Pacing Guide

Level 2 Module 3

PLANTS

with Spotlight Lessons on Living Things and Their Environments

Each *PhD Science® Texas* Level 2 lesson requires 35 minutes of instructional time. This guide is intended for teachers who are providing in-person instruction. This guide presents lesson objectives and activities by concept and multiple pacing options to allow teachers to maximize instructional time while remaining responsive to student needs. Choose one or more options for each lesson. Note that pacing options do not omit parts of lessons. Teacher choice days are also included in this pacing guide to allow for review, reteaching, assessment, and extension activities.

Pacing Option Key

Lesson Split: This symbol identifies single lessons teachers may split across 2 days.

Cross-Curricular Activity: This symbol identifies parts of lessons teachers may incorporate during instructional time for other content areas, such as English, math, social and emotional learning, and center time. Teachers may implement these parts before or after science instruction; for example, if the class reads a *PhD Science* core text during English instruction, students can discuss the core text during science instruction rather than reading the full text during that time.

Investigation Preparation: This symbol identifies preparation the teacher may do in advance of an investigation. This advance preparation does not interfere with student learning.

Teacher Think Aloud: This symbol identifies activities that are appropriate for a teacher Think Aloud. Suggested primarily for use during station activities, this option allows completion of these activities as a class. During a teacher Think Aloud, the teacher assumes the role of a student and verbalizes the thought process of a student completing the activity to engage students with intentional questioning techniques. The teacher may also ask students to model appropriate procedures and participate in collaborative conversations.

Shared Media Experience: This symbol identifies media (e.g., videos, images) that the teacher may share with the whole class rather than having students view the media individually or in groups. After students observe the media as a class, they complete an activity.

Focal Point: This symbol identifies parts of lessons teachers should emphasize. For example, in an activity with multiple resources (e.g., videos, texts, charts), a focal point identifies the most important resources, thus ensuring the coherence of the lessons.

Instructional Note: This symbol identifies parts of lessons that have instructional notes that describe time-saving strategies. Examples of such instructional notes are Differentiation supports that provide sentence frames for writing assignments and Teacher Notes that suggest alternative activities.

Instructional Routine: This symbol identifies opportunities to use alternative instructional routines. See the Implementation Guide for information on instructional routines.

Module at a Glance

This module contains 30 lessons plus 10 spotlight lessons on Living Things and Their Environments. Even with lesson splits and teacher choice days, this module should take no more than 47 days to complete. This maximum number of days ensures the implementation of all Level 2 modules within a school year that has 150 days of science instruction.

Plants

ANCHOR PHENOMENON:

Plant Recovery Around Mount St. Helens

ESSENTIAL QUESTION:

How did local plants recover after the eruption of Mount St. Helens?

Concept	Recommended Number of Days	TEKS Alignment	ELPS Alignment
Concept 1 (Lessons 1–7): Plant Growth **Focus Question:** Do different amounts of natural resources change how well a certain kind of plant grows? Different kinds of plants need different amounts of water and light to grow.	7 days	2.1A, 2.1B, 2.1C, 2.1D, 2.1E, 2.1G, 2.2B, 2.2C, 2.3A, 2.3B, 2.4B, 2.5A, 2.5B, 2.5C, 2.5F, 2.5G, 2.12A, 2.13A	2D, 3B, 3G, 4D, 4F, 4G, 5B
Concept 2 (Lessons 8–13): Pollination **Focus Question:** How can pollination involve animals? Some plants depend on animals for pollination.	6 days	2.1A, 2.1C, 2.1D, 2.1E, 2.1G, 2.2A, 2.2B, 2.2C, 2.3A, 2.3B, 2.5B, 2.5C, 2.5D, 2.5F, 2.12A, 2.12C, 2.13A, 2.13B	3B, 1E, 3E, 4C
Application of Concepts (Lessons 14–18): Engineering Challenge **Phenomenon Question:** How can humans pollinate a plant? Humans can use their knowledge of pollination to design solutions to pollinate plants.	5–6 days	2.1A, 2.1B, 2.1C, 2.1D, 2.1E, 2.1F, 2.1G, 2.2A, 2.2B, 2.2D, 2.3A, 2.3B, 2.3C, 2.4A, 2.4B, 2.5B, 2.5C, 2.5F, 2.12C, 2.13A	2I, 3D
Concept 3 (Lessons 19–25): Seed Travel **Focus Question:** How can seeds travel to new places? Seeds can travel in many ways, some of which involve animals.	7–9 days	2.1D, 2.1E, 2.1F, 2.1G, 2.2B, 2.2C, 2.3A, 2.3B, 2.3C, 2.5A, 2.5B, 2.5C, 2.5D, 2.5F, 2.12A, 2.12B, 2.12C, 2.13A	1E, 3D, 3G, 4C, 4D, 4F, 5B

