Instructional Materials Evaluation Tool for Alignment in Science Grades K – 12 (IMET)

FULL CURRICULUM
Instructional Materials

Strong science instruction requires that students:

- Apply content knowledge to explain real world phenomena and to design solutions,
- Investigate, evaluate, and reason scientifically, and
- Connect ideas across disciplines.

Title: **PhD Science**

Grade/Course: **4**

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Overall Rating: **Tier I, Exemplifies quality**

Tier I, Tier II, Tier III Elements of this review:

STRONG	WEAK
1. Three-dimensional Learning (Non-Negotiable)	
2. Phenomenon-Based Instruction (Non-Negotiable)	
3. Alignment Accuracy (Non-Negotiable)	
4. Disciplinary Literacy (Non-Negotiable)	
5. Learning Progressions	
6. Scaffolding and Support	
7. Usability	

To evaluate each set of submitted materials for alignment with the standards, begin by reviewing the indicators listed in Column 2 for the non-negotiable criteria. If there is a "Yes" for all required indicators in Column 2, then the materials receive a "Yes" in Column 1. If there is a "No" for any required indicator in Column 2, then the materials receive a "No" in Column 1. Submissions must meet Criteria 1 and 2 for the review to continue to Criteria 3 and 4. Submissions must meet all of the non-negotiable criteria in order for the review to continue to Section II.

For Section II, begin by reviewing the required indicators in Column 2 for each criterion. If there is a "Yes" for all required indicators in Column 2, then the materials receive a "Yes" in Column 1. If there is a "No" for any required indicators in Column 2, then the materials receive a "No" in Column 1.

Tier 1 ratings receive a "Yes" in Column 1 for Criteria 1 – 8.
Tier 2 ratings receive a "Yes" in Column 1 for all non-negotiable criteria, but at least one "No" in Column 1 for the remaining criteria.
Tier 3 ratings receive a "No" in Column 1 for at least one of the non-negotiable criteria.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
SECTION I: NON-NEGOTIABLE CRITERIA: Submissions must meet Criteria 1 and 2 for the review to continue to Criteria 3 and 4. Submissions must meet all of the non-negotiable criteria in order for the review to continue to Section II.			
Non-Negotiable **1. THREE-DIMENSIONAL LEARNING:** Students have multiple opportunities throughout each unit to develop an understanding and demonstrate application of the three dimensions. ☒ Yes ☐ No	**REQUIRED** **1a)** Materials are designed so that students develop scientific content knowledge and scientific skills through interacting with the three dimensions of the science standards. The majority of the materials teach the science and engineering practices, crosscutting concepts and disciplinary core ideas separately when necessary but they are most often integrated to support deeper learning.	**Yes**	The instructional materials are designed so that students can develop scientific content knowledge and skills by interacting with the three dimensions. Students have multiple opportunities throughout each module to consistently demonstrate application of the three dimensions, and the three dimensions are most often integrated with one another to support a deeper learning of the performance expectations. Throughout the modules, students interact with several different science and engineering practices, disciplinary core ideas, and crosscutting concepts. Module 1, The Changing Earth, addresses Standard 4-ESS2-1. The crosscutting concept, cause and effect, is addressed several times throughout the module. For example, students view a photograph of Deer Creek Falls (page 51) and are asked what may have caused the holes in the rocks. In the module, they also investigate various forces of erosion to determine the cause and effect relationships between rocks and erosion (page 70). Cause and effect relationships are routinely identified, tested, and used to explain change as called for by standard 4-ESS2-1.

