <ul style="list-style-type: none"> * Ask questions * Predict * Plan * Investigate * Observe, and record * Share | <p>Ongoing:</p> <p>Students should use their science journals throughout the investigation to record their questions, predictions, plans, observations, data, and results.</p> | |
| | <p>Alief Elem. Science Web site > Professional Resources > Lesson Resources > Body Investigations</p> | | | |



Unit 2: Earth and Space

This curriculum guide was created as a resource for teaching science on a daily basis. This guide provides background and information for the unit and curriculum pages for each concept to provide suggested resources and timeline. It is expected that at least 60% of science be hands-on/minds-on active investigations that include quality interaction between and among students and teacher. Interactions should include reading, writing, listening, and speaking.

Student understandings will be assessed by the District Common Assessments (DCAs) which are based on the **generalization statements** in this guide.

This guide can be modified as needed within this unit to ensure students' success. These modifications would include those necessary to incorporate reteaching or for acceleration when students already own a concept. Additional resources that are available may be used providing they are aligned to the generalizations.

Critical Corollary Questions:

1. What do you want students to know and understand?
2. How will you know if they do?
3. What will you do if they do not?
4. What will you do if they do?

Grade 2 Science Curriculum Guide

| Unit 2 | | Natural Resources vs. Man-Made Resources (4 weeks) | | | | | |
|---|--|---|------------------------------|---|---------|--|--|
| Generalizations: | I know that resources can be categorized as natural or man-made. I know that soil can be described and sorted by size, texture, and color. I know that rocks can be described by their size, texture, and color. I know that natural sources of freshwater and saltwater can be compared by their properties. | | | | | | |
| TEKS / Student Expectation: | 2.7C distinguish between natural and manmade resources 1.7A observe, compare, describe, and sort components of soil by size, texture, and color 2.7A observe and describe rocks by size, texture, and color 2.7B identify and compare the properties of natural sources of freshwater and saltwater | | | | | | |
| Formal Assessment: | Grade 5 TAKS: | | | | | | |
| Clarifications: | Students should understand that natural resources are created by nature and man-made resources are created by using natural resources. Natural resources are important parts of environmental systems and if resources such as clean air, soil and clean water are missing, the system will not work well. | | | | | | |
| Notes to Teacher: | *Introduce the concept of natural resources to students. Students should understand that the basic natural resources (water, soil, and air) are used by all living things. This will lead into a discussion of natural resources vs. man-made resources. *When introducing man-made vs. natural resources, explain that man-made resources are natural materials that have been manipulated by people in some way. Use easy to understand examples to demonstrate this. (For example, a desk is wood that has been manipulated, so it is man-made). *Soil texture refers to the size of the particles in the soil sample. *Ideas for the Natural vs. Man-Made Resources Venn-diagram: water bottle with water, dirt, rocks, paper, and pencil | | | | | | |
| Key Academic Vocabulary: | | | | | | | |
| natural resource | recurso natural | man-made resource | recursos hecho por el hombre | texture | textura | | |
| Vertical Alignment: | | | | | | | |
| 1st Grade | | | ← Before After → | 3rd Grade | | | |
| ©1.7B identify and describe a variety of natural sources of water, including streams, lakes, and oceans 1.7C gather evidence of how rocks, soil, and water help to make useful products | | | | ©3.7D explore the characteristics of natural resources that make them useful in products and materials such as clothing and furniture and how resources may be conserved | | | |

Grade 2 Science Curriculum Guide

| Engage | Explore | Explain | Extend | Evaluate |
|---|--|---|--|----------|
| Natural Resources vs. Man-Made Resources (4 weeks) | | | | |
| <p><u>Natural Resources vs. Man-Made Resources:</u> The teacher will place a variety of natural items (rocks, soil, leaves, etc.) in a circle for all learners to see. Question students as to where these items came from. Guide students to the understanding that all of these items came from the earth and are called natural resources.</p> <p>The teacher will add several man-made items to the circle. The teacher will guide learners in a discussion on how the two sets of items are alike and different. The conversation should lead them to categorize the items as either natural or man-made resources.</p> <p>Create a chart organizing objects in their environment as a man-made or natural resource.</p> <p><u>Soil:</u> The teacher will take learners on a walk around the school campus. Point out the many trees/plants seen on the walk. Discuss what makes the plants thrive, making sure to focus on soil as a natural resource needed by plants.</p> <p><u>Rocks:</u> The learner will collect rocks from the school’s grounds. The class will spread their collection of rocks in front of everyone. The teacher will lead a class discussion about the different attributes of their rocks.</p> <p><u>Water:</u> Show and discuss video on water. Teacher will provide two small cups with water (one fresh, one slightly salty) for each student to taste. Discuss the differences and talk about where we might get the different types of water.</p> <hr style="border-top: 1px dashed black;"/> <p>Textbook pgs. C15-C21</p> <p>http://streaming.discoveryeducation.com > Video: <u>A First Look: Water Segments:</u> “Welcome to Earth: The Blue Planet,” “Where is the Earth’s Water?”, and “All Living Things Need Water.”</p> | <p><u>Natural Resources vs. Man-Made Resources:</u> AIMS activity: “Made by Nature and Made by Me!” Textbook “Investigation Challenge: Hands-On Activity: Making Paper” (pg. C16)</p> <p><u>Soils:</u> Introduce three soil types (sand, clay, and topsoil). Explain that the different soils will have different textures (particle size), and color AIMS Activity: “What Makes Soil?” Textbook “Investigation Challenge- Hands-On Activity: What Makes Up Soil?”</p> <p><u>Rocks:</u> Teacher will refer to the Science Net Links we site to continue the rock observations and investigation.</p> <p><u>Water:</u> Create a chart showing freshwater and saltwater sources. Cut out magazine pictures, or draw pictures, of water sources and paste under correct category.</p> <hr style="border-top: 1px dashed black;"/> <p>Textbook pgs. C8, C16 <u>AIMS Under Construction</u> “Made by Nature and Made by Me!” <u>AIMS Overhead and Underfoot</u> “What Makes Soil?” Rock activities: http://www.sciencenetlinks.com/lessons.php?DocID=365 http://www.sciencenetlinks.com/lessons.php?DocID=110</p> | <p>The teacher will gather a variety of natural and man-made resources. The teacher will lead the class into a discussion on where they belong in a Venn diagram (Natural vs. Man-Made Resources). The Venn diagram should be a large Venn diagram on the floor (you can use string or hula-hoops).</p> | <p><u>Natural Resources vs. Man-Made Resources:</u> Foldable – Natural Resources vs. Man-Made Resources</p> <hr style="border-top: 1px dashed black;"/> <p>Workbook pg. WB43</p> | |

