# Pacing Guide

Level 1 Module 1

Survival with Spotlight Lessons on Forces and Motion

Each *PhD Science® TEKS Edition* Level 1 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
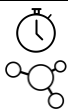
Lesson Split: This symbol identifies single lessons teachers may split across 2 days.

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 31 lessons and 4 spotlight lessons about Forces and Energy. Even with lesson splits, this module should take no more than 53 days to complete. This maximum number of days ensures the implementation of all Level 1 modules within a school year that has 150 days of science instruction.

Survival

Anchor Phenomenon: Life at a Pond Essential Question: How do pond plants and pond animals survive in their environment?	Recommended Number of Days	TEKS and ELPS Alignment
Concept 1 (Lessons 1–10): Body Parts **Focus Question:** How do plants and animals use their body parts to survive in their environment? Plants and animals use their body parts in ways that help the plants and animals survive. Plant and animal body parts have properties that relate to their functions.	10–18 days	1.2A, 1.2E, 1.4A, 1.9A, 1.10A, 1.10B ELPS: 2E, 3D, 3E, 3H, 4A, 4C
Application of Concepts (Lessons 11–16): Engineering Challenge **Phenomenon Question:** How can we help protect scientists at a pond? Humans can solve some problems by mimicking how pond plants and pond animals use their body parts.	6–10 days	1.2A, 1.2B, 1.2C, 1.2D, 1.2E, 1.3A, 1.4A, 1.5A, 1.10A, 1.10B ELPS: 1C, 3E, 3G, 5G
Concept 2 (Lessons 17–22): Sense and Response **Focus Question:** How do plants and animals respond to their environment? Animals have body parts that capture and convey information in the animals' environment. Plants and animals respond to their environment in ways that help the plants and animals survive.	6–9 days	1.2A, 1.2B, 1.2C, 1.2D, 1.2E, 1.3B, 1.4A, 1.9B, 1.9C, 1.10A, 1.10B ELPS: 2F, 3E, 3G, 4A, 4C
Concept 3 (Lessons 23–28): Parents and Offspring **Focus Question:** How do parents help their offspring survive? Individual plants or animals of the same kind are recognizable as similar, but they can also vary in many ways. Many animal parents engage in behaviors that help their offspring survive.	6–9 days	1.2E, 1.3B, 1.4A, 1.4B, 1.9C, 1.10C, 1.10D ELPS: 1C, 2E, 3E, 3F
Application of Concepts (Lessons 29–31): End-of-Module Socratic Seminar, Assessment, and Debrief **Essential Question:** How do pond plants and pond animals survive in their environment? Plants and animals have body parts that function in ways that help the plants and animals survive in their environment. Many animal parents and offspring engage in behaviors that help the offspring survive.	3 days	1.2E, 1.10A, 1.10B ELPS: 3E, 3F

Spotlight Lessons on Forces and Motion

Lesson Sets	Recommended Number of Days	TEKS and ELPS Alignment
Lessons 1–2: Motion **Phenomenon Question:** What are some ways that objects can move?	2 days	1.2C, 1.2D, 1.2E, 1.4A, 1.6C ELPS: 3E
Lessons 3–4: Magnets **Phenomenon Question:** What are some ways that magnets interact with objects?	2 days	1.2A, 1.2B, 1.2C, 1.2E, 1.4A, 1.5A, 1.6B ELPS: 3E, 4A

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: Survival

Concept 1: How do plants and animals use their body parts to survive in their environment?			10–18 days

Focus Standards

1.9A Sort and classify living and nonliving things based upon whether they have basic needs and produce offspring.

1.10A Investigate how the external characteristics of an animal are related to where it lives, how it moves, and what it eats.