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			Module 2, Energy, addresses Standard 4-PS3-1. The disciplinary core idea UE.PS3A.a is appropriately addressed in Lessons 6 and 7 (page 49). In the lessons, students explore the relationship between speed and energy when they use various amounts of energy to pull back a car, windmill, and soccer ball. The science and engineering practice, constructing explanations and designing solutions, is also appropriately addressed throughout the lessons (pages 49-58). In Lesson 7, students learn how to quantify speed before they conduct an investigation. Students also participate in stations, make observations about the impact that energy has on various objects, and answer questions to construct an explanation such as, “Where do you think the energy came from at the stations?” Module 3, Sensing the Environment, addresses standard 4-LS1-1. In the module, the disciplinary core idea UE.LS1A.a is appropriately addressed. In Lesson 4, before students experience sense stations, the teacher explains that a structure is part of an animal’s body and it serves a function (page 42). Once students experience the stations and have an understanding of this idea, they write a response in their science logbooks. For example, they explain how skunks might sense insects underground and use

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			structure and function, crosscutting concept, to explain the skunk's body parts. Module 4, Light: Sight and Communication, addresses Standard 4-PS4-2. The science and engineering practice, developing and using models, is appropriately addressed. In Lesson 9, How Color Affects What We See Investigation, students develop a model to describe the interactions between color of light and how the color of an object affect what we see (pages 23-24). Students connect this information to what Amelia Earhart saw during her final flight as an aviator pilot.
Non-Negotiable **2. PHENOMENON-BASED INSTRUCTION:** Explaining phenomenon and designing solutions drive student learning. ☒ Yes ☐ No	**REQUIRED** **2a)** Observing and explaining phenomena and designing solutions provide the purpose and opportunity for students to engage in learning a majority of the time.	**Yes**	The majority of instructional time is centered around students observing and explaining phenomena and/or designing solutions. In each module, students are asked to observe and explain phenomena and design solutions, which provides the purpose and opportunity for learning. Each module includes anchor and investigative phenomena; the investigative phenomena help students explain how and why the anchor phenomena occurs in the real world. For example, the anchor phenomenon for Module 1, The Changing Earth, is "How did the Grand Canyon's features form?" In Lessons 1 and 2, the focus question is, "What can we discover in an unknown canyon?" In Lessons 3 and 4, the focus question is, "What do the Grand Canyon

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			rock layers reveal?" Both questions lead students to understand how the Grand Canyon's features were formed. The modules' investigative phenomena are related to the anchor phenomena and aide students in explaining how and why the anchor occurs in the real world. For example, in Module 2, Energy, students explore an anchor phenomenon, "How Do Windmills Change Wind into Light?" The lessons throughout the module are centered around several investigative phenomena and structured to help students explain how windmills work. Students make observations and generate questions about how windmills harness the wind, how windmills generate electricity, how energy is transferred in hand-crank flashlights, and how energy is transformed in various devices. After students complete the investigations, they use the information that they learned to explain how a windmill changes wind into light. Students are also asked to design solutions, compare various solutions, and make improvements to their design solutions using feedback from their peers. For example, in Module 4, Light: Sight and Communication, students investigate the phenomenon of Amelia Earhart's famous flight and the reasons that she did not complete her journey. After learning about

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			how we see and how light affects vision, students design a runway that could be seen in various conditions. Students use the engineering process to refine and revise their models and present them to their peers for feedback. Students are asked to think about which solutions worked better (page 140) and look for patterns in successful designs.
Non-Negotiable (only reviewed if criteria 1 and 2 are met) **3. ALIGNMENT & ACCURACY:** Materials adequately address the Louisiana Student Standards for Science. ☒ Yes ☐ No	**REQUIRED** **3a)** The majority of the Louisiana Student Standards for Science are incorporated, to the full **depth of the standards**.	**Yes**	93% (13 out of 14) of the Louisiana Student Standards for Grade 4 are appropriately addressed by the instructional materials. Standard 4-ESS2-3 is not addressed in the curriculum. Module 1, The Changing Earth, addresses Standards 4-ESS1-1, 4-ESS2-1, 4-ESS2-2, 4-ESS3-1, 4-ESS3-2. In the module, students explore the anchor phenomenon, "How did the Grand Canyon's Features form?" For example, standard 4-ESS2-2 is fully addressed when students analyze and interpret data (SEP) from a volcanic map (page 114), examine plate tectonics and large-scale system interactions (DCI) by interpreting a relief map, and identify patterns (CCC) in the location of mountains and occurrences of earthquakes. Students also engage in a writing task when they predict where a canyon might be located using a relief map (page 122). Module 3, Sensing the Environment, addresses Standards 4-LS1-1 and 4-LS1-2. During the module, students visit "Sense