Grade 2 Science Curriculum Guide

| Unit 2 | | Weather (3 weeks) | | | | | |
|--|--|-------------------|---------------------|------------------|------------|--|--|
| Generalizations: | I know that weather includes changes in temperature, precipitation, and wind. I know that patterns in weather can be recorded. I know that weather can be different in different locations. | | | | | | |
| TEKS / Student Expectation: | @2.8A measure, record, and graph weather information, including temperature, wind conditions, precipitation, and cloud coverage, in order to identify patterns in the data 3.8A observe, measure, record, and compare day-to-day weather changes in different locations at the same time that include air temperature, wind direction, and precipitation | | | | | | |
| Formal Assessment: | Grade 2 DCAs: 2.8A; Grade 5 TAKS: | | | | | | |
| Clarifications: | Within the natural environment, students will observe the properties of earth materials as well as predictable patterns that occur on Earth and in the sky. The students understand that those patterns are used to make choices in clothing, activities, and transportation. (TEKS §112.13) | | | | | | |
| Notes to Teacher: | * Daily weather observations should be ongoing throughout the unit. * The teacher should review seasons, focusing on months in which the seasons occur, clothing, and general climate. *Bilingual – <i>Tiempo</i> is the science term accepted to refer to weather. In 5 th grade, the word <i>clima</i> will be used to describe climate, not weather. | | | | | | |
| Key Academic Vocabulary: | | | | | | | |
| weather | tiempo | precipitation | precipitación | thermometer | termómetro | | |
| temperature | temperatura | weather vane | veleta del tiempo | | | | |
| Vertical Alignment: | | | | | | | |
| 1st Grade | | | ← Before After → | 3rd Grade | | | |
| 1.8A record weather information, including relative temperature, such as hot or cold, clear or cloudy, calm or windy, and rainy or icy 1.8D demonstrate that air is all around us and observe that wind is moving air | | | | | | | |

Grade 2 Science Curriculum Guide

| Engage | Explore | Explain | Extend | Evaluate |
|---|--|--|--------|----------|
| Weather (3 weeks) | | | | |
| <p>Ask the students to describe the coldest and hottest day they can remember and what the weather was like on those days.</p> <p>Question the students on where they would find the coldest place on Earth and the hottest place in the United States.</p> <p>Show a picture of the coldest and windiest place on Earth (Antarctica) and hottest place in the United States (Death Valley). Have the students tell you which location is the coldest and which is the hottest and why.</p> <p>Ask the learners to describe today’s weather. Have them look around the room and discuss how their classmates’ clothing reflects the weather. What other things in the classroom reminds them of what the weather is like outside?</p> | <p>Learners will observe a weather map and temperature listings and discuss the patterns they notice across the U.S. Teacher will use National Geographic Xpeditions –“How’s the Weather Today?” as a lesson plan guide.</p> <p>Learners will begin charting daily weather to identify patterns in data (see Weather Observation Table) or use AIMS Primarily Earth – “Watching the Weather”</p> <p>Learners will investigate air temperature, wind, and clouds and how they relate to weather. <u>AIMS Primarily Physics</u> – “What is Temperature?”/Textbook pgs. D46-D47 <u>AIMS Primarily Earth</u> – “The Wind Blows” <u>AIMS Primarily Earth</u> – “Cloudy Weather”/Textbook pgs. D48-D49 The teacher will review the seasons (see Teacher Notes).</p> | <p>Learners will draw pictures of themselves in their hometown and in another town with different weather.</p> <p>Animals and Weather: learners can use the Internet to find out about some of the animals that are unique to certain climates in the U.S. (For example, the grizzly bear lives in northern climates, a flamingo lives in a warmer, southern climate). Learners will draw pictures of these animals in the appropriate locations on a blank outline map of the U.S. or on blank paper.</p> <p>Foldable (Wind, Clouds): Have students create a foldable, drawing pictures of a flag to illustrate no wind, a breeze, wind, and strong wind.</p> <p>Assessment: Present magazine or other pictures of weather and have students indicate type of weather for their pictures.</p> | | |
| <p>Textbook pgs. D32-D33 <u>National Geographic Xpeditions: “How’s the Weather Today?”</u> http://www.nationalgeographic.com/xpeditions/lessons/07/gk2/weathertoday.html</p> | <p><u>National Geographic Xpeditions: “How’s the Weather Today?”</u> http://www.nationalgeographic.com/xpeditions/lessons/07/gk2/weathertoday.html <u>AIMS Primarily Earth</u> – “Watching the Weather” <u>AIMS Primarily Physics</u> – “What is Temperature?” <u>AIMS Primarily Earth</u> – “The Wind Blows” <u>AIMS Primarily Earth</u> – “Cloudy Weather” http://streaming.discoveryeducation.com > Video: <u>A First Look: Weather</u> Segment: “The Weather is Different from Day to Day and from Place to Place” (1:39) Textbook pgs. D35, D46-D49. Alief. Elem Science Web Site > Professional Resources > Lesson Resources > “Weather Observation Table,” “Weather Observation Table - Spanish”</p> | <p>National Geographic Xpeditions: How’s the Weather Today? (Extending the Lesson)- http://www.nationalgeographic.com/xpeditions/lessons/07/gk2/weathertoday.html</p> | | |

Grade 2 Science Curriculum Guide

| Unit 2 | | The Water Cycle (4 weeks) | | | | | |
|------------------------------------|--|----------------------------------|---------------------|---|--------------|---------------|---------------|
| Generalizations: | I know that the water cycle is a system driven by energy from the sun. I know that water travels in a continuous cycle (as it evaporates from the earth’s surface and living organisms, condenses in the cool atmosphere, and falls back to earth as precipitation). | | | | | | |
| TEKS / Student Expectation: | @2.8C explore the processes in the water cycle, including evaporation, condensation, and precipitation, as connected to weather conditions | | | | | | |
| Formal Assessment: | Grade 2 DCAs: 2.8C; Grade 5 TAKS: | | | | | | |
| Clarifications: | The student knows that there are recognizable patterns in the natural world and among objects in the sky. (TEKS §112.13) | | | | | | |
| Notes to Teacher: | <ul style="list-style-type: none"> * Water Cycle is not a focus in 1st grade. * The “Moving Water” demo will bridge the gap between the concrete, real-life experiences of boiling water in the kitchen to the more abstract concept of the “water cycle”. * Teacher should make sure to emphasize that the sun is the driving force behind the water cycle. * Students should understand that the hot plate actually represents the sun. Teachers may want to also add a heat lamp as a more accurate representation of the sun, however, the hot plate is still needed for this demo to be successful. | | | | | | |
| Key Academic Vocabulary: | | | | | | | |
| water cycle | ciclo del agua | evaporation | evaporación | condensation | condensación | precipitation | precipitación |
| runoff | escurrimiento | accumulation | acumulación | | | | |
| Vertical Alignment: | | | | | | | |
| 1st Grade | | | ← Before After → | 4th Grade | | | |
| | | | | @4.8B describe and illustrate the continuous movement of water above and on the surface of Earth through the water cycle and explain the role of the Sun as a major source of energy in this process | | | |