Concept	Recommended Number of Days	TEKS Alignment	ELPS Alignment
Application of Concepts (Lessons 26–30): End-of-Module Socratic Seminar, Assessment, and Debrief **Essential Question:** How did local plants recover after the eruption of Mount St. Helens? Different kinds of plants have different needs for growth and depend on certain interactions for pollination and seed travel.	5–7 days	2.1B, 2.1D, 2.1E, 2.1F, 2.1G, 2.2B, 2.2C, 2.3A, 2.3B, 2.3C, 2.4B, 2.5A, 2.5B, 2.5C, 2.5D, 2.5F, 2.5G, 2.12A, 2.12B, 2.12C, 2.13A	3E, 3F

Spotlight Lessons on Living Things and Their Environments

Lesson Sets	Recommended Number of Days	TEKS Alignment	ELPS Alignment
Lessons 1–2: Environments in Big Thicket National Preserve **Phenomenon Question:** How does the longleaf pine forest environment compare with the cypress slough environment in Big Thicket National Preserve? The cypress slough and longleaf pine forest environments in Big Thicket National Preserve have similar weather conditions but different land and water features.	2–3 days	2.1A, 2.1E, 2.1F, 2.2B, 2.3A, 2.3B, 2.5B, 2.5D, 2.12A, 2.13D	1A, 1D
Lessons 3–4: Body Parts and Behaviors of Animals **Phenomenon Question:** How do animals get what they need in their environment? Animals use their body parts and behaviors to get food, water, and air from their environments.	2 days	2.1E, 2.1F, 2.3A, 2.3B, 2.5D, 2.5F, 2.12A, 2.13B	2I
Lessons 5–6: Animal Life Cycles **Phenomenon Question:** How do animals change during their life cycle? Some animals have body parts that change during their life cycle. These changes help those animals meet their needs in their environment.	2 days	2.1D, 2.1E, 2.1F, 2.1G, 2.3A, 2.3B, 2.5D, 2.5F, 2.13B, 2.13C, 2.13D	1A, 1D, 2I
Lessons 7–8: Animal Groups **Phenomenon Question:** Why are some animals part of a group? Some animals benefit from being part of a group.	2 days	2.1A, 2.1C, 2.1E, 2.1F, 2.1G, 2.3A, 2.3B, 2.5A, 2.5D, 2.5F, 2.13C, 2.13D	1E, 4C, 4D, 4G

Lesson Sets	Recommended Number of Days	TEKS Alignment	ELPS Alignment
Lessons 9–10: Environments of the Great Smoky Mountains **Phenomenon Question:** How do animals meet their needs in the different environments of Great Smoky Mountains National Park? Different environments have different physical characteristics. Animals have structures and behaviors that help them meet their needs in their environment.	2–3 days	2.1E, 2.1F, 2.1G, 2.2B, 2.3A, 2.3B, 2.3C, 2.5A, 2.5D, 2.5F, 2.5G, 2.12A, 2.13B, 2.13C, 2.13D	1E, 2I

Year at a Glance

This year at a glance chart shows where all three modules fit in a year. To ensure completion of each module, it is recommended to teach science 5 days a week.

