Pacing Guide

Level K Module 3

Environments

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 student needs. 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 29 lessons. Even with lesson splits, this module should take no more than 35 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.

Environments

Anchor Phenomenon: Life in a Longleaf Pine Forest Essential Question: Why are gopher tortoises disappearing?	Recommended Number of Days	TEKS and ELPS Alignment
Concept 1 (Lessons 1–10) : Plants, Animals, and Environments **Focus Question:** How do plants and animals change their environment? Plants and animals can change their environment in many ways, and those changes can affect other plants and animals.	10–13 days	K.2A, K.2B, K.2C, K.2D, K.2E, K.3C, K.4A, K.5A, K.7C, K.8C, K.9B ELPS: 1C, 2E, 3E, 3H, 3J, 4E
Concept 2 (Lessons 11–17): Humans and Environments **Focus Question:** How do humans change their environment? Humans can change their environment in many ways through the choices they make.	7–10 days	K.2A, K.2D, K.2E, K.3A, K.3B, K.4B, K.5A, K.7C, K.9B ELPS: 1C, 2E, 3B, 3H
Application of Concepts (Lessons 18–26): Engineering Challenge **Phenomenon Question:** How can we make a flower pot that does not hurt the environment? Humans can use the engineering design process to make objects that do not hurt the environment.	9 days	K.1B, K.2A, K.2B, K.2D, K.2E, K.3A, K.4A, K.4B, K.5A, K.7B, K.7C, K.8A, K.8B, K.9B ELPS: 2E, 3F, 3H, 4A
Application of Concepts (Lessons 27–29): End-of-Module Socratic Seminar, Assessment, and Debrief **Essential Question:** Why are gopher tortoises disappearing? When plants and animals, including humans, interact with their environment to get what they need, they change that environment.	3 days	K.2E, K.3A, K.4B, K.5A, K.7C, K.8A, K.8B, K.9B ELPS: 3E, 3F

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 3: Environments

Concept 1: How do plants and animals change their environment?			10–13 days

Focus Standards

K.5A Observe and record properties of objects, including bigger or smaller, heavier or lighter, shape, color, and texture.

K.7C Give examples of ways rocks, soil, and water are useful.

K.8C Observe, describe, and illustrate objects in the sky such as the clouds, Moon, and stars, including the Sun.

K.9B Examine evidence that living organisms have basic needs such as food, water, and shelter for animals and air, water, nutrients, sunlight, and space for plants.

Lessons 1–2: Longleaf Pine Forests		Lessons 3–5: Sunlight and Shade	
Lesson 1: Record observations of a longleaf pine forest.	**Lesson 2:** Develop a class anchor model to represent gopher tortoises disappearing from a longleaf pine forest.	**Lesson 3:** Develop models of two forest environments.	**Lesson 4:** Investigate how tree spacing affects the amount of sunlight that can reach wiregrass.
	⏱ **Day 1:** Launch through Develop Class Anchor Model **Day 2:** Develop Driving Question Board through Land 🖥 Think aloud observations from previous modules in Launch.		⏱ **Day 1:** Launch through Gather Forest Data (forest with trees close together) **Day 2:** Share Results through Land 📓 Use Teacher Note in Gather Forest Data. ⚗ Prepare class data table in Share Results before the lesson.

Concept 1: How do plants and animals change their environment? (continued)			
Lessons 3–5: Sunlight and Shade	**Lessons 6–7: Gopher Tortoise Shelters**		**Lessons 8–9: Animals in Gopher Tortoise Burrows**
Lesson 5: Evaluate an argument about how tree spacing affects the growth of wiregrass.	**Lesson 6:** Identify parts of the classroom to use as models of gopher tortoise shelters.	**Lesson 7:** Observe and model how gopher tortoises change their environment to get shelter.	**Lesson 8:** Use information from a text to determine how other animals use gopher tortoise burrows.
Use an alternative collaborative conversation routine in Use Evidence to Agree or Disagree.	Use an alternative collaborative conversation routine in Model Gopher Tortoise Shelters. Use a timer to pace students while drawing in Model Gopher Tortoise Shelters.	Use a timer to pace students while drawing in Develop Student Anchor Models. Use Content Area Connection note in Develop Student Anchor Models.	**Day 1:** Launch through Read About Gopher Tortoise Burrows **Day 2:** Update Student Anchor Models through Land Use Teacher Note in Update Student Anchor Models.

Lessons 8–9: Animals in Gopher Tortoise Burrows	**Lesson 10: Plants, Animals, and Environments**
Lesson 9: Update the class anchor model and the anchor chart.	**Lesson 10:** Analyze notebook entries to explain how plants and animals change a garden environment.
	Conceptual Checkpoint

Concept 2: How do humans change their environment?			7–10 days

Focus Standards

K.5A Observe and record properties of objects, including bigger or smaller, heavier or lighter, shape, color, and texture.

K.7C Give examples of ways rocks, soil, and water are useful.

K.9B Examine evidence that living organisms have basic needs such as food, water, and shelter for animals and air, water, nutrients, sunlight, and space for plants.