Grade 2 Science Curriculum Guide

| Engage | Explore | Explain | Extend | Evaluate |
|--|---|---|---|---|
| The Water Cycle (4 weeks) | | | | |
| <p>Ask children to think about rain puddles. Discuss what happens to the water as the puddle dries up.</p> | <p>Learners will view the Study Jams video and complete Water Cycle Wheel activity to learn the parts of the water cycle.</p> <p>Teacher will use the Scholastic Study Jams Lesson: Water Cycle Wheel as a lesson plan guide.</p> <p>TEACHER DEMO – AIMS Water Precious Water – “Moving Water”</p> <p>Learners will investigate the parts of the water cycle through investigations.</p> <p><u>AIMS Primarily Earth</u> “What Makes Rain?”</p> <p><u>AIMS Primarily Earth</u> “A Disappearing Act”</p> <p><u>AIMS Primarily Earth</u> “Water to Ice to Water”</p> | <p>The learner will use student workbook to complete “What is the Water Cycle” Worksheet.</p> | <p>Show and discuss video.</p> <p>The learner will act out the journey of a rain drop.</p> | <p>Have students create a visual of the water cycle, making sure to label all parts of the water cycle.</p> |
| | <p>Textbook pgs. D41-D43</p> <p>Scholastic Study James Video; The Water Cycle: http://teacher.scholastic.com/activities/studyjams/water_cycle/index.htm</p> <p>Scholastic Lesson Plan: Water Cycle Wheel: http://www2.scholastic.com/browse/lessonplan.jsp?id=1075</p> <p><u>AIMS Primarily Earth</u> “What Makes Rain?”</p> | <p>Student Workbook pg. WB64</p> <p>Textbook pgs. D41-D43</p> | <p>http://streaming.discoveryeducation.com</p> <p>> Video: <u>The Magic School Bus: Wet All Over</u></p> | |



Unit 3: Matter and Energy

This curriculum guide was created as a resource for teaching science on a daily basis. This guide provides background and information for the unit and curriculum pages for each concept to provide suggested resources and timeline. It is expected that at least 60% of science be hands-on/minds-on active investigations that include quality interaction between and among students and teacher. Interactions should include reading, writing, listening, and speaking.

Student understandings will be assessed by the District Common Assessments (DCAs) which are based on the **generalization statements** in this guide.

This guide can be modified as needed within this unit to ensure students' success. These modifications would include those necessary to incorporate reteaching or for acceleration when students already own a concept. Additional resources that are available may be used providing they are aligned to the generalizations.

Critical Corollary Questions:

1. What do you want students to know and understand?
2. How will you know if they do?
3. What will you do if they do not?
4. What will you do if they do?

Grade 2 Science Curriculum Guide

| Unit 3 | | | | | | | |
|---|---|-----------------|-----------------|---------------------|---|---------|----------|
| Physical Properties of Matter (3 weeks) | | | | | | | |
| Generalizations: | I know that objects can be sorted by their properties. | | | | | | |
| TEKS / Student Expectation: | <p>Ⓢ2.5A classify matter by physical properties, including shape, relative mass, relative temperature, texture, flexibility, and whether material is a solid or liquid</p> <p>2.5C demonstrate that things can be done to materials to change their physical properties such as cutting, folding, sanding, and melting</p> <p>2.5D combine materials that when put together can do things that they cannot do by themselves such as building a tower or a bridge and justify the selection of those materials based on their physical properties</p> | | | | | | |
| Formal Assessment: | Grade 2 DCAs: 2.5A; Grade 5 TAKS: | | | | | | |
| Clarifications: | Within the physical environment, students expand their understanding of the properties of objects such as shape, mass, temperature, and flexibility then use those properties to compare, classify, and then combine the objects to do something that they could not do before. (TEKS §112.13) | | | | | | |
| Notes to Teacher: | <p>*The students will be comparing the amount of something in one container with the amount of something in another container; however, the concept of volume will be explored in detail in 3rd grade.</p> <p>*Some properties that objects can be sorted by: shape, relative mass, relative temperature, texture, flexibility, and whether material is a solid or liquid.</p> | | | | | | |
| Key Academic Vocabulary: | | | | | | | |
| matter | materia | temperature | temperatura | shape | forma | solids | sólidos |
| mass | masa | texture | textura | flexibility | flexibilidad | liquids | líquidos |
| properties | propiedades | characteristics | características | length | longitud | | |
| Vertical Alignment: | | | | | | | |
| 1st Grade | | | | ← Before After → | 3rd Grade | | |
| Ⓢ1.5A classify objects by observable properties of the materials from which they are made such as larger and smaller, heavier and lighter, shape, color, and texture | | | | | <p>Ⓢ3.5B describe and classify samples of matter as solids, liquids, and gases and demonstrate that solids have a definite shape and that liquids and gases take the shape of their container</p> <p>3.5A measure, test, and record physical properties of matter, including temperature, mass, magnetism, and the ability to sink or float</p> <p>3.5C predict, observe, and record changes in the state of matter caused by heating or cooling</p> | | |