Module 1	Module 2	Module 3
August	November	February
September	December	March
October	January	April

MODULE 1

Plants

CONCEPT 1

Do different amounts of natural resources change how well a certain kind of plant grows? 7 days

Lessons 1–2: Mount St. Helens

TEKS 2.12A, 2.13A, 2.1A, 2.1E, 2.1G, 2.3A, 2.5B, 2.5F, 2.5G **ELPS** 4D, 4F, 4G

Lessons	Pacing Options
Lesson 1: Observe the effects of the 1980 eruption of Mount St. Helens on the surrounding area.	Use Differentiation note in Develop Initial Models. Use a timer to pace students while drawing in Develop Initial Models.
Lesson 2: Develop an anchor model to show how plants around Mount St. Helens recovered after its eruption.	Use the third Teacher Note in Develop Anchor Model.

Lessons 3–6: Plant Growth Around Mount St. Helens

TEKS 2.12A, 2.13A, 2.1A, 2.1B, 2.1C, 2.1D, 2.1E, 2.1G, 2.2B, 2.2C, 2.4B, 2.5A, 2.5B, 2.5C, 2.5G **ELPS** 3B, 3G, 4D

Lessons	Pacing Options
Lesson 3: Examine photographs to determine that the eruption of Mount St. Helens changed the amount of sunlight available to local plants.	Use an alternate collaborative conversation routine in Launch. Share photographs as students observe similarities and differences in Compare Before and After Plant Photographs.
Lesson 4: Plan an investigation to determine how different amounts of water or light affect plant growth.	None
Lesson 5: Begin an investigation to determine how different amounts of water or light affect plant growth.	Use sidebar Teacher Note in Begin Investigation. Assign roles within each group in Begin Investigation.
Lesson 6: Explore the use of standard units to collect data about plant growth.	None

Lesson 7: Plant Growth

TEKS 2.12A, 2.13A , 2.1A, 2.1B, 2.3A, 2.3B, 2.5B, 2.5F **ELPS** 2D, 5B

Lessons	Pacing Options
Lesson 7: Plan an investigation to test the effects of water or light on a desert plant's growth.	Use Differentiation note in Conceptual Checkpoint Part B. Use an alternative collaborative conversation routine in Debrief Conceptual Checkpoint. **Conceptual Checkpoint**

CONCEPT 2

How can pollination involve animals? 6 days

Lessons 8–11: Pollination by Animals

TEKS 2.12A, 2.12C, 2.13A, 2.13B, 2.1C, 2.1D, 2.1E, 2.1G, 2.2A, 2.2B, 2.2C, 2.3A, 2.3B, 2.5B, 2.5C, 2.5D, 2.5F
ELPS 3B

Lessons	Pacing Options
Lesson 8: Analyze data from a blueberry plant investigation.	Use an alternative collaborative conversation routine in Discuss Blueberry Plant Investigation Results.
Lesson 9: Observe and demonstrate animal interaction with flowers to determine that pollen sticks to animals.	Share chenille stem with pollen using document camera while students make observations in Examine Pollen.
Lesson 10: View photographs of a plant before and after pollination to notice that plants can produce seeds after pollination.	Focus on video segment in first Teacher Note in Launch.
Lesson 11: Use a model to communicate the process of pollination.	Use Differentiation note in Examine Blueberries.

Lesson 12: Saguaro Pollination

TEKS 2.12C, 2.13A, 2.1G, 2.3A, 2.3B, 2.5B, 2.5D, 2.5F **ELPS** 1E, 3E

Lessons	Pacing Options
Lesson 12: Develop a model to show the pollination of saguaro flowers.	Use Differentiation note in Conceptual Checkpoint. Use an alternative collaborative conversation routine in Land. **Conceptual Checkpoint**

Lesson 13: Pollination

TEKS 2.12C, 2.13A, 2.1A, 2.3B, 2.5D, 2.5F **ELPS** 4C

Lessons	Pacing Options
Lesson 13: Analyze photographs to determine that wind can pollinate plants.	None

