



Teaching and Learning

# Louisiana Guide to Implementing Great Minds PhD Science: Grade 4

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To assist teachers with implementing the PhD Science curriculum for grade 4, this document provides guidance regarding 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 for 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.

This guidance document is considered a “living” document as we believe that teachers and other educators will find ways to improve the document as they use it. Please send feedback to [STEM@la.gov](mailto:STEM@la.gov) so that we may use your input when updating this guide.

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## Standards by Module<sup>1</sup>

	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</i> <i>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.

<sup>1</sup>Adapted from guidance developed by PhD Science

## Concept Focus by Module<sup>1</sup>

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

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## LDOE Formative Assessment Resources

Created by Louisiana educators to support formative assessment in the classroom, the LDOE has released a library of discrete items and item sets correlated to the Louisiana Student Standards for Science. These items, along with LEAP 2025 Practice Test Items, may be used in conjunction with guidance from high-quality curricula as opportunities for students to demonstrate what they have learned. LDOE Formative Assessment Resources can be found on the [K-12 Science Resources](#) web page.

Module	Discrete & Standalone Items	Item Sets and Practice Test Items
Module 1 Earth Features	LA Coast (4-ESS2-1) Grand Canyon (4-ESS2-1) Dam (4-ESS2-1) Wind Power 136574 (4-ESS3-1) Ashfall (4-ESS3-2)  Practice Test Standalone items: <ul style="list-style-type: none"> <li>• 32 &amp; 41 (4-ESS1-1)</li> <li>• 33 (4-ESS2-1)</li> <li>• 15 &amp; 34 (4-ESS2-2)</li> <li>• 14 (4-ESS3-2)</li> </ul>	Practice Test Item Set: <ul style="list-style-type: none"> <li>• Hawaiian Volcanoes (4-ESS2-2 and 4-ESS3-2)</li> </ul> Sierra Nevada (4-ESS1-1 and 4-ESS2-2)
Module 2 Energy	Hockey Puck (4-PS3-1) Pool Temperature (4-PS3-2) Marbles (4-PS3-3) Boat Design (4-PS3-4)  Practice Test Standalone items: <ul style="list-style-type: none"> <li>• 39 (4-PS3-1)</li> <li>• 22-23 (4-PS3-4)</li> </ul>	Practice Item Sets: <ul style="list-style-type: none"> <li>• Heating with Solar Energy (4-PS3-4 and 4-ESS3-1)</li> <li>• Marble Experiment (4-PS3-1 and 4-PS3-3)</li> <li>• Striking Flint (4-PS3-3 and 4-PS3-2)</li> </ul>
Module 3 Sense and	Green Pitcher (4-LS1-1) Puddles (4-PS4-1) Spiders (4-LS1-2)	Practice Item Set: <ul style="list-style-type: none"> <li>• Beavers (4-ESS2-3 and 4-LS1-1)</li> </ul>

Module	Discrete & Standalone Items	Item Sets and Practice Test Items
Response		Hurricanes (4-ESS2-1 and 4-PS4-1) Cuttlefish (4-LS1-1 and 4-LS1-2)
Module 4 Light	Cave (4-PS4-2) Practice Test Standalone items: <ul style="list-style-type: none"> <li>● 40 (4-PS4-2)</li> </ul>	Predator and Prey (4-LS1-2 and 4-PS4-2)
Additional Standards	Termite (4-ESS2-3) Practice Test Standalone item: <ul style="list-style-type: none"> <li>● 37</li> </ul>	Blackbirds (4-ESS2-3 and 4-LS1-1*)