

Pacing Guide

Level K Module 1

Weather with Spotlight Lessons on Forces and Motion

Each *PhD Science® TEKS Edition* 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 the needs of their students. Choose one or more options for each lesson. Note that pacing options do not omit parts of lessons.

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.



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



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.

Module at a Glance

This module contains 30 lessons with 4 spotlight lessons on Forces and Motion. Even with lesson splits, this module should take no more than 47 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?	Recommended Number of Days	TEKS and 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.	11–19 days	K.2A, K.2B, K.2C, K.2D, K.2E, K.3A, K.3C, K.4A, K.4B, K.5A, K.5B, K.6A, K.7C, K.8A, K.8C ELPS: 1C, 2F, 3C, 3E, 3F, 3G, 3J, 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.2A, K.2B, K.2C, K.2E, K.3A, K.3C, K.4B, K.5A, K.5B, K.6A ELPS: 2F, 3G
Concept 2 (Lessons 17–21): Weather Data Focus Question: What does weather data reveal? Analyzing weather data can reveal patterns.	5–8 days	K.2C, K.2D, K.3B, K.3C, K.7C, K.8A, K.8B ELPS: 3F, 3H, 4A, 4E
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.	6–8 days	K.2A, K.2D, K.3B, K.3C, K.4B, K.7C, K.8A, K.8B, K.8C ELPS: 2E, 2F, 3E, 3J, 4A
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 days	K.3B, K.8A, K.8B, K.8C ELPS: 3E, 3F



Spotlight Lessons on Forces and Motion

Lesson Sets	Recommended Number of Days	TEKS and ELPS Alignment
<p>Lessons 1–2: Location and Motion</p> <p>Phenomenon Question: How can we describe what we observe?</p> <p>People can observe and communicate the location and movement of an object.</p>	<p>2 days</p>	<p>K.2C, K.2D, K.2E, K.6C, K.6D</p> <p>ELPS: 3E</p>
<p>Lessons 3–4: Magnets</p> <p>Phenomenon Question: What happens when magnets get close to different objects?</p> <p>Magnets attract or repel objects with certain properties.</p>	<p>2 days</p>	<p>K.2A, K.2B, K.2C, K.2D, K.2E, K.4A, K.6B</p> <p>ELPS: 3D, 4A</p>













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 five days a week.


Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Module 1			Module 2			Module 3				












Module 1: Weather











Concept 1: What is weather?		11–19 days	
Focus Standards			
<p>K.5A Observe and record properties of objects, including bigger or smaller, heavier or lighter, shape, color, and texture.</p> <p>K.5B Observe, record, and discuss how materials can be changed by heating or cooling.</p> <p>K.6A Use the senses to explore different forms of energy such as light, thermal, and sound.</p> <p>K.7C Give examples of ways rocks, soil, and water are useful.</p> <p>K.8A Observe and describe weather changes from day to day and over seasons.</p> <p>K.8C Observe, describe, and illustrate objects in the sky such as the clouds, Moon, and stars, including the Sun.</p>			
Lessons 1–2: Cliff Dwellings at Mesa Verde		Lesson 3: Local Weather	Lessons 4–7: Describing Weather
Lesson 1: Build a tent to explore the purpose of shelters.		Lesson 2: Develop an anchor model of a Mesa Verde cliff dwelling.	
Lesson 3: Examine and sort photographs of outdoor activities and ask questions about the weather.		Lesson 4: Record observations of cloud cover, rain, and snow.	
 Day 1: Launch Day 2: Learn through Land  Think aloud photograph in Launch.	 Day 1: Launch through Notice and Wonder about Mesa Verde Day 2: Develop Anchor Model through Land  Teach nonverbal signals in Notice and Wonder about Mesa Verde before the lesson.	 Day 1: Launch through Sort Outdoor Activity Cards Day 2: Build Driving Question Board through Land  Use second Teacher Note in Launch.  Think aloud a few questions in Build Driving Question Board.	 Complete drawing activity in Launch before the lesson.  Think aloud partly sunny cards in Describe Cloud Cover, Rain, and Snow.  Use second Teacher Note in Describe Cloud Cover, Rain, and Snow.




Concept 1: What is weather? (continued)			
Lessons 4–7: Describing Weather			Lessons 8–9: Effects of Weather
Lesson 5: Learn how to use a thermometer to measure temperature.	Lesson 6: Design a tool to measure the wind.	Lesson 7: Create, improve, and share a wind-measuring tool.	Lesson 8: Model the effects of sunlight, wind, and rain on playground materials.
 Day 1: Launch through Explore Thermometers Day 2: Act Like a Thermometer through Land	 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.	 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.	 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.
Lessons 8–9: Effects of Weather	Lessons 10–11: Parts of Weather		
Lesson 9: Investigate temperature differences between areas in sunlight and areas in shade.	Lesson 10: Recognize that different homes are shelters that can protect people from the weather.	Lesson 11: Describe how the cliff dwellings at Mesa Verde protected people from the weather.	
 Use an alternative collaborative conversation routine in Ask Questions about Sunlight, Shade, and Temperature.  Use first Teacher Note in Investigate Sunlight, Shade, and Temperature.	 Think aloud one prepared shelter poster in Make a Poster.  Use Differentiation note in Make a Poster.	 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	

