DEPARTMENT of EDUCATION
Louisiana Believes

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: **Activate Learning Certified Version OpenSciEd** Grade/Course: **6-8**

Publisher: **Activate Learning** Copyright: **2022**

Overall Rating: **Tier 1, Exemplifies quality**

Tier 1, Tier 2, Tier 3 **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	
8. Assessment	

Each set of submitted materials was evaluated for alignment with the standards beginning with a review of the indicators for the non-negotiable criteria. If those criteria were met, a review of the other criteria ensued.

Tier 1 ratings receive a "Yes" for all Non-negotiable Criteria and a "Yes" for each of the Additional Criteria of Superior Quality.
Tier 2 ratings receive a "Yes" for all Non-negotiable Criteria, but at least one "No" for the Additional Criteria of Superior Quality.
Tier 3 ratings receive a "No" for at least one of the Non-negotiable Criteria.

Click below for complete grade-level reviews:

Grade 6 (Tier 1) Grade 7 (Tier 1) Grade 8 (Tier 1)

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Title: **Activate Learning Certified Version OpenSciEd** Grade/Course: **6**

Publisher: **Activate Learning** Copyright: **2022**

Overall Rating: **Tier 1, Exemplifies quality**

Tier 1, Tier 2, Tier 3 **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	
8. Assessment	

To evaluate instructional materials for alignment with the standards and determine tiered rating, begin with **Section I: Non-negotiable Criteria**.

- Review the **required**[1] Indicators of Superior Quality for each **Non-negotiable** criterion.
- If there is a "Yes" for all **required** Indicators of Superior Quality, materials receive a "Yes" for that **Non-negotiable** criterion.
- If there is a "No" for any of the **required** Indicators of Superior Quality, materials receive a "No" for that **Non-negotiable** criterion.
- Materials must meet **Non-negotiable** Criteria 1 and 2 for the review to continue to **Non-negotiable** Criteria 3 and 4. Materials must meet all of the **Non-negotiable** Criteria 1-4 in order for the review to continue to Section II.
- If materials receive a "No" for any **Non-negotiable** criterion, a rating of Tier 3 is assigned, and the review does not continue.

If all Non-negotiable Criteria are met, then continue to **Section II: Additional Criteria of Superior Quality.**

- Review the **required** Indicators of Superior Quality for each criterion.
- If there is a "Yes" for all **required** Indicators of Superior Quality, then the materials receive a "Yes" for the additional criteria.
- If there is a "No" for any **required** Indicator of Superior Quality, then the materials receive a "No" for the additional criteria.

Tier 1 ratings receive a "Yes" for all Non-negotiable Criteria and a "Yes" for each of the Additional Criteria of Superior Quality.
Tier 2 ratings receive a "Yes" for all Non-negotiable Criteria, but at least one "No" for the Additional Criteria of Superior Quality.
Tier 3 ratings receive a "No" for at least one of the Non-negotiable Criteria.

[1] **Required Indicators of Superior Quality** are labeled "**Required**" and shaded yellow. Remaining indicators that are shaded white are included to provide additional information to aid in material selection and do not affect tiered rating.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
SECTION I: NON-NEGOTIABLE CRITERIA OF SUPERIOR QUALITY **Materials must meet Non-negotiable Criteria 1 and 2 for the review to continue to Non-negotiable Criteria 3 and 4. Materials must meet all of the Non-negotiable Criteria 1-4 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 (SEP), crosscutting concepts (CCC), and disciplinary core ideas (DCI) in an integrated manner to support deeper learning.	**Yes**	The instructional 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 materials integrate the Science and Engineering Practices (SEP), Crosscutting Concepts (CCC), and Disciplinary Core Ideas (DCI) to support deeper learning. In the Light and Matter unit, students develop knowledge to explain how light interacts to form a one-way mirror by engaging in various science practices and examining the phenomenon through the lens of several cross-cutting concepts. In Lesson 1, over a four-day period, students investigate a mirror system and build the practice of Developing and Using Models (SEP) by using systems thinking (CCC, Systems and Systems Models) as they grapple with initial explanations of phenomenon that involve the role of light in the reflective nature of materials (DCI, MS.PS4B.a). Students develop a list of important components and use it to develop an initial model. They further develop the practice of modeling by investigating the phenomenon through a scale model to observe how light interacts with materials within the system (CCC,

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			Systems and Systems Models) to make them reflective or transparent (DCI, MS.PS4B.a). In Lessons 2-4, students develop and refine experimental questions as well as plan and conduct investigations to further explore the relationship between light reflection/transmission and the structure of different materials (SEP, Asking Questions and Defining Problems, Planning and Carrying Out Investigations; CCC, Structure and Function; DCI, MS.PS4B.a). In Lesson 5, students utilize revised models and scientific ideas developed through investigation about the way light travels in order to construct an explanation for what causes the one-way mirror phenomenon (SEP, Constructing Explanations and Designing Solutions; CCC, Cause and Effect; DCI, MS.PS4B.a, MS.PS4B.b). In the Earth and Space unit, the first two lesson sets deeply engage students in the practice of modeling at various scales and investigating patterns in data to explain global seasonal temperature variation, solar eclipses, and phases of the moon (SEP, Developing and Using Models, Analyzing and Interpreting Data; CCC, Patterns, and Scale, Proportion, and Quantity; DCI, MS.ESS1A.a, MS.ESS1B.b). In Lesson 4, students examine data related to seasonal temperature and distance relative to the sun (SEP, Analyzing and Interpreting Data) and conduct an investigation with a

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			physical model that demonstrates the patterns (CCC, Patterns) between the angle of light and amount of energy in order to explain how changes in angle of sunlight affect temperature on Earth (DCI, MS-ESS1.A). In the Contact Forces unit, the second lesson set engages students in creating and using mathematical models through a series of investigations to determine the relationship between mass, speed, and kinetic energy (SEP, Planning and Carrying out Investigations, Analyzing and Interpreting Data; CCC, Scale, Proportion, and Quantity; DCI, MS.PS3A.a). In Lesson 7, students plan and conduct an investigation (SEP, Planning and Carrying Out Investigations) to determine how doubling the speed or mass affects the resulting damage in a collision, as well as analyze data (SEP, Analyzing and Interpreting Data) and make connections to scale factors (CCC, Scale, Proportion, and Quantity) which prompt the need for a mathematical model. Students then utilize a simulation to observe how a cart behaves at different masses and interpret results of investigations to make and explain predictions about how changes in the mass and speed will impact kinetic energy (SEP, Analyzing and Interpreting Data; CCC, Scale, Proportion, and Quantity; DCI, MS.PS3A.a).

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
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 a coherent sequence of learning a majority of the time. Phenomena provide students with authentic opportunities to ask questions and define problems, as well as purpose to incrementally build understanding through the lessons that follow.	**Yes**	Phenomena in the form of common experiences at the beginning of each unit prompt students to generate questions and define problems which induce learning about the core ideas of the unit, and establish the purpose for student engagement in the investigations and lessons that follow as students work to build understanding of the phenomena. The Cells and Systems unit starts with students exploring a scenario of a boy who fully recovered after dropping a weight on his foot in PE and being unable to walk for months. Over the course of the unit, students work toward figuring out how this student's foot healed and to answer the big question, "How do living things heal?" In Lesson 1, students engage with medical reports, co-construct a definition of "healing," and create a healing timeline and an initial model to explain what happened in his recovery before generating questions for the driving question board and ideas for how they might investigate their questions as a class. The class arrives at the idea that exploring how parts work together in an uninjured foot will help them explain why they do not work in one that is injured. Over the next few lessons, students investigate bones, muscles, skin and discover the need for deeper exploration of blood and nerves to eventually determine that all living things are made of cells. After putting this idea together,