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			Stations" and conclude that humans and animals can sometimes sense and respond to information in their environment in different ways. Students are asked to use the evidence gathered at the stations to construct an explanation (page 42). As students visit the stations, they also recognize that animals have structures that have a specific function (DCI). Throughout Lesson 5 (pages 46-50), students understand how an animals' sensory system is different from that of humans, which addresses the crosscutting concept, systems and system models. For example, they explore what causes elephants to sense a rainstorm. Likewise, Modules 3 and 4 addresses standards 4-PS4-1 and 4-PS4-2. Students develop models (SEP) to explore and observe patterns (CCC) in waves as called for by the standards.
	REQUIRED **3b)** Science content is **accurate**, reflecting the most current and widely accepted explanations.	**Yes**	All reviewed content was accurate, up-to date and aligned with the most current and widely accepted explanations. No evidence could be found of incorrect or out of date science explanations.
	3c) In any one grade or course, instructional materials spend minimal time on content outside of the course, grade, or grade-band.	**Yes**	The instructional materials spend minimal time on content outside of the course or grade-band. 81% of the addressed standards focus on Louisiana Student Standards in 4th grade. The three standards that do not fall within the current Standards are 3-5ETS1-2, 3-

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			5ETS1-3, 4-PS4-3. These standards are addressed in Module 1, Changing Earth, and Module 4, Light: Sight and Communication. For example, in Module 1, Lessons 11-16 focus on Standard 3-5-ETS1-2. Students complete an engineering challenge to design a structure to reduce the damage of erosion. Module 4 Lesson 20 -23 includes engineering design challenges that target standards 3-5-ETS1-2 and 3-5ETS1-3 asking students to develop and build a solution to increase visibility. Although these activities do not explicitly address Louisiana Student Standards for Science, they enhance teaching and learning, are connected to other standards, and do not distract from the overall learning targets.
Non-Negotiable (only reviewed if criteria 1 and 2 are met) **4. DISCIPLINARY LITERACY:** Materials have students engage with authentic sources and incorporate speaking, reading, and writing to develop scientific literacy. ☒ Yes ☐ No	**REQUIRED *Indicator for grades 4-12 only** **4a)** Students regularly engage with **authentic sources** that represent the language and style that is used and produced by scientists; e.g., journal excerpts, authentic data, photographs, sections of lab reports, and media releases of current science research. Frequency of engagement with authentic sources should increase in higher grade levels and courses.	**Yes**	Students have multiple opportunities to regularly engage with authentic resources that represent the language and style that is used and produced by scientists. Authentic photographs, media content, graphs, and articles are regularly included in the materials. In Module 1, Changing Earth, students engage with authentic photographs that show the Grand Canyon in the past and present. For example, a photograph of Powell's 1871 Expedition Team to the Grand Canyon is included (page 19) to help

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			students gain an understanding of how the Grand Canyon's features were formed. Likewise, in Module 2, Energy, students examine photographs from FEMA after Hurricane Harvey in Houston (page 126). While learning about wind energy, students look at a diagram of a windmill (page 22) that is generating electricity in homes. In Model 2 (page 68), after completing an investigation and gathering data, students create a bar graph to assist with analyzing data and understanding the relationship between speed and energy. In Module 3, Sensing Their Environment, students view a video, GCSE Science Revision- Types of Waves, to get an idea of how waves caused by earthquakes and ocean waves. Authentic locations, scientists, and research are presented in the video. Also, in Module 3 (page 21) students read an excerpt from a "Popular Science" article to understand how elephants are able to detect rainstorms.
	REQUIRED **4b)** Students regularly engage in **speaking and writing** about scientific phenomena and engineering solutions using authentic science sources; e.g., authentic data, models, lab investigations, or journal excerpts. Materials address the necessity of using **scientific evidence** to support scientific ideas.	**Yes**	Students regularly engage in speaking and writing about scientific phenomena and engineering solutions. Students discuss scientific phenomena using authentic sources and use scientific evidence from the sources and investigations to support scientific claims and ideas. Throughout the modules students have multiple opportunities to speak and write

