Pacing Guide

Level K Module 1

WEATHER

with Spotlight Lessons on Magnets

Each *PhD Science® Texas* Level K 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 8 spotlight lessons on Magnets. Even with lesson splits and teacher choice days, this module should take no more than 50 days to complete. This maximum number of days ensures the implementation of all Level K modules within a school year that has 150 days of science instruction.

Weather

ANCHOR PHENOMENON:

Cliff Dwellings at Mesa Verde

ESSENTIAL QUESTION:

How did the cliff dwellings at Mesa Verde protect people from the weather?

Concept	Recommended Number of Days	TEKS Alignment	ELPS Alignment
Concept 1 (Lessons 1–11): Parts of Weather **Focus Question:** What is weather? Weather is the combination of sunlight, clouds, wind, rain and snow, and temperature in a particular place at a particular time. Different parts of weather have different effects on people and their surroundings.	11–18 days	K.1A, K.1B, K.1C, K.1D, K.1E, K.1F, K.1G, K.2D, K.4B K.5C, K.5G, K.6, K.8B, K.9B, K.10A, K.10B, K.10C, K.11, K.12B	2E, 3C, 3E, 3F, 3H, 4A, 4C
Application of Concepts (Lessons 12–16): Engineering Challenge **Phenomenon Question:** How can we help archaeologists feel cooler when they work? People can use the engineering design process to create shelters for shade.	5 days	K.1A, K.1B, K.1C, K.1E, K.1G, K.2D, K.3A, K.3B, K.4A, K.4B, K.5F, K.6, K.8B, K.12B	3F, 4C
Concept 2 (Lessons 17–21): Weather Data **Focus Question:** What does weather data reveal? Analyzing weather data can reveal patterns.	5–7 days	K.1E, K.1F, K.2B, K.4B, K.5A, K.9A, K.10B, K.10C, K.11	3F, 3H
Concept 3 (Lessons 22–27): Severe Weather **Focus Question:** How does severe weather affect us? Meteorologists can predict severe weather so that communities can prepare.	6–7 days	K.1A, K.1E, K.1F, K.2B, K.4B, K.5A, K.5F, K.9A, K.9B, K.10B, K.11, K.12B	2E, 2I, 3E, 3H
Application of Concepts (Lessons 28–30): End-of-Module Socratic Seminar, Assessment and Debrief **Essential Question:** How did the cliff dwellings at Mesa Verde protect people from the weather? Weather affects people and their surroundings.	3–4 days	K.1F, K.2B, K.3B, K.5A, K.5F, K.8B, K.9A, K.9B, K.10B, K.10C, K.12B	3E, 3F

Spotlight Lessons on Magnets

Lesson Sets	Recommended Number of Days	TEKS Alignment	ELPS Alignment
Lesson 1: Pushes and Pulls **Phenomenon Question:** What makes objects move? Pushes and pulls can cause objects to move.	1 day	K.1A, K.1B, K.1C, K.5B, K.7	1D
Lessons 2–3: Magnets **Phenomenon Question:** How are magnets used to move objects in toys and games? Magnets can push or pull objects that have certain properties.	3 days	K.1A, K.1B, K.1C, K.1F, K.1G, K.5B, K.6, K.7	3D
Lessons 4–8: Engineering Challenge **Phenomenon Question:** How can we use magnets to keep pieces on a board game? People can use interactions of magnets with other materials in design solutions for board games.	4–5 days	K.1A, K.1B, K.1C, K.1E, K.1F, K.1G, K.2D, K.3A, K.5A, K.5B, K.6, K.7	3C, 4G

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

Weather

CONCEPT 1

What is weather? 11–18 days

Lessons 1–2: Cliff Dwellings at Mesa Verde

TEKS K.10B, K.11, K.12B, K.1A, K.1C, K.1G, K.4B, K.5C **ELPS** 3E, 4A

Lessons	Pacing Options
Lesson 1: Build a tent to explore the purpose of shelters.	Think Aloud photograph in Launch. Use Differentiation note in Build a Tent.
Lesson 2: Develop an anchor model of a Mesa Verde cliff dwelling.	**Day 1:** Launch through Notice and Wonder about Mesa Verde **Day 2:** Develop Anchor Model through Land Use an alternative collaborative conversation routine in Notice and Wonder About Mesa Verde.