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			the class recognizes the need to look more closely at what happens to cells during an injury, and students spend the next several lessons figuring out that human bodies need to make new cells to heal and that cells need certain conditions in order to reproduce. Each lesson has a guiding question that connects to student-generated questions and navigation designed to maintain coherence in exploring the healing phenomenon. Throughout the unit, there are several ways in which students track progress toward explaining the phenomenon, including revisiting and revising the model, individually adding notes to a Progress Tracker, and discussions designed to assess what the class can already explain and what they still need to investigate. In Lessons 12-13, students use what they have learned to explain how structures and systems work together to heal an injury and apply these ideas to explain growth in the body. In the Forces at a Distance unit, students revisit the speaker model from the Sounds and Waves unit and further investigate the cause of the speaker vibrations. Over the course of Lesson 1, students view a short video of a speaker in slow motion, brainstorm ways to investigate the force inside the speaker that causes it to vibrate, observe the teacher dissecting a speaker to isolate its components, work to generate a model of the parts working together to create

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			sound, and create a homemade speaker using their models. As the unit moves forward, students investigate components of the system, energy transfer and forces within the system, and other ideas based on the questions they generate in Lesson 1 in order to incrementally explain the speaker phenomenon.
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**	The materials incorporate the majority (14 out of 19) of the Grade 6 Louisiana Student Standards for Science (LSSS) to the full depth of the standards. The materials do not address the following standards: LSSM 6-MS-LS2-1, 6-MS-LS2-2, 6-MS-LS2-3, 6-MS-PS1-1, and 6-MS-ESS3-4. While the materials do not integrate Disciplinary Cores Ideas (DCIs) from these standards, identified Science and Engineering Practices (SEPs) and Crosscutting Concepts (CCCs) are often integrated and explored throughout multiple units. For LSSS 6-MS-LS2-1, DCIs MS.LS2A.a, MS.LS2A.b, and MS.LS2A.c are not addressed. Analyzing and Interpreting Data is a supported practice in all but one of the Grade 6 units and deeply integrated into the Contact Forces, Earth in Space, and Cells and Systems units. Cause and Effect is a lens utilized in all Grade 6 units and deeply explored in the Forces at a Distance unit. For LSSS 6-MS-LS2-2, DCI MS.LS2A.d is not addressed. Constructing Explanations and Designing Solutions is a supported practice in the Contract Forces, Forces at a Distance, Cells and Systems

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			units and is deeply integrated in the Light and Matter unit. For LSSS 6-MS-LS2-3, DCIs MS.LS2B.a, MS.LS2B.b, MS.LS2B.c, & MS.LS2B.d are not addressed. Developing and Using Models is a supported practice in all of the Grade 6 units and is deeply explored in the Light and Matter and Forces at a Distance unit. Energy and Matter concepts appear in the Contact Forces, Sound Waves, and Forces at a Distance units. For LSSS 6-MS-PS1-1, DCIs MS.PS1.A.a and MS.PS1A.e are not addressed. Developing and Using Models is a supported practice in all of the Grade 6 units and is deeply explored in the Light and Matter and Forces at a Distance units. Scale, Proportion, and Quantity is deeply explored in the Light and Matter, Earth in Space, Cells and Systems units and also supported in the Forces at a Distance unit. For LSSS 6-MS-ESS3-4, DCIs MS.ESS3C.b, MS.ESS2.E.a, and MS.EVS1B.a are not addressed. Engaging in Argument from Evidence is supported in the Contact Forces, Sound Waves, and Cells and Systems units.
	Required **3b)** Science content is **accurate**, reflecting the most current and widely accepted explanations.	**Yes**	All content is accurate, up to date, and aligned with the most current and widely accepted explanations. The materials did not include evidence of incorrect or out of date science explanations. In the Earth in Space unit, students observe a modern day phenomenon in New York City, called Manhattanhenge, which is the alignment of the sun between particular buildings

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			twice a year. Students investigate this and other observable patterns in the sky from multiple perspectives at various scales in order to arrive at widely accepted scientific explanations for the movements within the Earth, Moon, and Sun system. In the Contact Forces unit, Lessons 11-16, students design a protective device after critically reading a scientific text about how concussions result in memory loss and how helmets protect the brain. The Extension activity directs students to the CDC website for extensive, up-to-date information about head injuries.
	3c) In any one grade or course, instructional materials spend **minimal time on content outside** of the course, grade, or grade-band.	**Yes**	Instructional materials spend minimal time on content outside of the course, grade, or grade-band. Time spent on concepts outside of the grade serves to maintain coherence in relation to the phenomenon. For example, students engage with content from the Grade 7 standard 7-MS-LS1-3 in the Cells and Systems unit in order to explore the relationship between body systems and healing in the body.
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.	**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 regularly engage with authentic sources that represent the language and style used and produced by scientists. The instructional materials incorporate a variety of authentic sources, including primary source documents, photographs, and authentic data sets. In the Light and Matter unit, Lesson 8, students develop experimental questions and identify the independent and dependent variables

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
☒ Yes ☐ No			while planning an investigation. In the Cells unit, Lesson 10, after analyzing data from an investigation and determining the need for more information, students review strategies for obtaining information from scientific texts and read one of four sourced, age-appropriate texts about single-celled organisms. In the Earth in Space unit, Lesson 3, students make predictions before viewing a video made with planetarium software to observe the simulated motion of the Sun through the sky throughout a single day at various times of the year. Students create a model to identify patterns as the Sun moves across the sky in the spring, summer, fall, and winter. They look for patterns in the angle of the Earth's axis in relation to the time of year and the length of sunlight upon the Earth. Students revise their models to reflect the information they gain from the video and the models they create.
	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 using authentic sources. Materials address the necessity of using scientific evidence to support ideas. Students regularly engage in productive science talk to generate driving questions, build understanding, and come to consensus. They also present and revise designs, gather evidence from multiple sources, and explain findings. In the Earth in Space unit, Lesson 14, students

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			exchange ideas about patterns of motion in the solar system. They discuss predictive cause and effect relationships for the Earth-Moon system based on those patterns. Using a simulation, students investigate how changes in distance and size affect an object's orbit around another object in the solar system and collect data in small groups in order to answer investigation questions. Students discuss the relationship between size, distance, and strength of the force of gravity upon the movement of objects in the solar system. In the Contact Forces unit, at the end of Lesson 1, students engage in a Scientist's Circle to share models generated from their investigation of how speakers work. The purpose of the discussion is to determine areas of agreement and disagreement in their initial models and to help decide their next steps in figuring out how the speaker works. In the Contact Forces unit, students develop and revise criteria and constraints and a protective device based on materials testing. In Lesson 16, students have the option to take this design project a step further to develop and deliver an investor pitch for their collision designs.

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	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. Within each module, students produce and revise models of the anchoring phenomenon. Across the materials, students regularly engage in a variety of tasks, such as constructing written explanations, planning and conducting investigations, making observations and collecting data with simulations, reading scientific texts, and designing using criteria and constraints. In the Cells unit, students revise a timeline for healing in which they explain why each event occurs in addition to revisiting and revising models. In the Contact Forces unit, Lessons 11-16, students design objects for protection during a collision, revising their designs throughout the engineering process. This design challenge supports students in fulfilling the standards requirements and engages them in critical thinking. In the Earth and Space unit, Lesson 13, students gather information from a text to identify connections and research observations about Venus. They identify and document additional patterns in other observations of Venus, adding new questions to their investigation. Using a model, students illustrate the relative position of motion for Venus and Earth within the system to explain the additional patterns. Students then further analyze and compare the scale properties of other planets to Venus to identify more patterns.