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			the phenomena. In Module 1, The Changing Earth, students speak and write about how Earth's processes have changed the Grand Canyon's features over time, the anchor phenomenon. In Lesson 1, students review authentic photographs of the Grand Canyon, complete a "Notice and Wonder" chart in a science log book, and record observations based on what they notice about the rock layers. In Lesson 4, students make a claim about which layer of rock was formed first and which layer was formed last. In Lesson 5, students make claims about how the holes formed in the rocks. Students discuss their claims while considering the question, "How did the Grand Canyon's Features Form?" In Module 2, Using Science Logbook, students are asked reflection questions after completing investigations. For example, students are asked to identify patterns in data, explain the differences using evidence from the experiment, and draw conclusions about the relationship between speed and energy (page 14). In Module 3, Sensing the Environment, students complete a research project to determine how plants respond to their environment. During the project, students are asked to make claims and use scientific evidence to support their claims.

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			In Module 4, Light: Sight and Communication, students participate in a class discussion about Amelia Earhart's flight, and they are asked to cite evidence from their experiments to explain their thinking (page 14). Opportunities for students to engage in speaking and writing about phenomenon are made meaningful through the consistent use of an anchor phenomenon setting a purpose for learning in each module.
	REQUIRED **4c)** There is **variability** in the tasks that students are required to execute. For example, students are asked to produce solutions to problems, models of phenomena, explanations of theory development, and conclusions from investigations.	**Yes**	There is variability in the tasks that students are required to execute throughout the instructional materials. Students are asked to engage in a variety of tasks including making observations, making claims, creating models, and designing solutions to problems. In Lesson 2, Module 1, The Changing Earth, the teacher leads the class in developing an anchor model (page 25) of how the Grand Canyon was formed. Likewise, in Module 4, Light: Sight and Communication, students draw models to explain different aspects of sight (page 7, Model 4 Activity guide). In Module 2, Energy, students complete an investigation plan to determine which objects use a little energy (page 48) and which objects use a lot of energy. After the

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			investigation, students conduct a race to investigate speed (page 58). In Module 3, Sensing the Environment, Lessons 4 and 5, students make observations as they visit sense stations (page 42).
	4d) Materials provide a coherent sequence of authentic science sources that build scientific **vocabulary** and knowledge over the course of study. Vocabulary is addressed as needed in the materials but not taught in isolation of deeper scientific learning.	**Yes**	The materials provide students ample opportunity to build scientific vocabulary over the course of study. Vocabulary is used throughout the materials as the students complete their investigations and participate in class discussions for deeper learning. For example, in Module 1, The Changing Earth, students have multiple experiences with describing rock layers. The teacher explains that geologists refer to the big stripes on rocks as layers. Students continue to explore the concept of layers through investigations and begin to construct an understanding of the concepts as they progress through the module. In Module 2, Energy, students are asked to construct a model of how to harness the wind from a windmill (pages 27 and 28). The teacher asks the question, “What could be moving through the wires?” The text prompts the teacher to introduce the students to the term energy and then explains how energy is useful.