Lessons 11–13: Effects of Humans Taking Forest Resources			Lessons 14–16: Restoring Longleaf Pine Forests
Lesson 11: Model the effects of humans removing trees from longleaf pine forests.	**Lesson 12:** Model the effects of humans changing longleaf pine forests to pine farms.	**Lesson 13:** Evaluate claims about how pine farms affect gopher tortoises.	**Lesson 14:** Predict and observe how fire affects wiregrass and longleaf pines.
📖 Use Spotlight on Knowledge and Skills note in Sort Plant and Animal Cards.	⏱ **Day 1:** Launch through Model Effects of Pine Farms (sticker model) **Day 2:** Model Effects of Pine Farms (chart in Science Logbook) through Land	🧪 Prepare directions for active listening list in Evaluate Claims About Pine Farms before the lesson. 📖 Use second Differentiation note in Evaluate Claims About Pine Farms. 👥 Use alternative collaborative conversation routine in Evaluate Claims About Pine Farms.	📖 Use first Teacher Note in Predict Effects of Fire.

Concept 2: How do humans change their environment? (continued)		
Lessons 14–16: Restoring Longleaf Pine Forests		**Lesson 17: Humans and Environments**
Lesson 15: Compare forests that burn often with forests that burn less often to determine how fire can help some plants and animals.	**Lesson 16:** Record and share ideas about how humans can restore longleaf pine forests.	**Lesson 17:** Use knowledge of how humans change longleaf pine forests to explain how humans change their environment when they make a garden.
🕑 **Day 1:** Launch through Compare Forest Environments **Day 2:** Model How Fire Helps Animals through Land	📖 Use Differentiation note in Explore Ways to Restore Longleaf Pine Forests.	🕑 **Day 1:** Launch through Conceptual Checkpoint Part B **Day 2:** Debrief Conceptual Checkpoint through Land
		Conceptual Checkpoint

Engineering Challenge: How can we make a flower pot that does not hurt the environment?			9 days
Focus Standards			
K.5A Observe and record properties of objects, including bigger or smaller, heavier or lighter, shape, color, and texture.			
K.7B Observe and describe physical properties of natural sources of water, including color and clarity.			
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.9B Examine evidence that living organisms have basic needs such as food, water, and shelter for animals and air, water, nutrients, sunlight, and space for plants.			
Lessons 18–19: Preparation for Engineering Challenge (The Problem with Trash)		**Lessons 20–24: Engineering Challenge**	
Lesson 18: Use text and photographs to determine how trash changes land, water, air, and life.	**Lesson 19:** Explore how humans recycle objects and how recycling helps the environment.	**Lesson 20:** Apply the engineering design process to make a flower pot from paper.	**Lesson 21:** Apply the engineering design process to make a flower pot from paper.
	📚 Use Teacher Note in Launch	📚 Use second Teacher Note in Set Up Problem and Solution Chart.	⚙ Use Jigsaw routine for paper shaping test in Imagine Paper Flower Pots.
		Engineering Challenge	**Engineering Challenge**

Engineering Challenge: How can we make a flower pot that does not hurt the environment? (continued)			
Lessons 20–24: Engineering Challenge			Lessons 25–26: Post-Engineering Challenge (Long-Term Local Weather)
Lesson 22: Apply the engineering design process to make a flower pot from paper.	**Lesson 23:** Apply the engineering design process to make a flower pot from paper.	**Lesson 24:** Apply the engineering design process to make a flower pot from paper.	**Lesson 25:** Analyze weather data to determine when to grow sunflowers outside.
Engineering Challenge	Use Differentiation note in Create Flower Pots. **Engineering Challenge**	**Engineering Challenge**	Use an alternative collaborative conversation routine in Analyze and Interpret Long-Term Weather Data.
Lessons 25–26: Post-Engineering Challenge (Long-Term Local Weather)			
Lesson 26: Analyze weather data to identify patterns in seasonal weather changes.			

Application of Concepts: Why are gopher tortoises disappearing?		3 days

Focus Standards

K.5A	Observe and record properties of objects, including bigger or smaller, heavier or lighter, shape, color, and texture.
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.9B	Examine evidence that living organisms have basic needs such as food, water, and shelter for animals and air, water, nutrients, sunlight, and space for plants.

Lessons 27–29: Life in a Longleaf Pine Forest		
Lesson 27: Explain how plants, animals, and humans can change the longleaf pine forest environment.	**Lesson 28:** Explain how plants, animals, and humans can change the environment at Joshua Tree National Park.	**Lesson 29:** Explain how plants, animals, and humans can change their environment.
📖 Use Teacher Note in Engage in Socratic Seminar. **Socratic Seminar**	**End-of-Module Assessment**	**End-of-Module Debrief**

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.
K.7   Earth and space. The student knows that the natural world includes earth materials. The student is expected to
K.7B   observe and describe physical properties of natural sources of water, including color and clarity; and
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.
K.9   Organisms and environments. The student knows that plants and animals have basic needs and depend on the living and nonliving things around them for survival. The student is expected to
K.9B   examine evidence that living organisms have basic needs such as food, water, and shelter for animals and air, water, nutrients, sunlight, and space for plants.

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.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.