ENGINEERING CHALLENGE

How can humans pollinate a plant? 5–6 days

Lessons 14–18: Engineering Challenge

TEKS 2.12C, 2.13A, 2.1A, 2.1B, 2.1C, 2.1D, 2.1E, 2.1F, 2.1G, 2.2A, 2.2B, 2.2D, 2.3A, 2.3B, 2.3C, 2.4A, 2.4B, 2.5B, 2.5C, 2.5F **ELPS** 2I, 3D

Lessons	Pacing Options
Lesson 14: Apply the engineering design process to design, build, and test a solution to pollinate flowers.	Use Differentiation note in Ask About an Engineering Problem. **Engineering Challenge**
Lesson 15: Apply the engineering design process to design, build, and test a solution to pollinate flowers.	Use Differentiation note in Imagine Pollination Tools. **Engineering Challenge**
Lesson 16: Apply the engineering design process to design, build, and test a solution to pollinate flowers.	Use Differentiation note in Plan Pollination Tools. Use Teacher Note in Create Pollination Tools. Use the first Teacher Note in Test Pollination Tools. **Engineering Challenge**
Lesson 17: Apply the engineering design process to design, build, and test a solution to pollinate flowers.	Use an alternative collaborative conversation routine in Launch. Use Differentiation note in Launch. **Engineering Challenge**
Lesson 18: Apply the engineering design process to design, build, and test a solution to pollinate flowers.	**Day 1:** Launch through Prepare Presentations **Day 2:** Share Pollination Tool Designs through Land **Engineering Challenge**

CONCEPT 3

How can seeds travel to new places? 7–9 days

Lessons 19–20: Huckleberry Plants

TEKS 2.12B, 2.12C, 2.13A, 2.1D, 2.1E, 2.1G, 2.2B, 2.2C, 2.3A, 2.3B, 2.5B, 2.5C, 2.5F **ELPS** 3D, 3G

Lessons	Pacing Options
Lesson 19: Observe huckleberries and coyote droppings to consider how huckleberry seeds might travel to new places.	Use an alternative collaborative conversation routine in Observe Huckleberries. Have students share drawings in pairs instead of groups in Draw Huckleberry Travel.
Lesson 20: Analyze data about huckleberry plant growth, and develop a model that shows one way huckleberry seeds travel to new places.	**Day 1:** Launch through Analyze Coyote Dropping and Huckleberry Plant Data **Day 2:** Model Huckleberry Seed Movement through Land

Lesson 21: Food Chains

TEKS 2.12A, 2.12B, 2.1G, 2.2B, 2.3A, 2.3B, 2.3C, 2.5A, 2.5F **ELPS** 4F

Lessons	Pacing Options
Lesson 21: Develop food chains to show how animals depend on other living things for food.	Think Aloud one set of food chain cards in Develop Food Chains. Use alternative instructional routine in Develop Food Chains.

Lessons 22–23: Properties of Fruit

TEKS 2.12B, 2.12C, 2.13A, 2.1D, 2.1E, 2.1F, 2.2B, 2.3A, 2.5A, 2.5B, 2.5F **ELPS** 1E, 4C, 4D

Lessons	Pacing Options
Lesson 22: Observe and compare the properties of fruits to make and support a claim that some fruits can stick to animals.	Use Differentiation note in Observe Properties of Fruits.
Lesson 23: Describe the properties of fruits, and explain how these properties can help seeds travel to new places.	Read *Seeds Move!* (Page 2019) in Read About Seed Travel before the lesson.

Lessons 24–25: Seed Travel

TEKS 2.12B, 2.12C, 2.13A, 2.1G, 2.2C, 2.3A, 2.5A, 2.5B, 2.5D, 2.5F **ELPS** 4F, 5B

Lessons	Pacing Options
Lesson 24: Use observations of models to describe how seeds can travel in the Sonoran Desert.	**Conceptual Checkpoint**
Lesson 25: Observe data and photographs to determine that seed travel contributed to plant recovery near Mount St. Helens after the 1980 eruption.	 **Day 1:** Launch through Explore Plant Recovery at Mount St. Helens **Day 2:** Summarize Seed Travel through Land

APPLICATION OF CONCEPTS

How did local plants recover after the eruption of Mount St. Helens?