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			In Module 3, Sensing the Environment, the term wave is not introduced to students until they experience the concept and draw a model of it. Students create ripples in water and draw what the ripples look like. Later in the module, the teacher throws a piece of paper and asks students to observe what happens. After this discussion, the terms response and behavior are discussed.
SECTION II: ADDITIONAL INDICATORS OF QUALITY			
Additional Criterion **5. LEARNING PROGRESSIONS:** The materials adequately address Appendix A: Learning Progressions. They are coherent and provide natural connections to other performance expectations including science and engineering practices, crosscutting concepts, and disciplinary core ideas; the content complements the Louisiana Student Standards for Math. ☒ Yes ☐ No	**REQUIRED** **5a)** The overall organization of the materials and the development of disciplinary core ideas, science and engineering practices, and crosscutting concepts are coherent within and across units. The **progression of learning** is coordinated over time, clear and organized to prevent student misunderstanding and supports student mastery of the performance expectations.	**Yes**	The overall organization of the materials support student mastery of the standards. The progression of learning is coordinated over time, clear and organized to prevent student misunderstanding. Throughout each module, the class creates a driving question board to relate concept questions and guide upcoming lessons. The driving question board helps to focus the progression of learning for the anchor phenomenon. The science and engineering practices, crosscutting concepts, and disciplinary core ideas are coherently sequenced across all of the lessons and continuously reinforced throughout the modules. For example, in Module 1, students explore rock layers in Lessons 1-4, which focuses on Standard 4-ESS1-1. Throughout the lessons, students identify patterns (CCC) in rock formations and develop an explanation (SEP) about how they formed.

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			In Lessons 5-13, students investigate the concepts of weathering and erosion, which focuses on Standard 4-ESS2-1. Students investigate (SEP) the effects (CCC) of water, ice, and wind on weathering and erosion. In Module 3, Lesson 1-3, students explore elephants and how they sense rainstorms. Next, in Lessons 4-6, they develop an understanding of animal and elephant senses, which addresses Standards 4-LS1-1 and 4-LS1-2. The science and engineering practice of developing and using models is presented several times throughout Module 3. Eventually, students independently create models. For example, students investigate a wave tank and the motion of a boat in the tank and later create a wave model in groups using a slinky.
	5b) Students apply mathematical thinking when applicable. They are not introduced to math skills that are beyond the applicable grade's expectations in the Louisiana Student Standards for Mathematics. Preferably, **math connections** are made explicit through clear references to the math standards, specifically in teacher materials.	**Yes**	Students apply mathematical thinking when applicable, and in some cases, mathematical standard correlations are explicitly stated. For example, the Module 2, Lesson 4, Interdisciplinary Connection: Mathematics, addresses math Standards 4.OA.A.1 and 4.MD.A.1. Students use estimation to determine the distance a car is pulled back during the investigations that are centered around speed and they use comparative phrases and measure.

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			Module 3, Lesson 1, addresses math Standard 4.MD.2, solve word problems involving distance. Students are asked to think about what the environment is like in a town 150 miles away. Module 4, Sight: Light and Communication, addresses math Standard 4.GA.1. Students determine that light travels in rays and connect it to the mathematical geometry term "ray."
Additional Criterion **6. SCAFFOLDING AND SUPPORT:** Materials provide teachers with guidance to build their own knowledge and to give all students extensive opportunities and support to explore key concepts using multiple, varied experiences to build scientific thinking. ☒ Yes ☐ No	**REQUIRED** **6a)** There are separate **teacher support** materials including: scientific background knowledge, support in three-dimensional learning, learning progressions, common student misconceptions and suggestions to address them, guidance targeting speaking and writing in the science classroom (i.e. conversation guides, sample scripts, rubrics, exemplar student responses).	**Yes**	There are separate teacher support materials, including support in three-dimensional learning, scientific background knowledge, suggestions for diverse learners, and understanding learning progressions. The modules have sections, Spotlight on the Three Dimensions, to help teachers develop a deeper understanding of the science and engineering practices, crosscutting concepts, and disciplinary core ideas that are addressed in the module. For example, Module 2, Spotlight on the Three Dimension states, "Each lesson in the module identifies the components of three-dimensional teaching and integration. However, simply representing the three dimensions in the lessons does not constitute three-dimensional teaching and integration...At the end of the module, students draw on everything they have learned about energy