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	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 a coherent sequence of authentic science sources that build scientific vocabulary and knowledge over the course of study. Vocabulary is addressed as needed, but only after students first have the opportunity to build conceptual understanding of the term. The materials refer to new terms as "words we earn" and are added to the word wall without definitions. Students co-create the definitions as they discover new vocabulary in the lessons. The materials suggest that each class period creates their own accurate definitions and posts on a separate wall, if possible, or at least within individual notebooks. The materials do not provide vocabulary lists at the beginning of a lesson. Terms appear throughout the materials and are reinforced in each unit or lesson. In the Cells and Systems unit, a section of the teacher guide is devoted specifically to supporting the development of the word wall for the unit and includes lists of both learned and encountered words. In Unit 8.2 Sound Waves, Lesson 4, students record observations of sound graphs, and after analyzing the term amplitude, they add a shared definition to the word wall.
Section II: Additional Criteria of Superior Quality			

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
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 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 lessons within and across each unit are organized to support learning through a natural progression. Students engage with and build understanding of the three dimensions of the standards at increasing levels of complexity and sophistication and engage in a coherent progression of learning that is clear, organized, and coordinated over time. Teacher guidance includes a unit overview and storyline that outlines how questions and investigations drive student learning as students make discoveries throughout the unit. The overview also describes what the students will figure out, how they will represent what they learned, and how they will engage with all three dimensions in each lesson. There is also a section of background knowledge that provides additional guidance for adjusting the sequence. These resources support student mastery of the Performance Expectations and maintain coherence. In the Light and Matter unit, students create initial models to demonstrate knowledge and identify competing ideas about the path that light travels within a system and how the parts of the system interact to enable people to see something. As the unit progresses, students continue to investigate, ask questions, and modify their models according to the evidence they collect on how an object's material and shape influences the amount of light it transmits/reflects and the path the light

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			takes. Students continue to revise their models in this manner in order to identify how a path of light enters the human eye and interacts with the parts of the eye system and to illustrate the path of light along the optic nerve to the brain as it transforms into a visible image. This investigation of the unit phenomenon provides the evidence for students to construct an explanation of how one-way and two-way mirrors work. Students view short videos, read articles, develop questions for investigation, revise models according to data collected from investigations, and construct a scientific explanation for the unit phenomenon. Students engage in similar activities in the Forces at a Distance unit, as well. The unit-anchoring phenomenon is the vibration of a speaker and investigations aim to determine what causes the vibration. This builds upon concepts and skills developed in the Sound Waves unit and builds student understanding of how sound waves are reflected, absorbed, or transmitted through different materials and how light travels and is reflected or absorbed by different materials. The Forces at a Distance Unit begins with a video of a truck playing loud music, causing the windows of a building across the parking lot to visibly shake. Students develop initial models, investigate speakers and musical instruments, use motion sensors to collect data on

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			vibrations, and produce graphs to illustrate and identify patterns in order to construct an explanation for how the frequency and amplitude of sound waves affect sounds.
	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. Across the majority of the materials, students are not introduced to math skills that go beyond the Grade 6 Louisiana Student Standards for Mathematics (LSSM). Students are regularly called to apply mathematics skills and understanding to engage in Using Mathematics and Computational Thinking (SEP) appropriately within the context of their learning, though a few units reference math standards outside of the grade level. In the Sound Waves unit, Lessons 4-6 and 13, students compare functions expressed graphically (LSSM 8.F.A.2) and describe the relationship between two quantities (LSSM 8.F.B.5). These concepts would naturally come up when investigating amplitude and frequency for LSSS 6-MS-PS4-1, and the teacher materials provide guidance for supporting students. The Earth and Space unit, though not math intensive, references LSSM 7.RP.A.1, which involves unit rates. This unit builds upon the knowledge students constructed in the Forces at a Distance unit and focuses on several crosscutting concepts such as patterns, systems and systems models, and scale, proportion, and quantity. In the

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			Cells unit, Lesson 4, students use Grade 5 math (LSSM 5.NBT.A.2) with multiplication involving microscopes and scales.
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 (e.g. conversation guides, sample scripts, rubrics, exemplar student responses).	**Yes**	Separate teacher support materials are provided which include extensive teacher guidance with a Unit Overview and Storyline, a Teacher Background section (scientific background about the Disciplinary Core Ideas of the unit), 3-D Strategies sections that detail explicit techniques to further support the development of SEPs, DCIs, and CCCs, and an Assessment System Overview. Each lesson includes a detailed learning plan as well as a section that clarifies where the lesson is going and where it is not going, providing guidance for the appropriate level of depth into the content material. The materials also include editable powerpoint presentations to provide step-by-step guidance for each lesson, the Learning Plan Snapshot that outlines pacing and timing for each section of the lessons, a Lesson Overview that details how many days the lessons should take, and Learning Objectives that describe expectations for student learning. . In addition, support materials include a recap of previous lessons, a summary of what to anticipate in the following lesson, additional guidance for assisting students who need more intensive support and strategies for ensuring equity. The Teacher Portal provides all of the unit specific resources required to teach the units and

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			lessons in pdf format. This includes the Teacher Handbook, Teacher Edition, Student Edition in English and Spanish, Unit Planning resources, and Remote Learning resources. The teacher manuals also provide guidance for setting up notebooks and labs with pictures and materials.
	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**	Appropriate suggestions and materials are provided for differentiated instruction supporting varying student needs at the unit and lesson level. For example, each unit overview provides a pacing guide that points to additional mini-labs the teacher may incorporate at key points for students who need additional experiences and time to develop core ideas of the unit. Each unit overview also includes a Phenomenon Relevance Note that provides alternatives as well as suggestions for modifying the anchoring phenomenon to make it more accessible and locally and culturally relevant for students. Lesson materials include diverse learner supports and Equity Checks with specific tips, techniques, and points to consider, all which support the teacher in recognizing and valuing student resources and promoting equitable participation. Each unit and lesson includes full explanations of all standards and all parts of the standards, as well as teacher guides which provide support and guidance assistance in sidebar callout boxes titled "Attending to Equity" and subheadings such as

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			"Supporting Emerging Multilingual Learners" and "Supporting Universal Design for Learning." Other callout boxes with strategies include Additional Guidance, Alternate Activity, and Key Ideas. Each unit includes the development of a Word Wall as part of students' routines to "earning" or "encountering" scientific language. Individual units also include more specific structures for supporting diverse learners. For example, in the Cells unit, much of the Supporting Universal Design for Learning section focuses on engaging students authentically. The materials emphasize this goal by focusing on class norms and directing students to move forward in discussions. In the Contact Forces unit, Lesson 9 provides sentence frames from Lesson 2 in the call out box.
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, and other scientific materials are readily accessible through vendor packaging. The information needed for activities is readily available. The teacher portal section of the website allows teachers to view student and teacher books and access all student worksheets and slides for each lesson. Materials lists outline what is needed for investigations. Additionally, the teacher manuals provide the framework for setting up investigations, and every unit includes access to all student- and teacher-facing documents such as data sheets, readings, images, and slideshows.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			Kits are available through vendor packaging and include activity materials such as flashlights, batteries, duct tape, index cards, and light meters. The materials also list consumables for each lesson These "Locally Sourced" consumables include common items such as safety glasses, markers, copy paper, and pencils.
	Required **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**	Materials help students build an understanding of standard operating procedures in a science laboratory and include safety guidelines, procedures, and equipment. Unit- and lesson-level teacher guidance includes information on general lab safety with links to additional guidance, as well as a list of required school-provided safety equipment such as goggles, gloves, and aprons. In the Student Edition book for each unit, the directions for investigations include a caution symbol which advises students on precautions for conducting each activity. In Unit 6.1, Lesson 6, students are instructed to "Never look directly at sources of bright light, including a flashlight. Even relatively small amounts of laser light can lead to permanent eye injuries." In the Forces at a Distance unit, Lesson 4, a safety advisory states, "Do not leave the coil connected to the battery for an extended amount of time. The coil will heat up. Leave it disconnected and simply touch the lead to the battery to check the position of the compass needles. You may have to do this