5–7 days

Lessons 26–30: End-of-Module Socratic Seminar, Assessment, and Debrief

TEKS 2.12A, 2.12B, 2.12C, 2.13A, 2.1B, 2.1D, 2.1E, 2.1F, 2.1G, 2.2B, 2.2C, 2.3A, 2.3B, 2.3C, 2.4B, 2.5A, 2.5B, 2.5C, 2.5D, 2.5F, 2.5G **ELPS** 3E, 3F

Lessons	Pacing Options
Lesson 26: Graph investigation data to compare the effects of different amounts of water or light on plant growth.	Use Differentiation note in Land.
Lesson 27: Determine that different kinds of plants need different amounts of water and light.	**Day 1:** Launch through Answer Investigation Questions **Day 2:** Compare Plants through Land Use Differentiation note in Answer Investigation Questions.
Lesson 28: Explain different ways plants recovered in the area around Mount St. Helens after the 1980 eruption. (Socratic Seminar)	Use an alternative instructional routine in Launch. Use Teacher Note in Engage in Socratic Seminar. Use Differentiation note in Land. **Socratic Seminar**
Lesson 29: Explain how the Geyer willow meets its needs for growth in Yellowstone National Park. (End-of-Module Assessment)	**End-of-Module Assessment**
Lesson 30: Explain the ways plants meet their needs for growth and grow in new places. (End-of-Module Debrief)	Use first Differentiation note in Reflect on Recurring Themes and Concepts in Module Learning. Use second Differentiation note in Reflect on Recurring Themes and Concepts in Module Learning. **End-of-Module Debrief**
Teacher Choice Day	Review, reteach, assess, or complete extension activities.

SPOTLIGHT LESSONS ON

Living Things and Their Environments

How can many different kinds of animals live in Big Thicket National Preserve? 10–12 days

Lessons 1–2: Environments in Big Thicket National Preserve

TEKS 2.12A, 2.13D, 2.1A, 2.1E, 2.1F, 2.2B, 2.3A, 2.3B, 2.5B, 2.5D **ELPS** 1A, 1D

Lessons	Pacing Options
Lesson 1: Compare temperature and precipitation data for two environments in Big Thicket National Preserve.	Use third Teacher Note in Launch. Think Aloud cypress slough graphs in Graph Precipitation and Temperature Data. Use an alternative collaborative conversation routine in Analyze Data.
Lesson 2: Observe videos, a map, and a diagram of environments in Big Thicket National Preserve.	**Day 1:** Launch through Identify Floodplains **Day 2:** Define Elevation through Land

Lessons 3–4: Body Parts and Behaviors of Animals

TEKS 2.12A, 2.13B, 2.1E, 2.1F, 2.3A, 2.3B, 2.5D, 2.5F **ELPS** 2I

Lessons	Pacing Options
Lesson 3: Observe how animals use their body parts and behaviors to get what they need from their environment.	Use Differentiation note in Identify Bird Body Parts. Use an alternative collaborative conversation routine in Identify Bird Body Parts. Use inline Teacher Note in Visit Bird Stations. Use Differentiation note in Compare Bird Body Parts and Behaviors.
Lesson 4: Compare how different animals use their body parts and behaviors to get what they need in their environment	Think Aloud an animal station in Visit Animal Stations. Share animal videos while students record observations in Visit Animal Stations.

Lessons 5–6: Animal Life Cycles

TEKS 2.13B, 2.13C, 2.13D, 2.1D, 2.1E, 2.1F, 2.1G, 2.3A, 2.3B, 2.5D, 2.5F **ELPS** 1A, 1D, 2I

Lessons	Pacing Options
Lesson 5: Observe the life cycle stages of frogs and butterflies and identify how the body parts of these animals change during their life cycles.	Use second Differentiation note in Create Butterfly Life Cycle Model. Use an alternative instructional routine in Land. Use Differentiation note in the Land.
Lesson 6: Obtain information about young and adult frogs and butterflies to compare how they use body parts and behaviors to help them survive at different stages of life.	Use Differentiation note in Visit Life Cycle Needs Stations. Share life cycle needs videos while students record observations in Visit Life Cycle Needs Stations. Use an alternative collaborative conversation routine in Compare Young and Adult Animal Needs. Use Teacher Note in Compare Young and Adult Animal Needs.