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			and use the three dimensions to create a device that harnesses energy." The "Teacher Note" sections throughout the modules also offer guidance to teachers on how students should respond to certain questions or activities in the lesson and how to address common student misconceptions. In the Spotlight on Disciplinary Core Ideas, Module 2, teachers are provided with information on how to reduce misconceptions regarding the types of energy (page 39). Likewise, the Module 2, Formative Assessment Opportunity, prompts the teacher to meet with students individually or in a small group to address misconceptions about energy before the End-of-Module Assessment (page 153). The materials include speaking and listening supports and resources to deepen scientific knowledge for both the teacher and students. The Implementation Guide includes question stems to support student discussion, and background content knowledge to support teachers' understanding of the concepts. For example, in the guide there are Collaborative Conversation Prompts (page 27) and an Energy overview to assist teachers with content background information (page 29). Likewise, in Module 2, there is an additional reading for teachers, "Energy: Stop Faking It" and

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			"Teaching Energy Across the Sciences (page 11)."
	6b) Appropriate suggestions and materials are provided for **differentiated instruction** supporting varying student needs at the unit and lesson level (e.g., alternative teaching approaches, pacing, instructional delivery options, suggestions for addressing common student difficulties to meet standards, etc.).	**Yes**	There are appropriate suggestions and materials for differentiated instruction which support varying student needs. The teacher's manual provides suggestions for instructing diverse learners, suggestions for addressing common student difficulties to meet the standards, and learning progress/pacing guides. For example, in Module 2, there are boxes that provide information on how to support diverse learners (page 40). One suggestion differentiates the lesson by allowing students to arrange their ideas on sentence or stick notes. The materials also provide guidance for addressing student misconceptions. For example, Module 3, Formative Assessment Opportunity, prompts the teacher to meet with students individually or in a small group to address misconceptions about sensing and responding to information before the End-of-Module Assessment (page 207). Learning progressions supports are also included in the materials. For example, in Module 1, Building Knowledge Across Grades, teachers are provided with

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			information on what students learned in grade 3 and how to connect that information to Earth's History, which is addressed in grade 4 (page 11).
Additional Criterion **7. USABILITY:** Materials are easily accessible, promote safety in the science classroom, and are viable for implementation given the length of a school year. ☒ Yes ☐ No	**REQUIRED** **7a)** Text sets (when applicable), laboratory, and other scientific materials are **readily accessible** through vendor packaging.	**Yes**	Text sets, laboratory materials, and other scientific materials are readily accessible through vendor packaging. The teacher's manual is online and may be downloaded as a PDF file or used online. The modules contain the information needed to teach the lesson including links to relevant videos and reading materials. The material laboratory kits can be purchased from an external source. For example, in Module 1, The Changing Earth, students complete an investigation that is centered around stations. The student's Science Logbook includes detailed instructions and a guide on how to complete the stations (pages 13-15). The teacher materials also include detailed set up instructions (pages 224-226) and procedure sheets that students can use as they complete the activity. According to the implementation guide, the material kits include all of the necessary materials to complete the lessons and can be purchased from an external source. However, additional reading materials are included at times but require extra effort on the part of the teacher at times. For example, in Module 1, Lesson 19, the teacher reads a passage to the students

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			titled "How the Grand Canyon Was Formed," which is included in the materials. In some cases, the additional reading materials would need to be accessed separately. Such as in Module 2, Lesson 2, where students read Wind Turbine Service Technician by Wil Mara (2013) at http://gmscience.link/1039. The link requires a registration to Epic and purchase of the book after 30 days.
	7b) Materials help students build an understanding of standard operating procedures in a science laboratory and include **safety** guidelines, procedures, and equipment. Science classroom and laboratory safety guidelines are embedded in the curriculum.	**Yes**	The materials help students build an understanding of standard operating procedures in a science laboratory and include safety guidelines, procedures, and equipment. Science classroom and laboratory safety guidelines are embedded in the curriculum. For example, in Module 2, Lesson 10, the teacher is directed to discuss safety directions with students such as not looking directly into a light bulb or touching a hot lamp (page 85). There are also Safety Considerations for the teacher (page 13). The information includes guidance for safety procedures in a science classroom provided by NSTA. The Implementation Guide provides a detailed description of safety in the science classroom including addressing how students should behave and what they should wear (pages 10-12).
	7c) The total amount of content is **viable** for a school year.	**Yes**	The total amount of content is viable for the school year. The four modules are