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			several times." Specific safety precautions appear with yellow caution signs in the teacher call out box. In the Cells and Systems unit, Lesson 6, the safety precaution addresses the fragility of glass slides. Additionally, the lessons include preparation notes, which notify teachers of safety precautions. For example, in the Sound Waves unit, Lesson 3, the following preparation note is provided: "Avoid directing the laser (even reflected off the mirror) into anyone's eyes."
	7c) The total amount of content is **viable** for a school year.	**Yes**	The total amount of content is viable for a school year. The materials include a total of eighty-one lessons, most of which are multi-day lessons. Pacing guidance for the six units is provided and totals thirty-six weeks of instruction, or one hundred eighty days, for completion of all lessons and investigations. The majority of lessons include extension readings, videos, simulations, or alternative activities that teachers can also utilize for home or extended learning. For example, in the Earth in Space unit, Lesson 4, two readings, "The Equator, the Midnight Sun, and the Analemma" and "Meteorological vs Astronomical Seasons," can be used either in class or during home learning as deemed appropriate for the class and include handouts. The Light and Matter unit includes an extension activity that supports students in investigating scattering and specular reflection in order to explain everyday experiences.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			Instructional suggestions are included with each unit for lengthening or shortening lessons as needed to accommodate differences in required coverage of science standards or days available for instruction.
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 embedded into content materials and assess the learning targets. The lessons within each unit indicate opportunities for both formative and summative assessment and include assessment options, answer keys and rubrics. The Assessment System Overview in the Teacher Edition of each unit provides details for pre-assessments, student self-assessments, summative assessments, and formative assessments as they appear in each lesson. Lesson plans also embed formative assessments. The Cells unit includes embedded assessments in Lessons 7, 10, and 12-13. In Lesson 7, students make claims about cells based on evidence, and the Lesson 10 assessment expands on these claims to include ideas about bacteria. In Lesson 11, students describe how the systems interact, and the ideas culminate in Lesson 12 as students complete a task to explain how things grow. The Sound Waves unit includes assessments in Lessons 6, and 13-14. In Lesson 6, students analyze data and make scientific claims based on evidence before building on their findings to explain a sonic fire extinguisher in Lesson 13.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			Lesson 14 includes a unit assessment in which students explain why musicians experience hearing loss more often than others.
	Required **8b)** Assessment items and tasks are structured on integration of the **three dimensions** and include opportunities to engage students in applying understanding to new contexts.	**Yes**	Assessment items and tasks are structured on integration of the three dimensions and include opportunities to engage students in applying understanding to new contexts. Each lesson of the units includes at least one Lesson-Level Performance Expectation (LLPE), which are three-dimensionally structured to include the SEP, DCI, and CCC. The Unit assessments of each unit integrate SEPs in assessments as students use data, construct explanations, and develop models to address the anchor phenomena. The Teacher Guide for each lesson within the Lesson-by-Lesson Assessment Opportunities section lists the LLPEs for each lesson. The corresponding SEP, DCI, and CCC are color-coded to indicate alignment to each of the lesson assessments. In the Contact Forces unit, Part 1, Cheerleader Headgear Designs, students analyze data (SEP, Analyzing and Interpreting Data) to model (SEP, Developing and Using Models) and explain the structural properties of the designs (CCC, Patterns), demonstrating the full intent of LSSM 6-MS-PS2-1. Throughout lessons in each of the units, students revise models to reflect new understanding based on data collection in previous investigations and acquisition of

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			new knowledge from readings, videos, computer simulations, and student seminars. In the Forces at a Distance unit, students initially dissect a speaker to investigate how the parts of the system work and whether magnetic force is involved. As students progress through each lesson, further investigations help them to refine their model to include knowledge about magnetism and magnetic force. Student understanding is assessed through a series of formative and summative assessments.
	8c) Scoring guidelines and rubrics **align** to performance expectations, and incorporate criteria that are specific, observable, and measurable.	**Yes**	Scoring guidelines and rubrics align to performance expectations and incorporate criteria that are specific, observable, and measurable. The teacher reference section provides rubrics which include step- by-step student model answers that demonstrate proficiency for both formative and summative assessments. The Cells unit shows the development of the “Our Body as a System” poster with lesson-by-lesson explanations for what the students should add as a class. The same unit also provides extensive explanations of the class-developed timeline. In the Light and Matter unit, Lesson 3, the formative assessment rubric demonstrates alignment to the practices of developing questions and planning investigations as students identify what they want to test or change in an experiment (independent variable IV) and what they are going to

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			observe or measure (dependent variable DV) to revise their original experimental question. The rubric provides specific and measurable criteria for assessing student proficiency and a template for providing peer or teacher feedback in relation to the criteria. In the Sound unit, the modeling rubric provides detailed information regarding the components and interactions between components that should appear in student models. This provides information for teachers and students about progress toward proficiency in the practice of modeling, several cross-cutting concepts, and core ideas related to how sound travels.

FINAL EVALUATION
Tier 1 ratings receive a "Yes" for all Non-negotiable Criteria and a "Yes" for each of the Additional Criteria of Superior Quality.
Tier 2 ratings receive a "Yes" for all Non-negotiable Criteria, but at least one "No" for the Additional Criteria of Superior Quality.
Tier 3 ratings receive a "No" 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-negotiable Criteria of Superior Quality[2]	1. Three-dimensional Learning	**Yes**	The instructional 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 materials integrate the Science and Engineering Practices (SEP), Crosscutting Concepts (CCC), and Disciplinary Core Ideas (DCI) to support deeper learning.

[2] Must score a "Yes" for all Non-negotiable Criteria to receive a Tier I or Tier II rating.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
	2. Phenomenon-Based Instruction	**Yes**	Phenomena in the form of common experiences at the beginning of each unit spark students to generate questions and define problems to motivate learning about the core ideas of the unit and establish the purpose for student engagement in the investigations and lessons that follow as students work towards figuring out the phenomena.
	3. Alignment & Accuracy	**Yes**	The materials incorporate the majority (14 out of 19) of the Grade 6 Louisiana Student Standards for Science (LSSS) to the full depth of the standards. The materials do not address the following standards: LSSM 6-MS-LS2-1, 6-MS-LS2-2, 6-MS-LS2-3, 6-MS-PS1-1 and 6-MS-ESS3-4. All content is accurate, up-to-date, and aligned with the most current and widely accepted explanations. Instructional materials spend minimal time on content outside of the course, grade, or grade-band.
	4. Disciplinary Literacy	**Yes**	Students regularly engage with authentic sources that represent the language and style used and produced by scientists. The instructional materials incorporate a variety of authentic sources including primary source documents, photographs, and authentic data sets. Students regularly engage in speaking and writing about scientific phenomena and engineering solutions using authentic sources. Materials address the necessity of using scientific evidence to support ideas. There is variability in the tasks that students are

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			required to execute. The 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, but only after students first have the opportunity to build conceptual understanding of the term.
II: Additional Criteria of Superior Quality[3]	5. Learning Progressions	**Yes**	The lessons within and across each unit are organized to support learning through a natural progression. Students engage with and build understanding of the three dimensions of the standards at increasing levels of complexity and sophistication and engage in a coherent progression of learning that is clear, organized, and coordinated over time. Students apply mathematical thinking when applicable. Across the majority of the materials, students are not introduced to math skills that go beyond the Grade 6 Louisiana Student Standards for Mathematics.
	6. Scaffolding and Support	**Yes**	Separate teacher support materials are provided. Appropriate suggestions and materials are provided for differentiated instruction supporting varying student needs at the unit and lesson level.
	7. Usability	**Yes**	Text sets (when applicable), laboratory, and other scientific materials are readily accessible through vendor packaging. Materials help students build an understanding of standard operating procedures in a science laboratory and

[3] Must score a "Yes" for all Additional Criteria of Superior Quality to receive a Tier I rating.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			include safety guidelines, procedures, and equipment. The total amount of content is viable for a school year.
	8. Assessment	**Yes**	Multiple types of formative and summative assessments are embedded into content materials and assess the learning targets. Assessment items and tasks are structured on integration of the three dimensions and include opportunities to engage students in applying understanding to new contexts. Scoring guidelines and rubrics align to performance expectations and incorporate criteria that are specific, observable, and measurable.
FINAL DECISION FOR THIS MATERIAL: **Tier 1, Exemplifies quality**			

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: **Activate Learning Certified Version OpenSciEd** Grade/Course: **7**

Publisher: **Activate Learning** Copyright: **2022**

Overall Rating: **Tier 1, Exemplifies quality**

Tier 1, Tier 2, Tier 3 **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	
8. Assessment	

To evaluate instructional materials for alignment with the standards and determine tiered rating, begin with **Section I: Non-negotiable Criteria**.