Lessons 7–8: Animal Groups

TEKS 2.13C, 2.13D, 2.1A, 2.1C, 2.1E, 2.1F, 2.1G, 2.3A, 2.3B, 2.5A, 2.5D, 2.5F **ELPS** 1E, 4C, 4D, 4G

Lessons	Pacing Options
Lesson 7: Model animal behavior to explain how being part of a group can help animals get food, protect themselves, and deal with changes in temperature.	Think Aloud Leafcutting Ant Station in Model Group Behavior.
Lesson 8: Compare the behaviors of different animal groups.	Think Aloud three group behavior cards (1 food, 1 protection, 1 temperature) in Compare Animal Groups. Use an alternative collaborative conversation routine in Compare Animal Groups. Read *Packs: Strength in Numbers* (Salyer 2020) in Read About Animal Groups before the lesson.

Lessons 9–10: End-of-Spotlight Socratic Seminar, Assessment, and Debrief

TEKS 2.12A, 2.13B, 2.13C, 2.13D, 2.1E, 2.1F, 2.1G, 2.2B, 2.3A, 2.3B, 2.3C, 2.5A, 2.5D, 2.5F, 2.5G **ELPS** 1E, 2I

Lessons	Pacing Options
Lesson 9: Explain how living things can meet their needs in Great Smoky Mountains National Park. (End-of-Spotlight Assessment)	Use an alternative instructional routine in Launch. **End-of-Spotlight Assessment**
Lesson 10: Explain how living things can meet their needs in Great Smoky Mountains National Park. (End-of-Spotlight Assessment Debrief)	Use second Differentiation note in Reflect on Recurring Themes and Concepts. **End-of-Spotlight Assessment Debrief**
Teacher Choice Day	Review, reteach, assess, or complete extension activities.

Texas Essential Knowledge and Skills (TEKS)

Content Standards

2.12 Organisms and environments. The student knows that living organisms have basic needs that must be met through interactions within their environment. The student is expected to

- **2.12A** describe how the physical characteristics of environments, including the amount of rainfall, support plants and animals within an ecosystem;
- **2.12B** create and describe food chains identifying producers and consumers to demonstrate how animals depend on other living things; and
- **2.12C** explain and demonstrate how some plants depend on other living things, wind, or water for pollination and to move their seeds around.

2.13 Organisms and environments. The student knows that organisms have structures and undergo processes that help them interact and survive within their environments. The student is expected to

- **2.13A** identify the roots, stems, leaves, flowers, fruits, and seeds of plants and compare how those structures help different plants meet their basic needs for survival;
- **2.13B** record and compare how the structures and behaviors of animals help them find and take in food, water, and air;
- **2.13C** record and compare how being part of a group helps animals obtain food, defend themselves, and cope with changes; and
- **2.13D** investigate and describe some of the unique life cycles of animals where young animals do not resemble their parents, including butterflies and frogs.

Scientific and Engineering Practices

2.1 Scientific and engineering practices. The student asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. The student is expected to

- **2.1A** ask questions and define problems based on observations or information from text, phenomena, models, or investigations;
- **2.1B** use scientific practices to plan and conduct simple descriptive investigations and use engineering practices to design solutions to problems;
- **2.1C** identify, describe, and demonstrate safe practices during classroom and field investigations as outlined in Texas Education Agency–approved safety standards;
- **2.1D** use tools, including hand lenses, goggles, heat-resistant gloves, trays, cups, bowls, beakers, notebooks, stream tables, soil, sand, gravel, flowering plants, student thermometer, demonstration thermometer, rain gauge, flashlights, ramps, balls, spinning tops, drums, tuning forks, sandpaper, wax paper, items that are flexible, non-flexible items, magnets, hot plate, aluminum foil, Sun-Moon-Earth model, and frog and butterfly life cycle models to observe, measure, test, and compare;
- **2.1E** collect observations and measurements as evidence;
- **2.1F** record and organize data using pictures, numbers, words, symbols, and simple graphs; and
- **2.1G** develop and use models to represent phenomena, objects, and processes or design a prototype for a solution to a problem.