Grade 2 Science Curriculum Guide

| Engage | Explore | Explain | Extend | Evaluate |
|---|--|---|---|----------|
| Physical Properties of Matter (3 weeks) | | | | |
| <p>Show and discuss video segment “Five Senses.”</p> <p>Introduce matter and discuss how matter is everything that has mass and takes up space.</p> <p>Show examples of different materials. “Is this matter?” Explain that not all matter looks the same. Describe a solid, liquid, and gas. Chart the characteristics of each. Students write examples of liquids, solids, and gases in their journals.</p> | <p>Show and discuss the video segments: “Identifying Properties of Matter” and “Matter Can.”</p> <p>Exploring physical properties of matter: The teacher models how to describe objects based on physical properties such as hardness, color, smell, shape, mass, texture, flexibility, and state of matter.</p> <p>In small groups, students describe or sort objects according to their physical properties.</p> <p>Measuring & Comparing Length: Students participate in two contests from Bridging II TAKS to discover that the use of standardized units is important to measure fairly. Read and discuss <u>Super Sand Castle Saturday</u> to reinforce the concept. Use Bridging II TAKS resource.</p> <p>Measuring & Comparing Mass: Use Bridging II TAKS Resource.</p> <p>Measuring & Comparing Temperature: Use Bridging II TAKS Resource.</p> | <p>Bridging II TAKS Problem Solving Activities number 1 and number 3.</p> | <p>Bridging II TAKS review questions.</p> | |
| <p>http://streaming.discoveryeducation.com > Video: <u>Properties of Matter Part 1</u> Segment: “Five Senses”</p> | <p>> Video: <u>Properties of Matter Part 1</u> Segments: “Identifying Properties of Matter,” and “Matter Can” <u>Super Sand Castle Saturday</u> by Stuart Murphy Length: <u>Bridging II TAKS</u> pgs. 3-7 and pgs. 8-9 Mass: <u>Bridging II TAKS</u> pg. 22 Steps 1-3 Temperature: <u>Bridging II TAKS</u> pgs. 30</p> | <p><u>Bridging II TAKS</u> pg. 33, backline masters L & M</p> | <p><u>Bridging II TAKS</u> pg. 36 -37</p> | |

Grade 2 Science Curriculum Guide

| Unit 3 | | Changes in Matter (2 weeks) | | | | | |
|---|---|-----------------------------|---------------------|---|-------------|-----------------|--------------------|
| Generalizations: | I know that heat can melt a solid into a liquid and can cause a liquid to evaporate into a gas. I know that properties of matter can be changed by cutting, folding, sanding and melting. | | | | | | |
| TEKS / Student Expectation: | Ⓜ2.5B compare changes in materials caused by heating and cooling 2.5C demonstrate that things can be done to materials to change their physical properties such as cutting, folding, sanding, and melting 2.6A Investigate the effects on an object by increasing or decreasing amounts of light, heat, and sound energy such as how the color of an object appears different in dimmer light or how heat melts butter | | | | | | |
| Formal Assessment: | Grade 2 DCAs: 2.5B; Grade 5 TAKS: | | | | | | |
| Clarifications: | The student knows that matter has physical properties and those properties determine how it is described, classified, changed, and used. (TEKS §112.13) | | | | | | |
| Notes to Teacher: | | | | | | | |
| Key Academic Vocabulary: | | | | | | | |
| changes | cambios | freeze | congelar | temperature | temperatura | thermometer | termómetro |
| melt | derretir | mass | masa | heat | calor | state of matter | estados de materia |
| Vertical Alignment: | | | | | | | |
| 1st Grade | | | ← Before After → | 3rd Grade | | | |
| Ⓜ1.5B predict and identify changes in materials caused by heating and cooling such as ice melting, water freezing, and water evaporating | | | | 3.5C predict, observe, and record changes in the state of matter caused by heating or cooling | | | |

Grade 2 Science Curriculum Guide

| Engage | Explore | Explain | Extend | Evaluate |
|---|--|---|--|----------|
| Changes in Matter (2 weeks) | | | | |
| <p>Show the class a piece of construction paper and have the students describe it using the physical properties they have learned. Ask students to think of ways to change the paper’s physical properties.</p> | <p>Fold a piece of paper to change its shape. Then cut the paper to change its size. Put the paper that has been folded and cut onto one side of a pan balance. Place an unchanged piece of paper in the other side. Compare the mass. Discuss how cutting changed the mass of the paper.</p> <p>Brainstorm about other materials that could be changed by cutting and/or folding. Reinforce the fact that, by changing the material’s shape and mass, we are changing its physical properties.</p> <p>Review safety rules for scissors. Provide students with scissors, sand paper, and different objects. The learners will explore ways to change properties of the objects. They will record the properties that they were able to change by cutting, folding, or sanding, including before and after pictures.</p> <p>Remind the learners about how we compared the temperature of water in different cups. Show The Blue Dragon and discuss how heat can causes changes in matter.</p> <p>Demonstration: Teacher changes ice cubes from solid to liquid to gas. Discuss.</p> | <p>Use Bridging II TAKS resource to give the learners the opportunity to investigate how heat changes matter.</p> | <p>The teacher will present the learners with images of different types of matter in different states. The learners will explain how to change the states of matter represented in each image.</p> | |
| | <p>http://streaming.discoveryeducation.com > Video: The Blue Dragon: Changing Things Segment: “Heat Changes Things” Textbook pgs. E40-E43</p> | | <p>Bridging II TAKS pgs. 31-32</p> | |



Unit 4: Force, Motion, and Energy

This curriculum guide was created as a resource for teaching science on a daily basis. This guide provides background and information for the unit and curriculum pages for each concept to provide suggested resources and timeline. It is expected that at least 60% of science be hands-on/minds-on active investigations that include quality interaction between and among students and teacher. Interactions should include reading, writing, listening, and speaking.

Student understandings will be assessed by the District Common Assessments (DCAs) which are based on the **generalization statements** in this guide.

This guide can be modified as needed within this unit to ensure students' success. These modifications would include those necessary to incorporate reteaching or for acceleration when students already own a concept. Additional resources that are available may be used providing they are aligned to the generalizations.

Critical Corollary Questions:

1. What do you want students to know and understand?
2. How will you know if they do?
3. What will you do if they do not?
4. What will you do if they do?

