



Teaching and Learning

Louisiana Guide to Implementing Great Minds PhD Science: Grade 4

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Purpose

To assist teachers with implementing the PhD Science curriculum for grade 4, this document provides guidance for how PhD Science units correlate with the [Louisiana Student Standards for Science](#) (LSSS). The PhD Science curriculum provides ample instructional guidance for teachers. This Louisiana Guide to Implementing Great Minds PhD Science goes a step further to point out places in which teachers may need to make strategic decisions, considering student needs.

The PhD Science Grade 3 units are intentionally designed to provide students the opportunity to incrementally make sense of phenomena to build understanding and abilities over time through a coherent storyline. Modification to the sequence or content of lessons within these units could undermine the design and, therefore, should be approached with caution and careful consideration.

This guidance document is considered a 'living' document, reflecting the expectation that teachers and other educators will continue to identify opportunities for improvement as it is applied in practice. Please send feedback to STEM@la.gov so that LDOE may incorporate your suggestions when updating this guide.

Standards by Module¹

	Module 1 Earth Features	Module 2 Energy	Module 3 Sense and Response	Module 4 Light
Approximate Time Frame	27 days	26 days	31 days	27 days
Anchor Phenomenon	Formation of the Grand Canyon's features	Windmills at work	Elephants sensing distant rainstorms	Visibility and communication to Howland Island
Essential Question	How did the Grand Canyon's features form?	How do windmills change wind to light?	How do elephants sense rainstorms from more than 100 miles away?	Why didn't Amelia Earhart complete her journey?
Instructional Texts	<i>The Grand Canyon Who were the Wright Brothers</i>	<i>The Boy Who Harnessed the Wind</i>	<i>The Elephant Scientist</i>	<i>Amelia Lost: The Life and Disappearance of Amelia Earhart</i>
Standards	4-ESS1-1 4-ESS2-1 4-ESS2-2 4-ESS3-1 4-ESS3-2	4-PS3-1 4-PS3-2 4-PS3-3 4-PS3-4	4-LS1-1 4-LS1-2 4-PS4-1	4-PS4-2

Standard 4-ESS2-3 is partially addressed throughout the Grade 4 modules.

¹Adapted from guidance developed by PhD Science

Concept Focus by Module¹

Module	Concept Focus Questions
Module 1 Earth's Features	<p>Concept 1: What do Earth's rock layers reveal?</p> <p>Concept 2: How are Earth's rock layers uncovered?</p> <p>Engineering Challenge: How can people reduce damage related to erosion?</p> <p>Concept 3: How do canyons around the world form?</p> <p>Concept 4: How do humans interact with Earth's features and processes?</p> <p>Application of Concept</p>
Module 2 Energy	<p>Concept 1: What is energy?</p> <p>Concept 2: How does energy transfer from place to place?</p> <p>Concept 3: How does energy transform?</p> <p>Engineering Challenge: How can we apply our knowledge of energy to solve a problem?</p> <p>Application of Concepts</p>
Module 3 Sense and Response	<p>Concept 1: How do animals receive information about their environment?</p> <p>Concept 2: How does information move across a distance?</p> <p>Science Challenge: How can elephants interpret information from the vibrations they feel?</p> <p>Concept 3: How do animals respond to information about their environments?</p> <p>Research project: How do plants respond to their environment?</p> <p>Application of Concepts</p>
Module 4 Light	<p>Concept 1: How does light affect what we see?</p> <p>Concept 2: How do an object's physical properties affect how we see it?</p> <p>Engineering Challenge: How can you make Howland Island and the runway easier to find?</p> <p>Concept 3: How can we communicate effectively across a distance?</p> <p>Application of Concepts</p>

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LDOE Formative Assessment Resources

LDOE formative assessment resources include a library of Louisiana educator-created discrete items and sets, LEAP Practice Test Items, and LEAP Assessment Guide Items correlated to the Louisiana Student Standards for Science. These resources can be used alongside guidance from a high-quality curriculum to provide opportunities for students to showcase their learning.

Module	Discrete Items	Sets
Module 1 Earth Features	<p><u>LDOE Formative Assessment Items</u> (Password - Educate2020):</p> <ul style="list-style-type: none"> LA Coast, Grand Canyon, Dam (4-ESS2-1) Wind Power (4-ESS3-1) Ashfall (4-ESS3-2) <p><u>LEAP Practice Test Standalone Items:</u></p> <ul style="list-style-type: none"> 32 & 41 (4-ESS1-1) 33 (4-ESS2-1) 15 & 34 (4-ESS2-2) 14 (4-ESS3-2) <p><u>LEAP Assessment Guide Items:</u></p> <ul style="list-style-type: none"> Erosion Experiment (4-ESS2-1) <p><u>LEAP Science Released Items:</u></p> <ul style="list-style-type: none"> Rock Layers (4-ESS1-1) House on Sliders (4-ESS3-2) 	<p><u>LDOE Formative Assessment Sets</u> (Password - Educate2020):</p> <ul style="list-style-type: none"> Item Set: Sierra Nevada (4-ESS1-1 and 4-ESS2-2) <p><u>LEAP Practice Test Standalone Sets:</u></p> <ul style="list-style-type: none"> Item Set: Hawaiian Volcanoes (4-ESS2-2 and 4-ESS3-2) <p><u>LEAP Assessment Guide Sets:</u></p> <ul style="list-style-type: none"> Task Set: The Ages of Louisiana Soil and Fossils (4-ESS1-1 and 4-ESS2-1) <p><u>LEAP Science Released Items:</u></p> <ul style="list-style-type: none"> Item Set: Bryce Canyon (4-ESS1-1 and 4-ESS2-1)
Module 2 Energy	<p><u>LDOE Formative Assessment Items</u> (Password - Educate2020):</p> <ul style="list-style-type: none"> Hockey Puck (4-PS3-1) Pool Temperature (4-PS3-2) Marbles (4-PS3-3) Boat Design (4-PS3-4) 	<p><u>LDOE Formative Assessment Sets</u> (Password - Educate2020):</p> <ul style="list-style-type: none"> N/A <p><u>LEAP Practice Test Standalone Sets:</u></p> <ul style="list-style-type: none"> Item Set: Heating with Solar Energy (4-PS3-4 and 4-ESS3-1) Item Set: Marble Experiment (4-PS3-1 and 4-PS3-3)