2.2 Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. The student is expected to

- **2.2A** identify basic advantages and limitations of models such as their size, properties, and materials;
- **2.2B** analyze data by identifying significant features and patterns;
- **2.2C** use mathematical concepts to compare two objects with common attributes; and
- **2.2D** evaluate a design or object using criteria to determine if it works as intended.

2.3 Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to

- **2.3A** develop explanations and propose solutions supported by data and models;
- **2.3B** communicate explanations and solutions individually and collaboratively in a variety of settings and formats; and
- **2.3C** listen actively to others' explanations to identify important evidence and engage respectfully in scientific discussion.

2.4 Scientific and engineering practices. The student knows the contributions of scientists and recognizes the importance of scientific research and innovation for society. The student is expected to

- **2.4A** explain how science or an innovation can help others and
- **2.4B** identify scientists and engineers such as Alexander Graham Bell, Marie Daly, Mario Molina, and Jane Goodall and explore what different scientists and engineers do.

Recurring Themes and Concepts

2.5 Recurring themes and concepts. The student uses recurring themes and concepts to make connections across disciplines. The student is expected to

- **2.5A** identify and use patterns to describe phenomena or design solutions;
- **2.5B** investigate and predict cause-and-effect relationships in science;
- **2.5C** measure and describe the properties of objects in terms of size and quantity;
- **2.5D** examine the parts of a whole to define or model a system;
- **2.5F** describe the relationship between structure and function of objects, organisms, and systems; and
- **2.5G** describe how factors or conditions can cause objects, organisms, and systems to either change or stay the same.

English Language Proficiency Standards (ELPS)

- **1A** Use prior knowledge and experiences to understand meanings in English.
- **1D** Speak using learning strategies such as requesting assistance, employing non-verbal cues, and using synonyms and circumlocution (conveying ideas by defining or describing when exact English words are not known).
- **1E** Internalize new basic and academic language by using and reusing it in meaningful ways in speaking and writing activities that build concept and language attainment.
- **2D** Monitor understanding of spoken language during classroom instruction and interactions and seek clarification as needed.
- **2I** Demonstrate listening comprehension of increasingly complex spoken English by following directions, retelling or summarizing spoken messages, responding to questions and requests, collaborating with peers, and taking notes commensurate with content and grade-level needs.
- **3B** Expand and internalize initial English vocabulary by learning and using high-frequency English words necessary for identifying and describing people, places, and objects, by retelling simple stories and basic information represented or supported by pictures, and by learning and using routine language needed for classroom communication.
- **3D** Speak using grade-level content area vocabulary in context to internalize new English words and build academic language proficiency.
- **3E** Share information in cooperative learning interactions.
- **3F** Ask and give information ranging from using a very limited bank of high-frequency, high-need, concrete vocabulary, including key words and expressions needed for basic communication in academic and social contexts, to using abstract and content-based vocabulary during extended speaking assignments.
- **3G** Express opinions, ideas, and feelings ranging from communicating single words and short phrases to participating in extended discussions on a variety of social and grade-appropriate academic topics.
- **4C** Develop basic sight vocabulary, derive meaning of environmental print, and comprehend English vocabulary and language structures used routinely in written classroom materials.
- **4D** Use prereading supports such as graphic organizers, illustrations, and pretaught topic-related vocabulary and other prereading activities to enhance comprehension of written text.

4F Use visual and contextual support and support from peers and teachers to read grade-appropriate content area text, enhance and confirm understanding, and develop vocabulary, grasp of language structures, and background knowledge needed to comprehend increasingly challenging language.

4G Demonstrate comprehension of increasingly complex English by participating in shared reading, retelling or summarizing material, responding to questions, and taking notes commensurate with content area and grade level needs.

5B Write using newly acquired basic vocabulary and content-based grade-level vocabulary.