Grade 2 Science Curriculum Guide

| Unit 4 | | Magnetism (2 weeks) | | | | | |
|--|--|----------------------------|-----------|---------------------|---|--|--|
| Generalizations: | I know that certain materials are attracted to magnets while others are not. I know that magnets are used in everyday life. | | | | | | |
| TEKS / Student Expectation: | @2.6B observe and identify how magnets are used in everyday life K.6B explore interactions between magnets and various materials 1.6B predict and describe how a magnet can be used to push or pull an object | | | | | | |
| Formal Assessment: | Grade 2 DCAs: 2.6B; Grade 5 TAKS: | | | | | | |
| Clarifications: | The student knows that forces cause change, and energy exists in many forms. (TEKS §112.13) | | | | | | |
| Notes to Teacher: | | | | | | | |
| Key Academic Vocabulary: | | | | | | | |
| magnet | imán | magnetic | magnético | repel | repeler | | |
| magnetism | magnetismo | attract | atraer | metal | metal | | |
| Vertical Alignment: | | | | | | | |
| 1st Grade | | | | ← Before After → | 3rd Grade | | |
| 1.6B predict and describe how a magnet can be used to push or pull an object | | | | | 3.6C observe forces such as magnetism and gravity acting on objects | | |

Grade 2 Science Curriculum Guide

| Engage | Explore | Explain | Extend | Evaluate |
|--|---|---|--------|----------|
| Magnetism (2 weeks) | | | | |
| <p>Demonstration: “The Flying Paperclip” from Bridging II TAKS resource.</p> | <p>Activity: “Stick to It!”</p> <p>After completing pg. 34, work with the learners to complete a table that is labeled “magnetic” and “non-magnetic.” The class will categorize the objects they tested into the table.</p> <p>Guide a discussion of what the magnetic items have in common and what the non-magnetic items have in common. As the discussion progresses, work with the students to create generalizations about magnetic materials, such as “Materials made of plastic are not magnetic.”</p> <p>Activity: “Push or Pull?”</p> <p>Activity: “Which Magnet is the Strongest?”</p> | <p>Activity: “Pick Up Clips”</p> <p>As a review, show the video A First Look: Magnets. The learners will take notes on key concepts and vocabulary as they watch.</p> <p>Discuss uses of magnets in everyday life. The learners will illustrate different uses of magnets in everyday life, including captions that describe what is happening.</p> | | |
| <p>3rd Grade Bridging II TAKS pg. 27</p> | <p>3rd Grade Bridging II TAKS pgs. 28, 33-34 “Stick to it!”</p> <p>3rd Grade Bridging II TAKS pgs. 29, 35 “Push or Pull?”</p> <p>3rd Grade Bridging II TAKS pgs. 30-31, 27 “Which Magnet is the Strongest?”</p> | <p>3rd Grade Bridging II TAKS pgs. 30, 36 “Pick Up Clips”</p> <p>http://streaming.discoveryeducation.com</p> <p>> Video: A First Look: Magnets Show all segments except: “How to Make a Magnet,” and “Electromagnets: Using Electricity and Magnets Together.”</p> | | |

Grade 2 Science Curriculum Guide

| Unit 4 | | Forces & Motion (1 Week) | | | | | |
|---|---|--------------------------|---------------------|--|----------|------|-------|
| Generalizations: | I know that objects can change position when a force is applied to them. I know that a force can cause an object to start moving, stop moving, or change direction. | | | | | | |
| TEKS / Student Expectation: | 2.6C trace the changes in the position of an object over time such as a cup rolling on the floor and a car rolling down a ramp 2.6D compare patterns of movement of objects such as sliding, rolling, and spinning | | | | | | |
| Formal Assessment: | Grade 5 TAKS: | | | | | | |
| Clarifications: | Students manipulate objects to demonstrate a change in motion and position. (TEKS §112.13) | | | | | | |
| Notes to Teacher: | | | | | | | |
| Key Academic Vocabulary: | | | | | | | |
| push | empujar | position | posición | slide | deslizar | spin | girar |
| pull | halar/jalar | motion | movimiento | roll | rodar | | |
| Vertical Alignment: | | | | | | | |
| 1st Grade | | | ← Before After → | 3rd Grade | | | |
| ©1.6D demonstrate and record the ways that objects can move such as in a straight line, zig-zag, up and down, back and forth, round and round, and fast and slow 1.6B predict and describe how a magnet can be used to push or pull an object 1.6C describe the change in the location of an object such as closer to, nearer to, and farther from | | | | ©3.6B demonstrate and observe how position and motion can be changed by pushing and pulling objects to show work being done such as swings, balls, pulleys, and wagons 3.6C observe forces such as magnetism and gravity acting on objects | | | |

Grade 2 Science Curriculum Guide

| Engage | Explore | Explain | Extend | Evaluate |
|--|--|---|--------|----------|
| Forces & Motion (1 Week) | | | | |
| <p>In cooperative groups, students conduct the investigation “Pushes and Pulls” from the textbook. Students record their findings and share.</p> | <p>Start a RAN chart with students’ prior knowledge. Manipulate and complete the chart as lessons for this concept are completed.</p> <p>The teacher guides the exploratory reading “Forces” from the textbook, adding to the RAN chart as necessary. Discuss new information.</p> <p>Demonstration: Show pushing and pulling by using a rolling chair. Use toy cars to demonstrate that forces can cause objects to start moving, stop moving, or change directions.</p> <p>Exploring Motion: In cooperative groups, students conduct the investigation “One Way to Measure Motion” from the textbook. Discuss findings. The teacher traces the position of the toy car over time, creating a visual representation of the motion.</p> <p>Exploring the Relationship Between Force and Motion: In cooperative groups, students conduct an investigation using <u>Bridging II TAKS</u> resource. Reinforce this concept by reading “Force and Motion” from the textbook.</p> | <p>Other Types of Motion: In cooperative groups students predict, observe, record, and explain the motion of objects that slide, roll, and spin.</p> <p>The teacher creates visual representations that trace the motion of the objects over time. Label the diagram to describe slides, rolls and spins.</p> <p>Students complete assessment from textbook.</p> <p>Go back to RAN chart to add confirmations and correct misconceptions. Discuss.</p> | | |
| Textbook pg. F4 | Forces: Textbook. pgs. F5-F9 Relationship Between Force and Motion: <u>Bridging II TAKS</u> pg. 14. Steps 1, 2, and 3; and pg. 15. Steps 1 and 2. Force and Motion: Textbook pgs. F12-F13 | Textbook pgs. F18-F19 | | |

Grade 2 Science Curriculum Guide

| Unit 4 | | Sound (1 week) | | | | | |
|------------------------------------|---|----------------|------------|---------------------|---|-------|------|
| Generalizations: | I know that sound is caused by vibrations. I know that increasing or decreasing sound energy will result in different levels of loudness. | | | | | | |
| TEKS / Student Expectation: | 2.6A Investigate the effects on an object by increasing or decreasing amounts of light, heat, and sound energy such as how the color of an object appears different in dimmer light or how heat melts butter | | | | | | |
| Formal Assessment: | Grade 5 TAKS: | | | | | | |
| Clarifications: | The student knows that forces cause change, and energy exists in many forms (TEKS §112.13) | | | | | | |
| Notes to Teacher: | *The heat and sound aspects of TEKS 2.6A will be covered in other 2nd/3rd grade units and concepts. Changes in heat were addressed in the 2nd Grade Matter & Energy unit. Changes in light will be covered in the 3rd Grade Forces, Motion & Energy unit. | | | | | | |
| Key Academic Vocabulary: | | | | | | | |
| vibration | vibración | loudness | intensidad | sound | sonido | pitch | tono |
| Vertical Alignment: | | | | | | | |
| 1st Grade | | | | ← Before After → | 3rd Grade | | |
| | | | | | ©3.6A explore different forms of energy, including mechanical, light, sound, and heat/thermal in everyday life | | |