- Review the **required**[1] Indicators of Superior Quality for each **Non-negotiable** criterion.
- If there is a "Yes" for all **required** Indicators of Superior Quality, materials receive a "Yes" for that **Non-negotiable** criterion.
- If there is a "No" for any of the **required** Indicators of Superior Quality, materials receive a "No" for that **Non-negotiable** criterion.
- Materials must meet **Non-negotiable** Criteria 1 and 2 for the review to continue to **Non-negotiable** Criteria 3 and 4. Materials must meet all of the **Non-negotiable** Criteria 1-4 in order for the review to continue to Section II.
- If materials receive a "No" for any **Non-negotiable** criterion, a rating of Tier 3 is assigned, and the review does not continue.

If all Non-negotiable Criteria are met, then continue to **Section II: Additional Criteria of Superior Quality.**

- Review the **required** Indicators of Superior Quality for each criterion.
- If there is a "Yes" for all **required** Indicators of Superior Quality, then the materials receive a "Yes" for the additional criteria.
- If there is a "No" for any **required** Indicator of Superior Quality, then the materials receive a "No" for the additional criteria.

Tier 1 ratings receive a "Yes" for all Non-negotiable Criteria and a "Yes" for each of the Additional Criteria of Superior Quality.
Tier 2 ratings receive a "Yes" for all Non-negotiable Criteria, but at least one "No" for the Additional Criteria of Superior Quality.
Tier 3 ratings receive a "No" for at least one of the Non-negotiable Criteria.

[1] **Required Indicators of Superior Quality** are labeled "**Required**" and shaded yellow. Remaining indicators that are shaded white are included to provide additional information to aid in material selection and do not affect tiered rating.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
SECTION I: NON-NEGOTIABLE CRITERIA OF SUPERIOR QUALITY **Materials must meet Non-negotiable Criteria 1 and 2 for the review to continue to Non-negotiable Criteria 3 and 4. Materials must meet all of the Non-negotiable Criteria 1-4 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 (SEP), crosscutting concepts (CCC), and disciplinary core ideas (DCI) in an integrated manner to support deeper learning.	**Yes**	The instructional 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 materials integrate the Science and Engineering Practices (SEP), Crosscutting Concepts (CCC), and Disciplinary Core Ideas (DCI) to support deeper learning. In the Matter Cycling and Photosynthesis unit, students engage in a series of science and engineering practices to develop knowledge about where matter and energy come from in plants. In Lesson 1, students explore breakfast foods and generate questions (SEP, Asking Questions and Defining Problems) about food molecules in plants, and use an Energy and Matter lens (CCC) to develop initial models (SEP, Developing and Using Models) to describe how plants obtain food molecules (DCI, MS.LS1C.a). In Lessons 2-8, students engage in Planning and Carrying Out Investigations (SEP), Analyzing and Interpreting Data (SEP), obtaining information from scientific texts (SEP, Obtaining, Evaluating, and Communicating Information), and constructing and comparing arguments based on evidence (SEP, Engaging in

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			Argument from Evidence) to determine where plants get the Energy and Matter (CCC) required for chemical reactions to make glucose (DCI, MS.LS1C.a), the source of food calories (DCI, MS.PS3D.a) during photosynthesis. Students use a simulation in one of the investigations (SEP, Planning and Carrying Out Investigations) in Lesson 6 to look at molecules going into and coming out of leaves to figure out what happens in leaves that allows plants to make food molecules. The students conduct experiments in the simulation and analyze the data (SEP, Analyzing and Interpreting Data) to explain how water, carbon dioxide, and the chloroplast work together to form new molecules (DCI, MS.PS3D.a) and revise their initial models (SEP, Developing and Using Models) to show the flow of Energy and Matter (CCC) that allows plants to obtain food. In Lessons 9-13, students conduct additional investigations (SEP, Planning and Carrying Out Investigations) and utilize models to develop ideas about the flow of Energy and Matter (CCC) in Earth's systems, such as the way that plants and other organisms obtain energy from food molecules through cellular respiration (DCI, MS.LS1C.c), and the role of decomposers in the recycling matter and energy. These ideas culminate in Lessons 14 and 15 with a fully developed model (SEP, Developing and Using Models) to explain the cycling of Energy and Matter

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			(CCC) through the rearrangement of atoms (DCI, MS.LS1C.b) among inputs and outputs in a system (CCC, Systems and System Models) of living and nonliving components. In the Chemical Reactions and Matter unit, students engage with the chemical makeup of bath bombs throughout the unit by creating and revising models (SEP, Developing and Using Models) of their findings to demonstrate how their learning has progressed and repeatedly looking for Patterns (CCC) in chemical make-up of bath bombs that could explain the formation of gas bubbles when bombs are placed in water (DCI: MS.PS1B.a). In Lesson 3, students engage in Planning and Carrying Out Investigations (SEP) with Bath Bomb ingredients to help further explore where gas bubbles come from when the bath bombs are dropped into water. Students begin by Analyzing and Interpreting Data (SEP) for bath bombs, both store-bought and homemade, to see if there are Patterns (CCC) found across all ingredient lists. Students then test each ingredient individually (SEP, Planning and Carrying out Investigations) to see if they create gas bubbles when mixed with water (DCI, MS.PS1B.a). In the Weather, Climate, and Water Cycling unit, students observe and investigate what causes hail storms and other storms (DCI, MS.ESS2D.a, MS.ESS2C.b) by analyzing weather data to construct explanations and by modeling

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			the transfer of energy in the system at multiple scales (SEP, Analyzing and Interpreting Data, Constructing Explanations, Developing and Using Models; CCC, Systems and System Models, Energy and Matter, Scale, Proportion, and Quantity).
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 a coherent sequence of learning a majority of the time. Phenomena provide students with authentic opportunities to ask questions and define problems, as well as purpose to incrementally build understanding through the lessons that follow.	**Yes**	Observing and explaining phenomena and designing solutions provide the purpose and opportunity for students to engage in learning a majority of the time. Phenomena in the form of common experiences at the beginning of each unit spark students to generate questions and define problems to motivate learning about the core ideas of the unit, and this provides purpose for students to engage in the investigations and lessons that follow as they work towards figuring out the phenomenon. Each unit starts with a real concept and has a question intended to be answered throughout the unit. In the Thermal Energy unit, Lesson 1, students explore the phenomenon of liquids remaining cold longer in some types of cups than others. A short video clip shows how the red food coloring in a peppermint candy dissolves at different rates in hot, warm, and cold water. Students generate an initial model of the cup system and brainstorm ideas for investigations to test which cup types will keep liquids cold longer. In Lesson 2, students choose their materials and methods of investigation to discover

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			which types of cups, such as paper, styrofoam, and plastic, and the design types of those cups that will allow less transfer of energy from the cold liquid inside the cup to the warmer air outside of the cup. Students document their findings as well as share and analyze data for patterns to rank the cups by performance and identify important features that might play a role in the rankings. In Lessons 3-5, students continue to plan and conduct investigations to explore different claims about the cup system. In Lessons 6-14, students explore the transfer of energy within the cup system at the particle level through modeling, simulations, and investigations to explain the relationship between energy and temperature within the cup system. Lessons 15-17 provide students the opportunity to apply their learning about the cup system in an engineering design challenge where they create and test cup systems designed to keep liquids cold. The Chemical Reactions & Matter unit introduces students to the phenomenon of bubbles created when a bath bomb is placed in water. This helps set the stage for the overarching student question, “How can we make something new that was not there before?” Students repeatedly return to this phenomenon throughout the unit as they investigate where the gas is coming from, the make-up of the gas, and the chemical processes