Lesson 3: Local Weather

TEKS K.9B, K.10B, K.1A **ELPS** 4C

Lessons	Pacing Options
Lesson 3: Examine and sort photographs of outdoor activities and ask questions about the weather.	**Day 1:** Launch through Sort Outdoor Activity Cards **Day 2:** Build Driving Question Board through Land Use second Teacher Note in Launch. Use an alternative collaborative conversation routine in Sort Outdoor Activity Cards. Think Aloud a few questions in Build Driving Question Board.

Lesson 4–7: Describing Weather

TEKS K.6, K.9B, K.10B, K.10C, K.1A, K.1B, K.1C, K.1D, K.1E, K.1F, K.1G, K.2D, K.4B, K.5C **ELPS** 3H, 4C

Lessons	Pacing Options
Lesson 4: Record observations of cloud cover, rain, and snow.	Complete drawing activity in Launch before the lesson. Use Teacher Note in Launch. Think Aloud partly sunny cards in Describe Cloud Cover, Rain, and Snow. Use second Teacher Note in Describe Cloud Cover, Rain, and Snow.
Lesson 5: Learn how to use a thermometer to measure temperature.	**Day 1:** Launch through Explore Thermometers **Day 2:** Act Like a Thermometer through Land Use first Teacher Note in Explore Thermometers.
Lesson 6: Design a tool to measure the wind.	**Day 1:** Launch through Imagine a Wind Measuring Tool (fan and hair dryer comparison) **Day 2:** Imagine a Wind Measuring Tool (materials testing) through Land Use second Teacher Note in Imagine a Wind Measuring Tool. Use an alternative collaborative conversation routine in Land.
Lesson 7: Create, improve, and share a wind measuring tool.	**Day 1:** Launch through Create and Improve a Wind Measuring Tool **Day 2:** Share a Wind Measuring Tool through Land Think Aloud testing one material in Create and Improve a Wind Measuring Tool. Use first sidebar Teacher Note in Land.

Lessons 8–9: Effects of Weather

TEKS K.6, K.8B, K.10A, K.10B, K.1A, K.1B, K.1C, K.1D, K.1E, K.1F, K.5G **ELPS** 3C, 3F

Lessons	Pacing Options
Lesson 8: Model the effects of sunlight, wind, and rain on playground objects.	**Day 1:** Launch through Investigate the Effects of Wind and Rain **Day 2:** Investigate the Effects of Sunlight through Land Use second Teacher Note in Launch.
Lesson 9: Investigate temperature differences between areas in sunlight and areas in shade.	Use inline Teacher Note in Investigate Sunlight, Shade, and Temperature. Use English Language Development note in Investigate, Sunlight, Shade, and Temperature.

Lessons 10–11: Parts of Weather

TEKS K.9B, K.10B, K.10C, K.11, K.12B, K.1D, K.1E, K.1F **ELPS** 2E, 3F

Lessons	Pacing Options
Lesson 10: Recognize that different homes are shelters that can protect people from the weather.	Think Aloud one prepared shelter poster in Make a Poster. Use Differentiation note in Make a Poster.
Lesson 11: Describe how the cliff dwellings at Mesa Verde protected people from the weather.	**Day 1:** Launch through Conceptual Checkpoint Part B **Day 2:** Debrief Conceptual Checkpoint through Land Use Differentiation note in Prepare for Conceptual Checkpoint. **Conceptual Checkpoint**