Grade 2 Science Curriculum Guide

| Engage | Explore | Explain | Extend | Evaluate |
|--|--|---------|--|---|
| Forces & Motion (1 Week) | | | | |
| <p>Show <u>A First Look at Sound</u> video, pausing throughout to discuss the demonstrations and vocabulary provided in the video. Chart vocabulary and new learning.</p> | <p>Discover that sound is caused by vibration by following Lesson 1 from the NSRC resource.</p> <p>Exploring Sound: Lesson 3 from the NSRC resource.</p> | | <p>Exploring Pitch: Lesson 4 & 5 from the NSRC resource.</p> | <p>The learners will work to complete the activities in the textbook review. The learners will write about, or explain, the sound concepts that relate to each section of the review.</p> |
| <p>http://streaming.discoveryeducation.com > Video: <u>A First Look at Sound</u> <u>NSRC Sound Teacher’s Guide</u> “Lesson 1: Thinking About Sound”</p> | <p>Textbook pgs. F23-F43</p> <p><u>NSRC Sound Teacher’s Guide</u> “Lesson 3: Making Sounds with Nails”</p> | | <p><u>NSRC Sound Teacher’s Guide</u> “Lesson 4: Making Sounds with Rulers” and “Lesson 5: Exploring Pitch”</p> | <p>Textbook pgs. F44-F45</p> |



Unit 5: Organisms and Environments

This curriculum guide was created as a resource for teaching science on a daily basis. This guide provides background and information for the unit and curriculum pages for each concept to provide suggested resources and timeline. It is expected that at least 60% of science be hands-on/minds-on active investigations that include quality interaction between and among students and teacher. Interactions should include reading, writing, listening, and speaking.

Student understandings will be assessed by the District Common Assessments (DCA) which are based on the **generalization statements** in this guide.

This guide can be modified as needed within this unit to ensure students' success. These modifications would include those necessary to incorporate reteaching or for acceleration when students already own a concept. Additional resources that are available may be used providing they are aligned to the generalizations.

Critical Corollary Questions:

1. What do you want students to know and understand?
2. How will you know if they do?
3. What will you do if they do not?
4. What will you do if they do?

Grade 2 Science Curriculum Guide

| Unit 5 Physical Characteristics of Plants (2 weeks) | | | | | | | |
|---|----------|---|---------------------|--|-------|--------|----------|
| Generalizations: | | I know that plants and animals have characteristics that help them meet their basic needs | | | | | |
| TEKS / Student Expectation: | | 2.9A identify the basic needs of plants and animals @2.10B observe, record, and compare how the physical characteristics of plants help them meet their basic needs such as stems carry water throughout the plant | | | | | |
| Formal Assessment: | | Grade 2 DCAs: 2.10B; Grade 5 TAKS: | | | | | |
| Clarifications: | | Within the living environment, students explore patterns, systems, and cycles by investigating characteristics of organisms, life cycles, and interactions among all the components within their habitat. Students examine how living organisms depend on each other and on their environment. (TEKS §112.13) | | | | | |
| Notes to Teacher: | | *For the AIMS activity “Stem Study,” ask the learners to bring carnations or celery stalks to class. They will not be provided by the Science Center. | | | | | |
| Key Academic Vocabulary: | | | | | | | |
| seed | semilla | roots | raíces | leaf | hojas | absorb | absorber |
| seedling | plántula | stem | tallo | flower | flor | | |
| Vertical Alignment: | | | | | | | |
| 1st Grade | | | ← Before After → | 3rd Grade | | | |
| 1.10B identify and compare the parts of plants | | | | 3.10A explore how structures and functions of plants and animals allow them to survive in a particular environment | | | |

Grade 2 Science Curriculum Guide

| Engage | Explore | Explain | Extend | Evaluate |
|---|--|--|---|----------|
| Physical Characteristics of Plants (2 weeks) | | | | |
| <p>Take the students outside for a nature walk. The learners will take their journals with them to make note of the living things and non-living things that they encountered.</p> <p>Ask the learners to share some of the living things that they saw outside. Discuss and chart the basic needs of animals and plants.</p> | <p>Exploring Seeds: Use textbook resource to discuss how seeds meet the basic needs of a seedling. The learners will take seeds, open them, and journal their observations.</p> <p>Exploring Roots: Use “Root Study” to explore and discuss the role roots play in plant survival.</p> <p>Exploring Stems: Use “Stem Study” to demonstrate how stems work, and their role in helping the plant survive.</p> <p>Exploring Leaves: Use “Observe a Leaf” to recognize the physical characteristics of a leaf that allow it to take in energy from the sun. Discuss how plants create their own food.</p> <p>Discuss the role flowers play in the life cycle of a plant.</p> | <p>The class will use the summary of plant parts in the AIMS resource to launch a discussion of how the parts of a plant work together as a system to help plants survive.</p> | <p>The learners will create a foldable that includes a diagram of a plant, a label for each part of the plant, and an explanation of how each part helps the plant survive.</p> | |
| <p><u>AIMS Primarily Plants</u> “Observe a Leaf,” “Stem Study,” and “Root Study” Textbook pgs. A9-A11</p> | | <p><u>AIMS Primarily Plants</u> “Plant Parts”</p> | | |

Grade 2 Science Curriculum Guide

| Unit 5 | Adaptations for Survival (2 weeks) |
|------------------------------------|--|
| Generalizations: | I know that the behavior and growth of living things can be affected by factors in their environment. I know that the physical characteristics and behaviors of animals help them meet their needs. |
| TEKS / Student Expectation: | 2.10A observe, record, and compare how the physical characteristics and behaviors of animals help them meet their basic needs such as fins help fish move and balance in the water @2.9B identify factors in the environment, including temperature and precipitation, that affect growth and behavior such as migration, hibernation, and dormancy of living things |
| Formal Assessment: | Grade 2 DCAs: 2.9B; Grade 5 TAKS: |
| Clarifications: | Within the living environment, students explore patterns, systems, and cycles by investigating characteristics of organisms, life cycles, and interactions among all the components within their habitat. Students examine how living organisms depend on each other and on their environment. (TEKS §112.13) |
| Notes to Teacher: | |