1.10B Identify and compare the parts of plants.

| Lessons 1–4: Life at a Pond			
Lesson 1: Observe the different parts of a pond environment.	**Lesson 2:** Observe photographs to determine that living things have needs and produce offspring.	**Lesson 3:** Observe and sort photographs to identify patterns in plant and animal body parts.	**Lesson 4:** Begin a class model to show how plants and animals survive in a pond environment.
Day 1: Launch through Discuss Pond Environments **Day 2:** Make Observations Through Reading through Land Use first Teacher Note in Launch.	**Day 1:** Launch through Analyze Photographs of Living Things **Day 2:** Classify Living and Nonliving Things through Land	**Day 1:** Launch through Learn **Day 2:** Land Think aloud animal body part cards in Sort Animal Body Part Cards.	**Day 1:** Launch through Develop Initial Models **Day 2:** Develop Anchor Model through Land

Concept 1: How do plants and animals use their body parts to survive in their environment? (continued)

Lessons 5–7: Animal Body Parts			Lessons 8–9: Plant Body Parts
Lesson 5: Use models, observe photographs, and view videos to describe the ways animals use their body parts.	**Lesson 6:** Observe animal body parts to describe the relationship between the properties of animal body parts and their functions.	**Lesson 7:** Explain that animal body parts work together to help the animals survive in a pond environment.	**Lesson 8:** Use a model to observe roots, stems, and leaves and to identify their functions.
⏱ **Day 1:** Launch through Visit Animal Body Part Stations (one station) **Day 2:** Visit Animal Body Part Stations (continued) through Land 🖥 Think aloud one station in Visit Animal Body Part Stations. 📖 Use inline Teacher Note in Launch.	🖥 Think aloud one station in Visit Protective Animal Body Part Stations. 📖 Use Differentiation note in Visit Protective Animal Body Part Stations.	⏱ **Day 1:** Launch through Observe Porcupine Body Parts **Day 2:** Observe Crayfish Body Parts through Land	⏱ **Day 1:** Launch through Model Leaf Function **Day 2:** Model Root and Stem Functions through Land ⚗ Preassemble plant models in soil or gravel in Model Leaf Function.

Lessons 8–9 Plant Body Parts	Lesson 10 Body Parts
Lesson 9 Observe plant body parts to describe the relationship between the properties of plant body parts and their functions.	**Lesson 10** Describe how a yellowjacket uses its body parts to help it survive.
⏱ **Day 1:** Launch through Visit Protective Plant Body Part Stations **Day 2:** Explain Plant Body Part Functions through Land	**Conceptual Checkpoint**

Engineering Challenge: How can we help protect scientists at a pond?			6–10 days
Focus Standards			
1.5A	Classify objects by observable properties such as larger and smaller, heavier or lighter, shape, color, and texture.		
1.10A	Investigate how the external characteristics of an animal are related to where it lives, how it moves, and what it eats.		
1.10B	Identify and compare the parts of plants.		
Lesson 11: Preparation for Engineering Challenge (Mimicry)	**Lessons 12–16: Engineering Challenge**		
Lesson 11: Examine two human-made products that mimic how plants and animals use their body parts.	**Lesson 12:** Apply the engineering design process to create a covering that protects scientists at a pond.	**Lesson 13:** Apply the engineering design process to create a covering that protects scientists at a pond.	**Lesson 14:** Apply the engineering design process to create a covering that protects scientists at a pond.
⏱ **Day 1:** Launch through Observe a Plant Body Part **Day 2:** Describe Different Fasteners through Land	⏱ **Day 1:** Launch through Ask About an Engineering Problem (individual drawings) **Day 2:** Ask About an Engineering Problem (group drawing) through Land	⏱ **Day 1:** Launch through Imagine a Protective Covering **Day 2:** Plan a Protective Covering through Land	⚗ Preassemble the printer and carbon paper in preparation for students to test in Create a Protective Covering.
👥 Use a timer to pace the drawing of each fastener in Describe Different Fasteners.		👥 Use an alternative collaborative conversation routine in Imagine a Protective Covering.	📚 Use Differentiation note in Create a Protective Covering.
Engineering Challenge	**Engineering Challenge**	**Engineering Challenge**	**Engineering Challenge**

Engineering Challenge: How can we help protect scientists at a pond? (continued)	
Lessons 12–16: Engineering Challenge	
Lesson 15: Apply the engineering design process to create a covering that protects scientists at a pond.	**Lesson 16:** Apply the engineering design process to create a covering that protects scientists at a pond.
Day 1: Launch through Improve a Protective Covering (make improvements) **Day 2:** Improve a Protective Covering (make improvements continued) through Land Use second Differentiation note in Brainstorm Improvements.	Finish Share a Protective Covering presentations after the lesson.
Engineering Challenge	**Engineering Challenge**

Concept 2: How do plants and animals respond to their environment?			6–9 days

Focus Standards

1.9B Analyze and record examples of interdependence found in various situations such as terrariums and aquariums or pet and caregiver.