APPLICATION OF CONCEPTS

How can we help archaeologists feel cooler when they work? 5 days

Lessons 12–16: Engineering Challenge

TEKS K.6, K.8B, K.12B, K.1A, K.1B, K.1C, K.1E, K.1G, K.2A, K.2D, K.3A, K.3B, K.4A, K.4B, K.5F **ELPS** 3F, 4C

Lessons	Pacing Options
Lesson 12: Apply the engineering design process to create a shelter that helps archaeologists feel cooler when they are working in the sunlight.	Use second Teacher Note in Ask About an Engineering Problem. **Engineering Challenge**
Lesson 13: Apply the engineering design process to create a shelter that helps archaeologists feel cooler when they are working in the sunlight.	Use Teacher Note in Imagine a Shelter. **Engineering Challenge**
Lesson 14: Apply the engineering design process to create a shelter that helps archaeologists feel cooler when they are working in the sunlight.	Use Differentiation note in Plan a Shelter. **Engineering Challenge**
Lesson 15: Apply the engineering design process to create a shelter that helps archaeologists feel cooler when they are working in the sunlight.	Use second Differentiation note in Test and Improve a Shelter. **Engineering Challenge**
Lesson 16: Apply the engineering design process to create a shelter that helps archaeologists feel cooler when they are working in the sunlight.	Display photographs of each shelter for students to observe instead of Gallery Walk in Share the Shelter. **Engineering Challenge**

CONCEPT 2

What does weather data reveal? 5–7 days

Lessons 17–20: Local Weather Data

TEKS K.9A, K.10B, K.10C, K.1E, K.1F, K.2B, K.4B, K.5A **ELPS** 3H

Lessons	Pacing Options
Lesson 17: Use weather data to identify and describe patterns in daily temperature changes.	Use an alternative collaborative conversation routine in Observe Daily Changes in Temperature.
Lesson 18: Summarize monthly temperature data.	Display counted linking cubes while students compare temperature data by using sentence frames in Analyze Monthly Temperature Data.
Lesson 19: Summarize monthly weather data.	**Day 1:** Launch through Analyze Monthly Weather Data (cloud cover) **Day 2:** Analyze Monthly Weather Data (rain, snow, and wind) through Land Use an alternative collaborative conversation routine in Launch.
Lesson 20: Explore how meteorologists predict weather and develop weather forecasts.	Think Aloud one weather forecast in Share a Weather Forecast. Finish group presentations after the lesson.

Lesson 21: Weather Data

TEKS K.9A, K.10B, K.11, K.1F, K.2B, K.5A **ELPS** 3F

Lessons	Pacing Options
Lesson 21: Use data to describe daily temperature patterns at Mesa Verde.	**Day 1:** Launch through Conceptual Checkpoint Part A **Day 2:** Conceptual Checkpoint Part B through Land **Conceptual Checkpoint**

CONCEPT 3

How does severe weather affect us? 6–7 days

Lessons 22–24: Effects of Severe Weather

TEKS K.9A, K.9B, K.10B, K.12B, K.1A, K.1E, K.1F, K.5A, K.5F **ELPS** 2I

Lessons	Pacing Options
Lesson 22: Observe and record information about different kinds of severe weather.	Use third Teacher Note in Observe Thunderstorms.
Lesson 23: Share information about different kinds of severe weather.	None
Lesson 24: Describe how severe weather affects communities.	Use Differentiation note in Draw How Severe Weather Affects a Community. Complete drawings in Draw How Severe Weather Affects a Community after the lesson.

Lessons 25–26: Preparing for Severe Weather

TEKS K.10B, K.12B, K.1A, K.1F, K.2B, K.4B, K.5A **ELPS** 3E, 3H

Lessons	Pacing Options
Lesson 25: Use data to identify and describe severe weather patterns.	Use an alternative collaborative conversation routine in Launch. Think Aloud one map and severe weather cards in Analyze Severe Weather Data. Use second Differentiation note in Analyze Severe Weather Data.
Lesson 26: Describe how communities prepare for and respond to severe weather.	None

Lesson 27: Severe Weather

TEKS K.9A, K.10B, K.11, K.12B, K.1F, K.2B, K.5A, K.5F **ELPS** 2E

Lessons	Pacing Options
Lesson 27: Describe how severe weather may have affected the Ancestral Pueblo people at Mesa Verde.	**Day 1:** Launch through Conceptual Checkpoint **Day 2:** Debrief Conceptual Checkpoint and Update Anchor Model through Land **Conceptual Checkpoint**