Grade 2 Science Curriculum Guide

| Key Academic Vocabulary: | | | | | | | |
|--------------------------|----------------|-------------|---------------|-----------|-----------|----------|----------|
| adaptation | adaptación | survival | supervivencia | migration | migración | dormancy | latencia |
| characteristic | característica | hibernation | hibernación | | | | |

| Vertical Alignment: | | | | |
|--|---------------------|--|--------|----------|
| 1st Grade | ← Before After → | 3rd Grade | | |
| <p>Ⓢ1.10A investigate how the external characteristics of an animal are related to where it lives, how it moves, and what it eats</p> | | <p>3.10A explore how structures and functions of plants and animals allow them to survive in a particular environment 3.10B explore that some characteristics of organisms are inherited such as the number of limbs on an animal or flower color and recognize that some behaviors are learned in response to living in a certain environment such as animals using tools to get food</p> | | |
| | | 4th Grade | | |
| | | <p>Ⓢ4.10A explore how adaptations enable organisms to survive in their environment such as comparing birds' beaks and leaves on plants</p> | | |
| Engage | Explore | Explain | Extend | Evaluate |

Adaptations for Survival (2 weeks)

***Living specimens:** In this unit, we will be raising caterpillars and butterflies and observing them to demonstrate key concepts such as physical adaptations and life cycles. As soon as the caterpillars arrive, prepare their food cups and discuss proper care and basic needs of the caterpillars (NSRC The Life Cycle of Butterflies “Lesson 2: Caring for Caterpillars” and “Lesson 3: Learning More about Caterpillars.”)

Lead the class on a discussion and exploration of caterpillar adaptations (NSRC The Life Cycle of Butterflies “Lesson 4: Observing the Caterpillars” and “Lesson 5: Observing Change: Growth and Molting”)

As the caterpillars progress through their life cycles, the learners should periodically create journal entries which describe and illustrate changes in growth. These journal entries will be utilized during the Life Cycle concept later in this unit.

Grade 2 Science Curriculum Guide

| Engage | Explore | Explain | Extend | Evaluate |
|--|--|---|---|----------|
| Adaptations for Survival (2 weeks) | | | | |
| <p>Remind the learners of how we studied plants. Show a picture of a cactus. Explain that the cactus is a plant that has to meet its basic needs just like any other plant. Describe the climate and environment in which cacti usually thrive. Ask the learners how they think the cactus gets enough water to survive. Explain that cacti have developed parts that help them to use water efficiently and store water for use when needed.</p> <p>The teacher will explain that, just like the cactus, other plants and animals have adapted characteristics that will help them survive.</p> | <p>Find research resources (library books, trade books, magazine articles, pictures, videos) that discuss and demonstrate adaptations that help animals survive in their environment.</p> <p>Work with the learners to follow language arts guidelines for research as they investigate adaptations for the following:</p> <ul style="list-style-type: none"> *protection/safety *nutrition/eating *movement *respiration <p>Create a triple Venn diagram to sort organisms by how they move (walk, fly, or swim).</p> | <p>Discuss how migration, hibernation, and dormancy help animals survive when conditions in the environment change.</p> | <p>Activity: What Animal is Better Suited to Survive?</p> <p>Provide diagrams of different environments that leave out some of their inhabitants. Provide picture cards of the missing inhabitants. Ask the learners to determine which organisms would be best adapted to live in each environment. The learners should explain why each organism is well adapted or not well adapted to a particular environment.</p> | |
| | <p>http://streaming.discoveryeducation.com > Video: <u>Animal Features and Their Functions</u> http://streaming.discoveryeducation.com > Video: <u>Adaptations for Survival in the Sea</u></p> | <p>Books on migration, hibernation, and dormancy.</p> | | |

Grade 2 Science Curriculum Guide

| Unit 5 | | Life Cycles (2 weeks) | | | | | |
|--|---------------|---|---------------------|---|--------------------------|-----------|-----------|
| Generalizations: | | I know that the life cycle of an insect includes several unique stages as it grows and develops. | | | | | |
| TEKS / Student Expectation: | | Ⓣ2.10C investigate and record some of the unique stages that insects undergo during their life cycle | | | | | |
| Formal Assessment: | | Grade 2 DCAs: 2.10C; Grade 5 TAKS: | | | | | |
| Clarifications: | | Within the living environment, students explore patterns, systems, and cycles by investigating characteristics of organisms, life cycles, and interactions among all the components within their habitat. Students examine how living organisms depend on each other and on their environment. (TEKS §112.13) | | | | | |
| Notes to Teacher: | | | | | | | |
| Key Academic Vocabulary: | | | | | | | |
| life cycle | ciclo de vida | metamorphosis | metamorfosis | proboscis | probóscide | | |
| egg | huevo | larva | larva | pupa | pupa | chrysalis | crisálida |
| molting | mudando | spinning | girando | emerging | saliendo/ apareciendo | adult | adulto |
| Vertical Alignment: | | | | | | | |
| 1st Grade | | | ← Before After → | 3rd Grade | | | |
| 1.10D observe and record life cycles of animals such as a chicken, frog, or fish | | | | 3.10C investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs, and lady bugs | | | |

Grade 2 Science Curriculum Guide

| Engage | Explore | Explain | Extend | Evaluate |
|---|--|--|--|----------|
| Life Cycles (2 weeks) | | | | |
| <p>*Living specimens: The caterpillars should be progressing through the stages of their metamorphosis. The learners will observe the caterpillars in each stage to note observations of changes, how the caterpillars/butterflies meet their own needs, and any adaptations that they notice. Lead the class on a discussion and exploration of caterpillar adaptations (NSRC The Life Cycle of Butterflies “Lesson 7: From Caterpillar to Chrysalis,” “Lesson 8: Observing the Chrysalis,” “Lesson 9: The Butterfly Emerges,” “Lesson 10: Feeding the Butterflies.”)</p> <p>As the caterpillars progress through their life cycles, the learners should periodically create journal entries which describe and illustrate changes in growth. These journal entries will be utilized during the Life Cycle concept later in this unit.</p> | | | | |
| <p>The teacher will ask the learners to take out their journal notes that include their observations of the growth of our caterpillars. Ask the learners to retell the events in sequence.</p> <p>The teacher will create a diagram representing the stages in the caterpillar’s life cycle up to this point.</p> | <p>Use NSRC The Life Cycle of Butterflies to investigate caterpillar metamorphosis.</p> | <p>Use the textbook resource to extend the students’ understanding of life cycles to organisms beyond insects.</p> | <p>The learners will create a diagram and write to describe the life cycle of an organism of their choosing.</p> | |
| | <p>NSRC The Life Cycle of Butterflies “Lesson 7: From Caterpillar to Chrysalis,” “Lesson 8: Observing the Chrysalis,” “Lesson 9: The Butterfly Emerges,”</p> | <p>Textbook pgs. A31-A35</p> | <p>Textbook pg. A72</p> | |