Module	Discrete Items	Sets
Module 2 continued	<p><u>LEAP Practice Test Standalone Items:</u></p> <ul style="list-style-type: none"> • 39 (4-PS3-1) • 22-23 (4-PS3-4) <p><u>LEAP Assessment Guide Items:</u></p> <ul style="list-style-type: none"> • Blender (4-PS3-2) • Softball (4-PS3-3) <p><u>LEAP Science Released Items:</u></p> <ul style="list-style-type: none"> • Solar Panels (4-PS3-4) 	<ul style="list-style-type: none"> • Item Set: Striking Flint (4-PS3-3 and 4-PS3-2) <p><u>LEAP Assessment Guide Sets:</u></p> <ul style="list-style-type: none"> • N/A <p><u>LEAP Science Released Items:</u></p> <ul style="list-style-type: none"> • N/A
Module 3 Sense and Response	<p><u>LDOE Formative Assessment Items (Password - Educate2020):</u></p> <ul style="list-style-type: none"> • Green Pitcher (4-LS1-1) • Puddles (4-PS4-1) • Spiders (4-LS1-2) <p><u>LEAP Practice Test Standalone Items:</u></p> <ul style="list-style-type: none"> • N/A <p><u>LEAP Assessment Guide Items:</u></p> <ul style="list-style-type: none"> • Armadillos (4-LS1-2) <p><u>LEAP Science Released Items:</u></p> <ul style="list-style-type: none"> • N/A 	<p><u>LDOE Formative Assessment Sets (Password - Educate2020):</u></p> <ul style="list-style-type: none"> • Item Set: Hurricanes (4-ESS2-1 and 4-PS4-1) • Item Set: Cuttlefish (4-LS1-1 and 4-LS1-2) <p><u>LEAP Practice Test Standalone Sets:</u></p> <ul style="list-style-type: none"> • Task Set: Beavers (4-ESS2-3 and 4-LS1-1) <p><u>LEAP Assessment Guide Sets:</u></p> <ul style="list-style-type: none"> • N/A <p><u>LEAP Science Released Items:</u></p> <ul style="list-style-type: none"> • N/A
Module 4 Light	<p><u>LDOE Formative Assessment Items (Password - Educate2020):</u></p> <ul style="list-style-type: none"> • Cave (4-PS4-2) <p><u>LEAP Practice Test Standalone Items:</u></p> <ul style="list-style-type: none"> • 40 (4-PS4-2) 	<p><u>LDOE Formative Assessment Sets (Password - Educate2020):</u></p> <ul style="list-style-type: none"> • N/A <p><u>LEAP Practice Test Standalone Sets:</u></p> <ul style="list-style-type: none"> • Item Set: Predator and Prey Senses (4-LS1-2 and 4-PS4-2)

Module	Discrete Items	Sets
Module 4 <i>continued</i>	<p><u>LEAP Assessment Guide Items:</u></p> <ul style="list-style-type: none"> N/A <p><u>LEAP Science Released Items:</u></p> <ul style="list-style-type: none"> N/A 	<p><u>LEAP Assessment Guide Sets:</u></p> <ul style="list-style-type: none"> Item Set: How Bears See (4-LS1-2 and 4-PS4-2) <p><u>LEAP Science Released Items:</u></p> <ul style="list-style-type: none"> N/A
Additional Standards	<p><u>LDOE Formative Assessment Items (Password - Educate2020):</u></p> <ul style="list-style-type: none"> Termite (4-ESS2-3) <p><u>LEAP Practice Test Standalone Items:</u></p> <ul style="list-style-type: none"> 37 (4-ESS2-3) <p><u>LEAP Assessment Guide Items:</u></p> <ul style="list-style-type: none"> N/A <p><u>LEAP Science Released Items:</u></p> <ul style="list-style-type: none"> N/A 	<p><u>LDOE Formative Assessment Sets (Password - Educate2020):</u></p> <ul style="list-style-type: none"> Item Set: Blackbirds (4-ESS2-3 and 4-LS1-1*) <p><u>LEAP Practice Test Standalone Sets:</u></p> <ul style="list-style-type: none"> N/A <p><u>LEAP Assessment Guide Sets:</u></p> <ul style="list-style-type: none"> N/A <p><u>LEAP Science Released Items:</u></p> <ul style="list-style-type: none"> Item Set: Water Hyacinths (4-LS1-1 and 4-ESS2-3)