APPLICATION OF CONCEPTS

How did the cliff dwellings at Mesa Verde protect people from the weather? 3–4 days

Lessons 28–30: End-of-Module Socratic Seminar, Assessment, and Debrief

TEKS K.8B, K.9A, K.9B, K.10B, K.10C, K.12B, K.1E, K.1F, K.2B, K.3B, K.5A, K.5F **ELPS** 3E, 3F

Lessons	Pacing Options
Lesson 28: Explain how the cliff dwellings at Mesa Verde protected people from the weather.	Use Teacher Note in Engage in Socratic Seminar. **Socratic Seminar**
Lesson 29: Describe the weather during the Blizzard of 1978 in Boston, and explain how the storm affected people there.	**End-of-Module Assessment**
Lesson 30: Explain how the weather affects people and their surroundings.	**End-of-Module Assessment Debrief**
Teacher Choice Day	Review, reteach, assess, or complete extension activities.

SPOTLIGHT LESSONS

Magnets 8–9 days

Lesson 1: Pushes and Pulls

TEKS K.7, K.1A, K.1B, K.1C, K.5B **ELPS** 1D

Lessons	Pacing Options
Lesson 1: Identify and describe pushes and pulls.	Use inline Teacher Note in Explore Motion.

Lessons 2–3: Magnets

TEKS K.6, K.7, K.1A, K.1B, K.1C, K.1F, K.1G, K.5B **ELPS** 3D

Lessons	Pacing Options
Lesson 2: Observe and describe how a magnet interacts with different objects.	Think Aloud magnetic fishing game in Launch.
Lesson 3: Observe and describe how magnets interact with other magnets.	Use second Teacher Note in Observe How Magnets Interact.

Lessons 4–8: Engineering Challenge

TEKS K.6, K.7, K.1A, K.1B, K.1C, K.1E, K.1F, K.1G, K.2D, K.3A, K.5A, K.5B **ELPS** 3C, 4G

Lessons	Pacing Options
Lesson 4: Apply the engineering design process to create a solution for a board game with pieces that do not fall off the board.	Use Differentiation note in Ask About an Engineering Problem. **Engineering Challenge**
Lesson 5: Apply the engineering design process to create a solution for a board game with pieces that do not fall off the board.	**Engineering Challenge**
Lesson 6: Apply the engineering design process to create a solution for a board game with pieces that do not fall off the board.	Finish Create a Board Game after the lesson. **Engineering Challenge**
Lesson 7: Apply the engineering design process to create a solution for a board game with pieces that do not fall off the board.	Use second Differentiation note in Test and Improve a Board Game. **Engineering Challenge**
Lesson 8: Apply the engineering design process to create a solution for a board game with pieces that do not fall off the board.	Display photographs of each board game for students to observe instead of Gallery Walk in Share a Board Game. **Engineering Challenge**
Teacher Choice Day	Review, reteach, assess, or complete extension activities.

Texas Essential Knowledge and Skills (TEKS)

Content Standards

K.6 Matter and its properties. The student knows that objects have physical properties that determine how they are described and classified. The student is expected to

- **K.6** identify and record observable physical properties of objects, including shape, color, texture, and material, and generate ways to classify objects.

K.7 Force, motion, and energy. The student knows that forces cause changes in motion and position in everyday life. The student is expected to describe and predict how a magnet interacts with various materials and how magnets can be used to push or pull.

K.8 Force, motion, and energy. The student knows that energy is everywhere and can be observed in everyday life. The student is expected to

- **K.8B** demonstrate and explain that light travels through some objects and is blocked by other objects, creating shadows.

K.9 Earth and space. The student knows that there are recognizable patterns in the natural world and among objects in the sky. The student is expected to

- **K.9A** identify, describe, and predict the patterns of day and night and their observable characteristics; and
- **K.9B** observe, describe, and illustrate the Sun, Moon, stars, and objects in the sky such as clouds.