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			divided into lessons which are expected to last 45 minutes. For example, Module 1 includes 25 lessons, Module 2 includes 26 lessons, Module 3 includes 31 lessons, and Module 4 includes 27 lessons. There is a total of 109 lessons, which allows teachers flexibility with time and accounts for the interrupted days that may occur during the school year. Module 1, Page 88, states "The design process should take approximately three days but may vary as materials, redesign, and time allotted can impact the timeline for completion."
Additional Criterion **8. ASSESSMENT:** Materials offer assessment opportunities that genuinely measure progress and elicit direct, observable evidence of the degree to which students can independently demonstrate the assessed standards. ☒ Yes ☐ No	**REQUIRED** **8a) Multiple types** of formative and summative assessments (performance-based tasks, questions, research, investigations, and projects) are embedded into content materials and assess the learning targets.	**Yes**	Multiple types of formative and summative assessments are in the instructional materials. In each module, conceptual checkpoints are embedded within the lessons and teachers have opportunities to address any misconceptions. At the end of each module, students complete an end of module assessment, which addresses all of the standards within the module. For example, in Module 3, Sensing the Environment, students learn about plant and animal structures. A formative assessment is included in the conceptual checkpoint (page 23). Students are asked to compare one plant and animal structure. Students are given "look for" tasks, and suggestions are given on how to

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			address student misconceptions if they to do not master the concept. In Module 2, Energy, the end of module assessment includes assessment items that address each standard in the module. For example, standard 4-PS3-4 is addressed in number 3 of the end of module assessment. Students are asked to explain a model of a laptop that is powered by a solar panel. Students must use knowledge gained from experiences in the module as evidence to support thinking. Also, at the end of each module, there is an "End-of-Module" assessment which includes Socratic Seminars, Assessments, and Debriefs. Multiple types of formative and summative assessments are embedded into the content materials and assess the learning targets. In Module 2, students participate in a discussion about the stations that they complete in an investigation (page 37). The teacher is provided with guidance on to assess the students understanding in the "Formative Assessment Opportunity" box.
	REQUIRED **8b)** Assessment items and tasks are structured on integration of the **three-dimensions**.	**Yes**	Assessment items and tasks are structured on the integration of the three-dimensions. For example, the Module 1 End-of-Module Assessment assesses students' scientific understanding of the anchor phenomenon.

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			Students are required to explain how Earth's processes shape some of the Earth's features. Module 1 addresses standard 4-ESS2-1. In Lesson 5 the teacher materials include a formative assessment opportunity (page 49). Students explain how interactions between materials cause changes. Students are being assessed on their ability to describe changes as well as the cause and effect. This formative assessment task integrates the three-dimensions through the (SEP) constructing an explanation and the (CCC) by explaining what caused the changes and understanding how weathering causes changes (DCI). Module 3 addresses standard 4-LS1-2. Students analyze field notes from a team that is observing the responses of a serval in the wild (DCI). The students are instructed to construct an explanation of what sense the serval used to find its prey (SEP). Students are also asked to use cause and effect relationships (CCC) to determine why the serval responds in certain ways to the information received through its senses. In Module 4, while addressing standard 4-PS4-2, students develop models of Howland Island and revise the models as they obtain new information and understanding. Students develop the