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			that lead to its formation to explain the reaction of the bath bomb in water In the Matter and Photosynthesis unit, students begin with remembering a meal they ate and tasting maple syrup. This provides a common experience for students to begin asking questions about what is in food. Throughout the unit, students analyze nutritional data for patterns, conduct and series of investigations, explore the make-up of food on the molecular level, and create and revise models to describe the cycling of matter and energy to explain where our food comes from.
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**	The majority (12 out of 16) of the Louisiana Student Standards for Science are incorporated to the full depth of the standards. LSSSS 7-MS-LS1-6, 7-MS-ESS2-4, and 7-MS-LS1-3 are fully addressed with the exception of one DCI component. For 7-MS-LS1-6 and 7-MS-ESS2-4, the DCI that is not addressed is the Louisiana-specific component: Louisiana's Natural Resources-Renewable resources have the ability to self-maintain due to the processes of photosynthesis (DCI, MS.EVS1A.a). For 7-MS-LS1-3, the DCI component not addressed is: Information Processing - Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. The signals are then processed in the brain, resulting in immediate

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			behaviors or memories (DCI, MS.LS1D.a) Additional standards that are not fully addressed in the materials include: 7-MS-ESS3-5, 7-MS-LS3-2, 7-MS-LS4-4 and 7-MS-LS4-5. While DCIs from the standards listed are not integrated into the materials, identified SEPs and CCC are often integrated and explored throughout multiple units.
	Required **3b)** Science content is **accurate**, reflecting the most current and widely accepted explanations.	**Yes**	All reviewed content is accurate, up-to-date, and aligned with the most current and widely accepted explanations. No evidence of incorrect or out-of-date science explanations could be found. In the Weather, Climate & Water Cycling unit, Lesson 14, students use a collection of videos and authentic weather data to work toward investigating the question, "Why does a lot of hail, rain, or snow fall at some times and not others?" These include a weather report from 2019, authentic videos of hail events, and a Hail Frequency Map from the National Weather Service. In the Matter and Photosynthesis unit, students read "Stevia," an example of up-to-date content with information from the U.S. National Library of Medicine's "The Journal of Nutrition" from 2018.
	3c) In any one grade or course, instructional materials spend **minimal time on content outside** of the course, grade, or grade-band.	**Yes**	Instructional materials spend minimal time on content outside of the course, grade, or grade-band. Time spent on material outside of the grade serves to maintain coherence in relation to the phenomenon. For example, Metabolic

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			Reactions builds toward MS-LS1-5. While this is not a LSSS, it is important for students to have some understanding of how environmental and genetic factors influence the growth of organisms. The unit does not make this standard a main focus of the unit but does have students consider these factors as possible reasons why their student patient could be ill at this point in her life.
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 regularly engage with authentic sources that represent the language and style used and produced by scientists. The instructional materials incorporate a variety of authentic sources including primary source documents, photographs, authentic data sets, and readings with information from scientific journals. In the Matter Cycling and Photosynthesis unit, students read grade-level appropriate content adapted from the article, "How do Scientists Measure Food" from Scientific American. In the Thermal Energy unit, students analyze data collected from hands-on scientific investigations as well as computer simulations. In Lessons 1-10, students investigate the relationship between energy changes and temperature change by gathering evidence from different types of cups, then utilize a computer simulation in Lessons 11-13 to explore the rates of movement of molecules when they are hot and when they are cold. The remainder of the unit allows students to use the acquired

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			information to design and test a cup that deters the transfer of energy and keeps a liquid cold.
	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 using authentic sources. Materials address the necessity of using scientific evidence to support ideas. In all units, students regularly engage with Driving Question Boards (DQB), allowing all students to generate questions that guide their learning experience. In addition to engaging in productive science talk to generate questions, students also incrementally develop the ability to respectfully argue from evidence by building understanding and coming to a consensus in Scientist Circles. Students utilize a Scientist Circle in Lesson 13 of the Weather, Climate & Water Cycling unit to come to a consensus for the 'Gotta-Have-It Checklist' of necessary components for their class model to explain hail. The students also return to their DBQ to take stock of their answered and unanswered questions. Students also regularly engage in turn and talk with peers. In the Matter Cycling and Photosynthesis unit, students discuss what evidence would help prove the food molecule sources in the hydroponics system. Students also frequently write in a science notebook for each unit. In the Thermal Energy unit, Lesson 1, students jot their ideas for how

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			to collect evidence to investigate a claim about which cup keeps a drink colder longer, enter observed data into a chart for the change in temperature over time for two different types of cold cups of liquid, and raw initial models in their notebooks to illustrate their observations.
	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. Within each module, students are asked to produce and revise models of the anchoring phenomenon. Across the materials, students regularly engage in a variety of tasks, such as constructing written explanations, planning and conducting investigations, making observations and collecting data with simulations, reading scientific texts, and designing using criteria and constraints. In the Weather, Climate, and Water Cycling unit, students engage with the phenomenon through hands-on lab activities, videos, images, data sets, readings, and computer interactives/simulations. In Lesson 1, students observe video clips of hail falling in different areas of the United States on different days and generate questions about what can cause different types of precipitation. In Lesson 2, students look for patterns in data and images of hail events to create explanations. Later, in Lesson 9, students engage with text about cloud formation, patterns, and composition to determine how they are

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			related to weather phenomena. In the Matter Cycling and Photosynthesis unit, Lesson 2, students answer the question "Do plants get food molecules by taking them in?" They do this with a wet lab where students observe and record data and test plants for different organic molecules. They study this hydroponic system based on inputs to see what is going into the plants from below the surface.
	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 a coherent sequence of authentic science sources that build scientific vocabulary and knowledge over the course of study. Vocabulary is addressed as needed, but only after students have first had the opportunity to build conceptual understanding of the term. This is done through building a word wall and words the students earn, encounter, or reinforce. There is a "Guidance for Developing your Word Wall" in each teacher's section. Students discuss and investigate the phenomenon without vocabulary frontloading. Once they develop an understanding of a concept through investigation, they engage with applicable scientific terms by creating a working definition as a class and posting it to the Word Wall. It is recommended to place a visual representation near the word to help students develop a connection between the concept and the vocabulary word. In the Ecosystem Dynamics unit,

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			Lesson 7, after students engage with a Story Map and participate in an Initial Ideas Discussion which surfaces the term "population," teachers add the term to the Word Wall and encourage students to continue to use it during the discussions that follow.
Section II: Additional Criteria of Superior Quality			
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 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 lessons within and across each unit are organized to support learning through a natural progression. Students engage with and build understanding of the three dimensions of the standards at increasing levels of complexity and sophistication and engage in a coherent progression of learning that is coordinated over time, clear, and organized. Teacher guidance documents begin with the unit overview and storyline. Through this storyline, it is evident that student-driven investigations and discovery drive how students figure out things through the unit. This clearly outlines what the students will figure out and how they will represent what they learn. Students use all three dimensions throughout the lessons and lesson sets. There is also a section of background knowledge that provides teacher guidance if units are taught out of sequence to support student mastery of the Performance Expectations and maintain coherence. In the Chemical Reactions unit, students begin by observing gas formation from dropping a