1.9C Gather evidence of interdependence among living organisms such as energy transfer through food chains or animals using plants for shelter.

1.10A Investigate how the external characteristics of an animal are related to where it lives, how it moves, and what it eats.

1.10B Identify and compare the parts of plants.

Lessons 17–18: Animal Responses		Lesson 19: Animal Communication	Lessons 20–21: Plant Responses
Lesson 17: Make observations from videos to gather evidence that animals sense information in their environment.	**Lesson 18:** Make observations firsthand or from media to explain that animals use their body parts to sense information.	**Lesson 19:** Analyze information from a modeling activity, videos, and a text to conclude that animals communicate to help themselves and others survive.	**Lesson 20:** Plan and conduct an investigation to test whether plants respond to light.
Day 1: Launch through Observe Animal Responses (video stations) **Day 2:** Observe Animal Responses (video stations continued) through Land Think aloud one station in Observe Animal Responses. Use inline Teacher Note in Observe Animal Responses.	Use an alternative collaborative conversation routine in Observe Sensing in Videos.	**Day 1:** Launch through Learn **Day 2:** Land Use an alternative collaborative conversation routine in Land.	Finish predictions in Make Predictions after the lesson. Use Teacher Note in Make Predictions.

Concept 2: How do plants and animals respond to their environment? (continued)	
Lessons 20–21: Plant Responses	**Lesson 22: Sense and Response**
Lesson 21: Analyze data and observe photographs to notice the pattern that some plants respond to light in their environment.	**Lesson 22:** Make observations from photographs to notice the pattern that the leaves of a mimosa plant close in response to touch.
🕐 **Day 1:** Launch through Analyze Investigation Data **Day 2:** Analyze Plant Photographs through Land 📖 Use first Teacher Note in Analyze Plant Photographs.	**Conceptual Checkpoint**

Concept 3: How do parents help their offspring survive?			6–9 days

Focus Standards

1.9C	Gather evidence of interdependence among living organisms such as energy transfer through food chains or animals using plants for shelter.
1.10C	Compare ways that young animals resemble their parents.
1.10D	Observe and record life cycles of animals such as a chicken, frog, or fish.

Lessons 23–25: Plants or Animals of the Same Kind			Lessons 26–27: Parent and Offspring Behaviors
Lesson 23: Observe similarities and differences between plants or animals of the same kind.	**Lesson 24:** Use evidence to explain that young plants and animals look very much, but not exactly, like their parents.	**Lesson 25**: Arrange photographs to determine that animals' life cycles include birth, growth, adulthood, and reproduction.	**Lesson 26:** Use information from storyboards to explain that many, but not all, animal parents engage in behaviors that help their offspring survive.
Day 1: Launch through Observe Similarities Between Plants or Animals of the Same Kind **Day 2:** Observe Differences Between Plants or Animals of the Same Kind though Land	Use an alternative collaborative conversation routine in Match a Plant Parent and Offspring.	Pre-trim trout and moose life cycle cards to prepare for placement in science logbooks in Create Life Cycle Model.	**Day 1:** Launch through Analyze Storyboards **Day 2:** Sort Storyboards through Land
Use first Teacher Note in Observe Similarities Between Plants or Animals of the Same Kind.	Use Differentiation note in Match a Plant Parent and Offspring.		Think aloud robin storyboard in Analyze Storyboards.