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			models (SEP) and investigate light through a shadow box and light reflection on various surfaces (page 72). As new information is discovered, the class adds to the anchor chart (page 57) detailing how light allows objects to be seen (DCI). Students use cause and effect relationships (page 31) as light reflects off of surfaces (CCC).
	8c) Scoring guidelines and rubrics **align** to performance expectations, and incorporate criteria that are specific, observable, and measurable.	**Yes**	Scoring guidelines and rubrics reflect performance expectations and give detailed specific criteria used in the grading of each item. For example, the end of module assessment in Module 1, The Changing Earth, addresses standard 4-ESS2-2. Question three asks students to analyze and interpret a map to describe areas that canyons may be located. According to the rubric that is included with the assessment, students must correctly select two possible canyon sites and explain how overlapping patterns (CCC) in mountain ranges (DCI) and volcanoes may indicate the presence of canyons. If the student correctly selects one possible canyon site and explains how overlapping patterns in mountains and volcanoes may indicate the presence of canyons or the student correctly selects two possible canyon sites, the student partially meet the performance expectations (page 182).

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			Module 3, Sensing the Environment, addresses Standard 4-LS1-2. Question 1 requires students to explain how they can hear a door slam using their knowledge of energy, waves, and receptors (page 214). Students must have an understanding of structure and function (DCI) to answer the question and explain the cause and effect of how something happens (CCC). A rubric is included and states, "If the student can successfully make the connection between energy, waves, and receptors the student's answer has met expectations (page 219)."

FINAL EVALUATION

Tier 1 ratings receive a "Yes" in Column 1 for Criteria 1 – 8.

Tier 2 ratings receive a "Yes" in Column 1 for all non-negotiable criteria, but at least one "No" in Column 1 for the remaining criteria.

Tier 3 ratings receive a "No" in Column 1 for at least one of the non-negotiable criteria.

Compile the results for Sections I and II to make a final decision for the material under review.

Section	Criteria	Yes/No	Final Justification/Comments
I: Non-Negotiables	1. Three-dimensional Learning	**Yes**	Students have multiple opportunities throughout each module to consistently demonstrate application of the three dimensions, and the three dimensions are most often integrated with one another to support a deeper learning of the performance expectations.
	2. Phenomenon-Based Instruction	**Yes**	The majority of instructional time is centered around students observing and explaining phenomena and/or designing solutions. Students are asked to observe and explain phenomena and design solutions, which provides the purpose and opportunity for learning.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
	3. Alignment & Accuracy	**Yes**	93% (13 out of 14) of the Louisiana Student Standards for Grade 4 are appropriately addressed by the instructional materials and minimal time is spent on content that is outside of the course.
	4. Disciplinary Literacy	**Yes**	Authentic photographs, media content, graphs, and articles are regularly included in the materials. Students discuss scientific phenomena using authentic sources and use scientific evidence from the sources and investigations to support scientific claims and ideas. Vocabulary is used throughout the materials as students complete their investigations and participate in class discussions for deeper learning.
II: Additional Indicators of Quality	5. Learning Progressions	**Yes**	The overall organization of the materials support student mastery of the standards and the progression of learning is coordinated over time, clear and organized to prevent student misunderstanding. Students also apply mathematical thinking when applicable, and in some cases, mathematical standard correlations are explicitly stated in the materials.
	6. Scaffolding and Support	**Yes**	There are separate teacher support materials, including support in three-dimensional learning, scientific background knowledge, suggestions for diverse learners, and understanding learning progressions.
	7. Usability	**Yes**	Text sets, laboratory materials, and other scientific materials are readily accessible through vendor packaging. The materials

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			help students build an understanding of standard operating procedures in a science laboratory and include safety guidelines, procedures, and equipment. Science classroom and laboratory safety guidelines are embedded in the curriculum, and the total amount of content is viable for the school year.
	8. Assessment	**Yes**	Assessment items and tasks are structured on the integration of the three-dimensions. Scoring guidelines and rubrics reflect performance expectations and give detailed specific criteria used in the grading of each item.
FINAL DECISION FOR THIS MATERIAL: **Tier I, Exemplifies quality**			

Appendix I.

Publisher Response

The publisher had no response.

Appendix II.

Public Comments

There were no public comments submitted.