Engineering Challenge: How can we help archaeologists feel cooler when they work?				5 days
Focus Standards				
K.5A Observe and record properties of objects, including bigger or smaller, heavier or lighter, shape, color, and texture.				
K.5B Observe, record, and discuss how materials can be changed by heating or cooling.				
K.6A Use the senses to explore different forms of energy such as light, thermal, and sound.				
Lessons 12–16: Engineering Challenge				
Lesson 12: Apply the engineering design process to create a shelter that helps archaeologists feel cooler when they are working in the sunlight.	Lesson 13: Apply the engineering design process to create a shelter that helps archaeologists feel cooler when they are working in the sunlight.	Lesson 14: Apply the engineering design process to create a shelter that helps archaeologists feel cooler when they are working in the sunlight.	Lesson 15: Apply the engineering design process to create a shelter that helps archaeologists feel cooler when they are working in the sunlight.	
Engineering Challenge	 Use Teacher Note in Imagine a Shelter. Engineering Challenge	Engineering Challenge	Engineering Challenge	
Lessons 12–16: 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.				
Engineering Challenge				







<p>Concept 2: What does weather data reveal? 5–8 days</p> <p>Focus Standards</p> <p>K.7C Give examples of ways rocks, soil, and water are useful.</p> <p>K.8A Observe and describe weather changes from day to day and over seasons.</p> <p>K.8B Identify events that have repeating patterns, including seasons of the year and day and night.</p>			
<p>Lessons 17–20: Local Weather Data</p>			
<p>Lesson 17: Use weather data to identify and describe patterns in daily temperature changes.</p>	<p>Lesson 18: Summarize monthly temperature data.</p>	<p>Lesson 19: Summarize monthly weather data.</p>	<p>Lesson 20: Explore how meteorologists predict weather and develop weather forecasts.</p>
<p> Think aloud the first day on the temperature chart in Analyze Daily Temperature Data.</p>	<p> Think aloud sentence frames in Analyze Monthly Temperature Data.</p>	<p> Day 1: Launch through Analyze Monthly Weather Data (cloud cover)</p> <p>Day 2: Analyze Monthly Weather Data (rain, snow, and wind) through Land</p> <p> Think aloud the first half of the weather log in Analyze Monthly Weather Data.</p>	<p> Day 1: Launch through Share a Weather Forecast</p> <p>Day 2: Share a Weather Forecast (continued) through Land</p> <p> Think aloud one weather forecast in Share a Weather Forecast.</p> <p> Finish group presentations after the lesson.</p>
<p>Lesson 21: Weather Data</p>			
<p>Lesson 21: Use data to describe daily temperature patterns at Mesa Verde.</p>			
<p> Day 1: Launch through Conceptual Checkpoint Part A</p> <p>Day 2: Conceptual Checkpoint B through Land</p> <p> Think aloud an unanswered question on driving question board in the Land.</p> <p>Conceptual Checkpoint</p>			

Concept 3: How does severe weather affect us?			6–8 days
Focus Standards			
K.7C Give examples of ways rocks, soil, and water are useful.			
K.8A Observe and describe weather changes from day to day and over seasons.			
K.8B Identify events that have repeating patterns, including seasons of the year and day and night.			
K.8C Observe, describe, and illustrate objects in the sky such as the clouds, Moon, and stars, including the Sun.			
Lessons 22–24: Effects of Severe Weather			Lessons 25–26: Preparing for Severe Weather
Lesson 22: Observe and record information about different kinds of severe weather.	Lesson 23: Share information about different kinds of severe weather.	Lesson 24: Describe how severe weather affects communities.	Lesson 25: Use data to identify and describe severe weather patterns.
 Day 1: Launch through Observe Hurricanes, Tornadoes, and Blizzards (group drawings) Day 2: Observe Hurricanes, Tornadoes, and Blizzards (weather videos) through Land  Use third Teacher Note in Observe Thunderstorms.  Share severe weather videos in Observe Hurricanes, Tornadoes, and Blizzards.	 Practice acting out severe weather in Launch before the lesson.	 Think aloud photograph of severe weather in Observe 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.	 Sort the severe weather cards from Analyze Severe Weather Data before the lesson.  Think aloud similarities and differences in Identify and Describe Severe Weather Patterns.  Focus on data for Houston, Texas, in Identify and Describe Severe Weather Patterns.