Grade 2 Science Curriculum Guide

| Unit 5 | | Interdependence (1 week) | | | | | |
|---|---|--------------------------|---------------------|--|--------------------------|----------------|-------------------|
| Generalizations: | I know that organisms depend on each other and on their environments to survive. | | | | | | |
| TEKS / Student Expectation: | <p>@2.9C compare and give examples of the ways living organisms depend on each other and on their environments such as food chains within a garden, park, beach, lake, and wooded area</p> <p>1.9C gather evidence of interdependence among living organisms such as energy transfer through food chains and animals using plants for shelter</p> <p>2.9A identify the basic needs of plants and animals</p> | | | | | | |
| Formal Assessment: | Grade 2 DCAs: 2.9C; Grade 5 TAKS: | | | | | | |
| Clarifications: | Within the living environment, students explore patterns, systems, and cycles by investigating characteristics of organisms, life cycles, and interactions among all the components within their habitat. Students examine how living organisms depend on each other and on their environment. (TEKS §112.13) | | | | | | |
| Notes to Teacher: | In this concept, the learners will be observing and analyzing relationships between organisms and between organisms and their environments. Schedule a time with your Science Specialist to allow the learners to do a gallery walk of the organisms and habitats from all grade levels, to give the students a chance to understand interactions in their environments. | | | | | | |
| Note to Specialist: | During the organisms and environments unit, 2nd grade classes will need to walk a gallery of the various living organisms from every grade level in order to observe them in their environments. You can facilitate this process by setting up at least one example of each organism in its habitat, from each grade level, in your Science Lab. | | | | | | |
| Key Academic Vocabulary: | | | | | | | |
| interdependence | interdependencia | oxygen | oxígeno | energy transfer | transferencia de energía | carbon dioxide | dióxido de carbón |
| environment | medioambiente | exchange | intercambio | | | | |
| Vertical Alignment: | | | | | | | |
| 1st Grade | | | ← Before After → | 3rd Grade | | | |
| 1.9B analyze and record examples of interdependence found in various situations such as terrariums and aquariums or pet and caregiver | | | | 3.9B identify and describe the flow of energy in a food chain and predict how changes in a food chain affect the ecosystem such as removal of frogs from a pond or bees from a field | | | |

Grade 2 Science Curriculum Guide

| Engage | Explore | Explain | Extend | Evaluate |
|---|--|---|--|----------|
| Interdependence (1 week) | | | | |
| *Living specimens: Discuss how butterflies rely on flowers to provide the energy they need to survive. This discussion can be extended to include other living things in a butterfly’s natural environment. (NSRC <u>The Life Cycle of Butterflies</u> “Lesson 11: The Butterfly’s Body” – focus discussion on the proboscis and how the butterfly gets its energy and “Lesson 12: “The Butterflies Go Free.”) | | | | |
| <p>Ask the learners how plants and animals help each other. Include a discussion about oxygen/carbon dioxide transfer between plants and animals. Create a list based on the learners’ responses. Discuss.</p> <p>Explain that this week we will be exploring how organisms interact with each other and their environments to meet their needs.</p> | <p>Read textbook pages with the class, and discuss the interactions presented in the textbook. This discussion can be extended to include a basic understanding of energy transfer. However, it is not necessary to go in-depth into food chains.</p> <p>Using the caterpillars and the mallow plant as an example, engage the students in a discussion of interdependence. Diagram and chart information as it is discussed. This will serve as a model for students to follow as they journal their observations and analysis in the gallery walk of organisms and environments.</p> | <p>Gallery Walk: Take the learners to the Science Lab to conduct a gallery walk of organisms and habitats from all grade levels.</p> <p>The students will be expected to journal their observations and analysis of interdependence. They will then be expected to work together to create a diagram and present their findings to the class.</p> | | |
| | <p>Textbooks pages B21-B23</p> | | <p>See Science Specialist to arrange gallery walk.</p> | |

Grade 2 Science Curriculum Guide

| Unit 5 | | | | | | | |
|--|----------|---|---------------------|--|-------|--------|----------|
| Generalizations: | | I know that plants can adapt to live in their environments. | | | | | |
| TEKS / Student Expectation: | | 2.9A identify the basic needs of plants and animals @2.10B observe, record, and compare how the physical characteristics of plants help them meet their basic needs such as stems carry water throughout the plant | | | | | |
| Formal Assessment: | | See ELA and informational literacy research rubrics. | | | | | |
| Clarifications: | | Within the living environment, students explore patterns, systems, and cycles by investigating characteristics of organisms, life cycles, and interactions among all the components within their habitat. Students examine how living organisms depend on each other and on their environment. (TEKS §112.13) | | | | | |
| Notes to Teacher: | | | | | | | |
| Key Academic Vocabulary: | | | | | | | |
| seed | semilla | roots | raíces | leaf | hojas | absorb | absorber |
| seedling | plántula | stem | tallo | flower | flor | | |
| Vertical Alignment: | | | | | | | |
| 1st Grade | | | ← Before After → | 3rd Grade | | | |
| 1.10B identify and compare the parts of plants | | | | 3.10A explore how structures and functions of plants and animals allow them to survive in a particular environment | | | |

Grade 2 Science Curriculum Guide

| Engage | Explore | Explain | Extend | Evaluate |
|--|--|---------|--------|--|
| Research – Organisms & Environmental Concepts (2 weeks) | | | | |
| | | | | |
| <p>Remind the learners of the research process that they have learned in language arts. Explain that the class will be working on a research project to learn as much as we can about plants, their parts, and how they survive in their environments.</p> | <p>Culminating Project: Following ELA guidelines for research to investigate organisms and their habitats.</p> | | | <p>Research can be presented in the following forms: role play, diagram with caption, plant information trading cards, class presentations, poster, a flipbook, etc.</p> |
| <p>Internet resources and reference materials.</p> | | | | |