K.10 Earth and space. The student knows that the natural world includes earth materials and systems that can be observed. The student is expected to

- **K.10A** describe and classify rocks by the observable properties of size, shape, color, and texture;
- **K.10B** observe and describe weather changes from day to day and over seasons; and
- **K.10C** identify evidence that supports the idea that air is all around us and demonstrate that wind is moving air using items such as a windsock, pinwheel, or ribbon.

K.11 Earth and space. The student knows that earth materials are important to everyday life. The student is expected to

- **K.11** observe and generate examples of practical uses for rocks, soil, and water.

K.12 Organisms and environments. The student knows that plants and animals depend on the environment to meet their basic needs for survival. The student is expected to

- **K.12B** observe and identify the dependence of animals on air, water, food, space, and shelter.

Scientific and Engineering Practices

K.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

- **K.1A** ask questions and define problems based on observations or information from text, phenomena, models, or investigations;
- **K.1B** use scientific practices to plan and conduct simple descriptive investigations and use engineering practices to design solutions to problems;
- **K.1C** identify, describe, and demonstrate safe practices during classroom and field investigations as outlined in Texas Education Agency-approved safety standards;
- **K.1D** use tools, including hand lenses, goggles, trays, cups, bowls, sieves or sifters, notebooks, terrariums, aquariums, samples (rocks, sand, soil, loam, gravel, clay, seeds, and plants), windsock, demonstration thermometer, rain gauge, straws, ribbons, non-standard measuring items, blocks or cubes, tuning fork, various flashlights, small paper cups, items that roll, noise makers, hot plate, opaque objects, transparent objects, foil pie pans, foil muffin cups, wax paper, Sun-Moon-Earth model, and plant life cycle model to observe, measure, test, and compare;
- **K.1E** collect observations and measurements as evidence;
- **K.1F** record and organize data using pictures, numbers, words, symbols, and simple graphs; and
- **K.1G** develop and use models to represent phenomena, objects, and processes or design a prototype for a solution to a problem.

K.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

- **K.2A** identify basic advantages and limitations of models such as their size, properties, and materials;
- **K.2B** analyze data by identifying significant features and patterns; and
- **K.2D** evaluate a design or object using criteria to determine if it works as intended.

K.3 Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to

- **K.3A** develop explanations and propose solutions supported by data and models; and
- **K.3B** communicate explanations and solutions individually and collaboratively in a variety of settings and formats.

K.4 Scientific and engineering practices. The student knows the contributions of scientists and recognizes the importance of scientific research and innovation on society. The student is expected to

- **K.4A** explain how science or an innovation can help others; and
- **K.4B** identify scientists and engineers such as Isaac Newton, Mae Jemison, and Ynés Mexía and explore what different scientists and engineers do.

Recurring Themes and Concepts

K.5 Recurring themes and concepts. The student uses recurring themes and concepts to make connections across disciplines. The student is expected to

- **K.5A** identify and use patterns to describe phenomena or design solutions.;
- **K.5B** investigate and predict cause-and-effect relationships in investigate and predict cause-and-effect relationships in science;.
- **K.5F** describe the relationship between the structure and function of objects, organisms, and systems; and
- **K.5G** describe how factors or conditions can cause objects, organisms, and systems to either change or stay the same.

English Language Proficiency Standards (ELPS)

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).

2E Use visual, contextual, and linguistic support to enhance and confirm understanding of increasingly complex and elaborated spoken language.

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.

3C Speak using a variety of grammatical structures, sentence lengths, sentence types, and connecting words with increasing accuracy and ease as more English is acquired.

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.

3H Narrate, describe, and explain with increasing specificity and detail as more English is acquired.

4A Learn relationships between sounds and letters of the English language and decode (sound out) words using a combination of skills such as recognizing sound-letter relationships and identifying cognates, affixes, roots, and base words.

4C Develop basic sight vocabulary, derive meaning of environmental print, and comprehend English vocabulary and language structures used routinely in written classroom materials.

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.