Concept 3: How does severe weather affect us? (continued)	
Lessons 25–26: Preparing for Severe Weather	Lesson 27: Severe Weather
Lesson 26: Describe how communities prepare for and respond to severe weather.	Lesson 27: Describe how severe weather may have affected the Ancestral Pueblo people at Mesa Verde.
 Use an alternative collaborative conversation routine in Obtain Information about Severe Weather Preparation.	 Day 1: Launch through Conceptual Checkpoint Day 2: Debrief Conceptual Checkpoint and Update Anchor Model through Land
 Review school’s severe weather response plan in Land after the lesson.	Conceptual Checkpoint

Application of Concepts: How did the cliff dwellings at Mesa Verde protect people from the weather?		3 days
Focus Standards		
K.8A Observe and describe weather changes from day to day and over seasons.		
K.8B Identify events that have repeating patterns, including seasons of the year and day and night.		
K.8C Observe, describe, and illustrate objects in the sky such as the clouds, Moon, and stars, including the Sun.		
Lessons 28–30: Cliff Dwellings at Mesa Verde		
Lesson 28: Explain how the cliff dwellings at Mesa Verde protected people from the weather.	Lesson 29: Describe the weather during the Blizzard of 1978 in Boston, and explain how the storm affected people there.	Lesson 30: Explain how the weather affects people and their surroundings.
Socratic Seminar	End-of-Module Assessment	End-of-Module Debrief

Spotlight Lessons: Forces and Motion

Focus Standards		4 days	
<p>K.6B Explore interactions between magnets and various materials.</p> <p>K.6C Observe and describe the location of an object in relation to another such as above, below, behind, in front of, and beside.</p> <p>K.6D Observe and describe the ways that objects can move such as in a straight line, zigzag, up and down, back and forth, round and round, and fast and slow.</p>			
Lessons 1–2: Location and Motion		Lessons 3–4: Magnets	
Lesson 1: Observe and describe the location of one object in relation to another.	Lesson 2: Observe and describe ways that objects can move.	Lesson 3: Observe and describe what happens when magnets get close to various objects.	Lesson 4: Observe and describe what happens when magnets get close to other magnets.
	 Use inline Teacher Note in Visit Video Stations.  Pre-format column headings on class chart in Discuss Station Observations.	 Think aloud two of the objects in magnet and objects investigation in Observe How Magnets Interact with Objects.	 Use Spotlight on Knowledge and Skills note in Observe How Magnets Interact.

Texas Essential Knowledge and Skills (TEKS)

Focus Standards

- K.5 Matter and energy. The student knows that objects have properties and patterns. The student is expected to
- K.5A** observe and record properties of objects, including bigger or smaller, heavier or lighter, shape, color, and texture; and
 - K.5B** observe, record, and discuss how materials can be changed by heating or cooling.
- K.6 Force, motion, and energy. The student knows that energy, force, and motion are related and are a part of their everyday life. The student is expected to
- K.6A** use the senses to explore different forms of energy such as light, thermal, and sound.
 - K.6B** Explore interactions between magnets and various materials.
 - K.6C** Observe and describe the location of an object in relation to another such as above, below, behind, in front of, and beside.
 - K.6D** Observe and describe the ways that objects can move such as in a straight line, zigzag, up and down, back and forth, round and round, and fast and slow.
- K.7 Earth and space. The student knows that the natural world includes earth materials. The student is expected to
- K.7C** give examples of ways rocks, soil, and water are useful.
- K.8 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.8A** observe and describe weather changes from day to day and over seasons;
 - K.8B** identify events that have repeating patterns, including seasons of the year and day and night; and
 - K.8C** observe, describe, and illustrate objects in the sky such as the clouds, Moon, and stars, including the Sun.

Investigation and Reasoning Standards

- K.1** Scientific investigation and reasoning. The student conducts classroom and outdoor investigations following home and school safety procedures and uses environmentally appropriate and responsible practices. The student is expected to
- K.1A** identify, discuss, and demonstrate safe and healthy practices as outlined in Texas Education Agency–approved safety standards during classroom and outdoor investigations, including wearing safety goggles or chemical splash goggles, as appropriate, washing hands, and using materials appropriately; and
 - K.1B** demonstrate how to use, conserve, and dispose of natural resources and materials such as conserving water and reusing or recycling paper, plastic, and metal.
- K.2** Scientific investigation and reasoning. The student develops abilities to ask questions and seek answers in classroom and outdoor investigations. The student is expected to
- K.2A** ask questions about organisms, objects, and events observed in the natural world;
 - K.2B** plan and conduct simple descriptive investigations;
 - K.2C** collect data and make observations using simple tools;
 - K.2D** record and organize data and observations using pictures, numbers, and words; and
 - K.2E** communicate observations about simple descriptive investigations.
- K.3** Scientific investigation and reasoning. The student knows that information and critical thinking are used in scientific problem solving. The student is expected to
- K.3A** identify and explain a problem such as the impact of littering and propose a solution;
 - K.3B** make predictions based on observable patterns in nature; and
 - K.3C** explore that scientists investigate different things in the natural world and use tools to help in their investigations.
- K.4** Scientific investigation and reasoning. The student uses age-appropriate tools and models to investigate the natural world. The student is expected to
- K.4A** collect information using tools, including computing devices, hand lenses, primary balances, cups, bowls, magnets, collecting nets, and notebooks; timing devices; non-standard measuring items; weather instruments such as demonstration thermometers; and materials to support observations of habitats of organisms such as terrariums and aquariums; and
 - K.4B** use the senses as a tool of observation to identify properties and patterns of organisms, objects, and events in the environment.