Lessons 26–27: Parent and Offspring Behaviors	Lesson 28: Parents and Offspring
Lesson 27: Describe animal parent and offspring behaviors that help the offspring survive.	**Lesson 28:** Use observations of parents and offspring as evidence that offspring are very much, but not exactly, like their parents and that parents engage in behaviors that help their offspring survive.
🕐 **Day 1:** Launch through Analyze Storyboards **Day 2:** Act Out Parent and Offspring Behaviors through Land 📓 Use second Teacher Note in Analyze Storyboards. ⚛ Complete Act Out Parent and Offspring Behaviors performances after the lesson.	**Conceptual Checkpoint**

Application of Concepts: How do pond plants and pond animals survive in their environment?		3 days
Focus Standards		
1.10A Investigate how the external characteristics of an animal are related to where it lives, how it moves, and what it eats.		
1.10B Identify and compare the parts of plants.		

Lessons 29–31: Life at a Pond		
Lesson 29: Explain the ways plants and animals survive in a pond environment.	**Lesson 30:** Explain the ways a koala survives in a forest environment.	**Lesson 31:** Explain the ways plants and animals survive in their environment.
📓 Use Teacher Note in Engage in Socratic Seminar. **Socratic Seminar**	**End-of-Module Assessment**	**End-of-Module Debrief**

Spotlight Lessons: Force and Motion

Focus Standards			4 days
1.5A Classify objects by observable properties such as larger and smaller, heavier and lighter, shape, color, and texture.			
1.6B Predict and describe how a magnet can be used to push or pull an object.			
1.6C 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.			
Lessons 1–2: Motion		**Lessons 3–4: Magnets**	
Lesson 1: Observe and record the different ways objects can move.	**Lesson 2:** Demonstrate the different ways objects can move.	**Lesson 3:** Observe and describe some ways that magnets interact with different objects.	**Lesson 4:** Observe and describe some ways that magnets interact with other magnets.
Use Teacher Note in Visit Video Stations. Think aloud one station in Visit Video Stations. Use first Teacher Note in Discuss Observations.	Use an alternative collaborative conversation routine in Land.		Use second Teacher Note in Explore Interactions Between Magnets.

Texas Essential Knowledge and Skills (TEKS)

Focus Standards
1.9   Organisms and environments. The student knows that the living environment is composed of relationships between organisms and the life cycles that occur. The student is expected to: **1.9A**   sort and classify living and nonliving things based upon whether they have basic needs and produce offspring; **1.9B**   analyze and record examples of interdependence found in various situations such as terrariums and aquariums or pet and caregiver; and **1.9C**   gather evidence of interdependence among living organisms such as energy transfer through food chains or animals using plants for shelter. 1.10   Organisms and environments. The student knows that organisms resemble their parents and have structures and processes that help them survive within their environments. The student is expected to **1.10A** identify how the external characteristics of an animal are related to where it lives, how it moves, and what it eats; **1.10B** identify and compare the parts of plants; **1.10C** compare ways that young animals resemble their parents; and **1.10D** observe and record life cycles of animals such as a chicken, frog, or fish.

Investigation and Reasoning Standards

1.2	Scientific investigation and reasoning. The student develops abilities to ask questions and seek answers in classroom and outdoor investigations. The student is expected to
	1.2A ask questions about organisms, objects, and events observed in the natural world;
	1.2B plan and conduct simple descriptive investigations;
	1.2C collect data and make observations using simple tools;
	1.2D record and organize data using pictures, numbers, and words; and
	1.2E communicate observations and provide reasons for explanations using student-generated data from simple descriptive investigations.
1.3	Scientific investigation and reasoning. The student knows that information and critical thinking are used in scientific problem solving. The student is expected to
	1.3A identify and explain a problem and propose a solution; and
	1.3B make predictions based on observable patterns.
1.4	Scientific investigation and reasoning. The student uses age-appropriate tools and models to investigate the natural world. The student is expected to
	1.4A collect, record, and compare information using tools, including computers, hand lenses, primary balances, cups, bowls, magnets, collecting nets, notebooks, and safety goggles or chemical splash goggles, as appropriate; timing devices; non-standard measuring items; weather instruments such as demonstration thermometers and wind socks; and materials to support observations of habitats of organisms such as aquariums and terrariums; and
	1.4B measure and compare organisms and objects using non-standard units.