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			bath bomb in water and then spend the rest of the unit progressively researching the ingredients in bath bombs and testing those ingredients to see which ones would create the gas. Students develop and revise models of what is happening inside the bath bombs at a level they are unable to see with the naked eye to build a gradual understanding of how different substances react when combined. Students gather evidence and record it on their model and progress tracker then use the evidence to construct explanations and develop arguments later in the unit. In the Thermal Energy unit, students compare and contrast the insulative properties of two different cups to determine how energy is being transferred into the drink, changing its original temperature. Students apply their findings to a design challenge to develop a drink cup that can perform as well or better than the cups they investigated. As they begin their investigations, they build upon the Grade 5 LSSS that explains the particle movement of solids, liquids, and gasses as they create models to illustrate the concept. They coherently build understanding of the Physical Science disciplinary domain for thermal energy transfer. The practices of Developing and Using Models and Planning and Carrying Out Investigations build within the unit as students plan and execute investigations that test how the parts of the cup system

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			allow matter and energy to flow in and out of the system. Students investigate and then create models based on their findings in Lessons 1-10, plan and carry out investigations in Lessons 11-15, and design the cup prototype in Lessons 16-18 (DCI, MS-PS3-3). The practices of Constructing Explanations and Designing Solutions and Engaging in Argument from Evidence as well as disciplinary content from DCI MS-PS4-2 and MS-PS3-5 are developed as students engage in scientific seminars and group discussions to present their findings of their energy movement investigations and discuss and consider the models. Cross-cutting concepts Systems and System Models, Energy and Matter, Structure and Function are also integrated and developed by models of the cup system that illustrate how the structure allows or inhibits the flow of energy and matter in and out of the system. Students revise their models to reduce the transfer of energy and apply their findings about how certain cup features can slow the movement of energy into the system to allow the liquid within the cup to remain cold as long as possible.
	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. Across the majority of the materials, students are not introduced to math skills that go beyond the Grade 6 Louisiana Student Standards for Mathematics (LSSM). Students regularly apply mathematics skills and

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			understanding to engage in Using Mathematics and Computational Thinking (SEP) appropriately in the context of their learning. In the Chemical Reactions unit, students build towards the DCI PS1.B related to the total numbers of each type of atom related to the mass which requires students to calculate the mass before and after a chemical reaction to ensure they are equal. The Grade 7 LSSS addressed by this unit includes LSSM 7.RP.A.2.a and 7.RP.A.2.b in Lesson 8 where students measure, graph, and calculate density from mass and volume data. In the Weather, Climate, and Water Cycling unit, Lesson 2, students use ratios to generate rates reflecting the number of storms per year in an area and wind speeds in miles per hour. Students apply this learning to lessons that follow in the unit. Expected previous math knowledge is from LSSM 6.RP.A.2. In Lesson 16, students calculate differences in x-values and y-values from data points found on graphs illustrating air temperature vs. amount of water vapor in the air with air saturations of 100% and 50% relative humidity. Expected previous math knowledge is from LSSM 6.NS.C.8.
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	**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	**Yes**	There are separate teacher support materials provided. Support materials include an extensive teacher book, and within each lesson, the following is provided: a Teacher Background section (scientific background about the

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
using multiple, varied experiences to build scientific thinking. ☒ Yes ☐ No	in the science classroom (e.g. conversation guides, sample scripts, rubrics, exemplar student responses).		Disciplinary Core Ideas of the unit), 3-D Strategies sections that detail explicit techniques for highlighting and SEPs, DCIs, and CCCs further, and sample prompts and conversation guides for class discussions. The teacher handbook breaks down the instructional flow for each unit. Each unit in the teacher manual has step-by-step lesson plans that include support for meeting individual students' needs, sample questions, talking points, and "listen-fors," as well as possible preconceptions. There are step-by-step PowerPoints for each lesson as well. The digital and pdf teacher manual includes a Unit Overview containing the following information: what students are expected to learn through the investigation process; Performance Expectations addressed by the unit; unit Storyline containing the Lesson number, focus question, navigation, and images that show how students will engage with the phenomena. There are also Teacher Background Knowledge sections about Lab Safety Requirements, Anchor Phenomenon information, dimensions developed in context, unit structure, Scope and Sequence guidance, students' prior knowledge, and math connections.
	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	**Yes**	Appropriate suggestions and materials are provided for differentiated instruction supporting varying student needs at the unit and lesson level. Teacher-facing materials include guidance

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
	options, suggestions for addressing common student difficulties to meet standards, etc.).		within all detailed lesson descriptions designed for supporting engagement with SEPs and supporting universal design for learning. Optional lessons and activities are included throughout the units. Each unit overview provides a pacing guide that points to additional activities a teacher may choose to include at key points for students who need additional experiences and time developing core ideas of the unit. Lesson materials also include diverse learner supports. For example, in the Chemical Reactions unit, Lesson 3, Section 7, the Attending to Equity section points out an opportunity in the lesson to build literacy skills and support emerging multilingual learners or struggling readers. In the Metabolic Reactions unit, Lesson 5, Section 9, the Strategies for Building Understandings Discussion section helps the teacher guide the students in using investigation information to explain questions from previous lessons. In Thermal Energy, within the Teacher Edition, Lesson 18 includes an option for an alternative activity suggested for use with students who need additional experience with the phenomenon to grasp the concept or for students who master the content of the lesson quickly to provide them with further exploration to create more advanced explanations.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
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 (when applicable), laboratory, and other scientific materials are readily accessible through vendor packaging. The information needed for activities are readily available. The teacher portal section of the website allows teachers to see student and teacher books, and gives access to all the student worksheets, and slides for each lesson. Kits are made for each unit, materials list provide what is needed for investigations. In the Matter Cycling and Photosynthesis unit, the Unit Overview Materials includes a section for advanced preparation needed with clear instructions and timeframes. In Weather, Climate, and Water Cycling, most materials are provided in the kits. The materials to be obtained by the teacher, or locally sourced, are easily obtainable and reasonable to have on hand in a science classroom, such as rubber bands, rulers, plastic spoons, and paper towels. In the Metabolic Reactions unit, Lesson 3 includes safety, disposal, and storage information for the Iodine and Benedict's solutions that will be used during the lesson.
	Required **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**	Materials help students build an understanding of standard operating procedures in a science laboratory and include safety guidelines, procedures, and equipment. Science Lab Safety guidance and guidelines are provided for teachers and for the students and their parents. In the Thermal Energy unit of the Teacher

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			Edition, teacher background knowledge for lab safety in the science classroom is provided. With each lesson, additional safety suggestions are found relevant to the materials used in the investigations as well as information about whether they are safe to be used with students or if it is a teacher-only activity. In the Chemical Reactions unit, Lesson 5, the Safety Precaution reminds the teacher to make sure everyone wears safety goggles, to have a glass of water near to discard burnt matches and splints, and that anyone with long hair should tie it back to keep it away from the open flame.
	7c) The total amount of content is **viable** for a school year.	**Yes**	The total amount of content is viable for a school year. The six units combined contain 104 lessons ideally taught over 196 days. It is possible to cover the total content in a school year if units are condensed or shortened using guidance in the teacher manual.
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 embedded into content materials and assess the learning targets. Assessments are integrated into the lessons and allow students to demonstrate progress throughout the unit. Formative assessment opportunities within lessons include but are not limited to written explanations, questions, discussion prompts, and models. An assessment System Overview is provided for each unit and outlines both formative and

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			summative assessment opportunities, students' self-assessments, and lesson-by-lesson assessment opportunities with the three dimensions highlighted. There are also task assessments in the form of design challenges and presentations. The Matter Cycling and Photosynthesis unit includes many different formative and summative assessments. For example, Lessons 1, 8, and 15 contain opportunities for students to demonstrate understanding through modeling. Lessons 4, 11, 13, 14, and 15 all include opportunities for assessing student progress with communicating scientifically in the form of explanations and arguments. There are also many opportunities to gauge student understanding through discussions including but not limited to Building Understandings discussions in Lessons 2, 7, and 13, as well as small group discussions in Lessons 6 and 12.
	Required **8b)** Assessment items and tasks are structured on integration of the **three dimensions** and include opportunities to engage students in applying understanding to new contexts.	**Yes**	Assessment items and tasks are structured on integration of the three dimensions and include opportunities to engage students in applying understanding to new contexts. Within each lesson of the units, at least one Lesson Level Performance Expectation (LLPE) is included. LLPEs are three-dimensionally structured to include the SEP, DCI, and CCC. The Unit assessments of each unit integrate SEPs in assessments as students use data, construct explanations, and develop

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			models to address the anchor phenomena. The Teacher Guide for each lesson within the Lesson-by-Lesson Assessment Opportunities section lists the LLPEs for each lesson. The SEP, DCI, and CCC that correspond are color-coded to readily identify their alignment to the assessments used with each lesson. In the Matter Cycling and Photosynthesis unit, Lesson 15, End-of-Unit assessment, students create a model (SEP, Developing and using Models) to explain the interactions between components in the system (CCC: Systems and System Models) as they relate to matter and energy inputs and outputs (DCI, MS.PS3D.a). Students then explain (SEP, Constructing Explanations) the change in inputs and outputs over time within the system (CCC, Energy and Matter, Systems and System Models) as the whale fall is consumed given seafloor conditions related to plants, light, and oxygen (DCI, MS.LS1C.a). The whale fall scenario allows students to transfer the knowledge they developed by investigating where food comes from and where it goes throughout the unit.
	8c) Scoring guidelines and rubrics **align** to performance expectations, and incorporate criteria that are specific, observable, and measurable.	**Yes**	Scoring guidelines and rubrics align to performance expectations and incorporate criteria that are specific, observable, and measurable. All units include answer keys and rubrics for major assessments as well as criteria such as look fors/listen fors that call out all three dimensions of performance expectations.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			In the Thermal Energy unit, Lesson 14, the Icing Injuries assessment includes an answer key and rubric which are intended to identify student understanding about the mechanisms that drive energy transfer and the direction of the transfer between differences in temperature. The assessment scoring guide specifies in which lessons learning occurred and the level of understanding evidenced by acceptable responses. The Weather, Climate, and Water Cycling unit includes answer keys and rubrics for the summative Hurricane Assessment Task and the Rainforest Climate Assessment Task found in the Teacher Portal under the tab Teaching the Lesson Resources. These describe what student understanding and misunderstandings might look like in reference to student-created map markings, drawings, and responses.

FINAL EVALUATION
Tier 1 ratings receive a "Yes" for all Non-negotiable Criteria and a "Yes" for each of the Additional Criteria of Superior Quality.
Tier 2 ratings receive a "Yes" for all Non-negotiable Criteria, but at least one "No" for the Additional Criteria of Superior Quality.
Tier 3 ratings receive a "No" 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-negotiable Criteria of Superior Quality[2]	1. Three-dimensional Learning	**Yes**	The instructional materials are designed so that students develop scientific content knowledge and scientific skills through interacting with the three dimensions of

[2] Must score a "Yes" for all Non-negotiable Criteria to receive a Tier I or Tier II rating.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			the science standards. The majority of materials integrate the Science and Engineering Practices (SEP), Crosscutting Concepts (CCC), and Disciplinary Core Ideas (DCI) to support deeper learning.
	2. Phenomenon-Based Instruction	**Yes**	Phenomena in the form of common experiences at the beginning of each unit spark students to generate questions and define problems to motivate learning about the core ideas of the unit, and this purpose for students to engage in the investigations and lessons that follow as they work towards figuring out the phenomenon.
	3. Alignment & Accuracy	**Yes**	The majority (12 out of 16) of the Louisiana Student Standards for Science are incorporated to the full depth of the standards. All reviewed content is accurate, up-to-date, and aligned with the most current and widely accepted explanations. Instructional materials spend minimal time on content outside of the course, grade, or grade-band.
	4. Disciplinary Literacy	**Yes**	Students regularly engage with authentic sources that represent the language and style used and produced by scientists. The instructional materials incorporate a variety of authentic sources including primary source documents, photographs, authentic data sets, and readings with information from scientific journals. Students regularly engage in speaking and writing about scientific phenomena and engineering solutions using authentic sources. Materials address the necessity of

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			using scientific evidence to support ideas. There is variability in the tasks that students are required to execute. The 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, but only after students have first had the opportunity to build conceptual understanding of the term.
II: Additional Criteria of Superior Quality[3]	5. Learning Progressions	**Yes**	The lessons within and across each unit are organized to support learning through a natural progression. Students engage with and build understanding of the three dimensions of the standards at increasing levels of complexity and sophistication and engage in a coherent progression of learning that is coordinated over time, clear, and organized. Students apply mathematical thinking when applicable. Across the majority of the materials, students are not introduced to math skills that go beyond the Grade 7 Louisiana Student Standards for Mathematics.
	6. Scaffolding and Support	**Yes**	There are separate teacher support materials provided. Appropriate suggestions and materials are provided for differentiated instruction supporting varying student needs at the unit and lesson level.
	7. Usability	**Yes**	Text sets (when applicable), laboratory, and other scientific materials are readily

[3] Must score a "Yes" for all Additional Criteria of Superior Quality to receive a Tier I rating.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			accessible through vendor packaging. Materials help students build an understanding of standard operating procedures in a science laboratory and include safety guidelines, procedures, and equipment. The total amount of content is viable for a school year.
	8. Assessment	**Yes**	Multiple types of formative and summative assessments are embedded into content materials and assess the learning targets. Assessment items and tasks are structured on integration of the three dimensions and include opportunities to engage students in applying understanding to new contexts. Scoring guidelines and rubrics align to performance expectations and incorporate criteria that are specific, observable, and measurable.
FINAL DECISION FOR THIS MATERIAL: **Tier 1, Exemplifies quality**			

DEPARTMENT of EDUCATION
Louisiana Believes

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: **Activate Learning Certified Version OpenSciEd** Grade/Course: **8**

Publisher: **Activate Learning** Copyright: **2022**

Overall Rating: **Tier 1, Exemplifies quality**

Tier 1, Tier 2, Tier 3 **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	
8. Assessment	

To evaluate instructional materials for alignment with the standards and determine tiered rating, begin with **Section I: Non-negotiable Criteria**.

- Review the **required**[1] Indicators of Superior Quality for each **Non-negotiable** criterion.
- If there is a "Yes" for all **required** Indicators of Superior Quality, materials receive a "Yes" for that **Non-negotiable** criterion.
- If there is a "No" for any of the **required** Indicators of Superior Quality, materials receive a "No" for that **Non-negotiable** criterion.
- Materials must meet **Non-negotiable** Criteria 1 and 2 for the review to continue to **Non-negotiable** Criteria 3 and 4. Materials must meet all of the **Non-negotiable** Criteria 1-4 in order for the review to continue to Section II.
- If materials receive a "No" for any **Non-negotiable** criterion, a rating of Tier 3 is assigned, and the review does not continue.

If all Non-negotiable Criteria are met, then continue to **Section II: Additional Criteria of Superior Quality.**

- Review the **required** Indicators of Superior Quality for each criterion.
- If there is a "Yes" for all **required** Indicators of Superior Quality, then the materials receive a "Yes" for the additional criteria.
- If there is a "No" for any **required** Indicator of Superior Quality, then the materials receive a "No" for the additional criteria.

Tier 1 ratings receive a "Yes" for all Non-negotiable Criteria and a "Yes" for each of the Additional Criteria of Superior Quality.
Tier 2 ratings receive a "Yes" for all Non-negotiable Criteria, but at least one "No" for the Additional Criteria of Superior Quality.
Tier 3 ratings receive a "No" for at least one of the Non-negotiable Criteria.

[1] **Required Indicators of Superior Quality** are labeled "**Required**" and shaded yellow. Remaining indicators that are shaded white are included to provide additional information to aid in material selection and do not affect tiered rating.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
SECTION I: NON-NEGOTIABLE CRITERIA OF SUPERIOR QUALITY **Materials must meet Non-negotiable Criteria 1 and 2 for the review to continue to Non-negotiable Criteria 3 and 4. Materials must meet all of the Non-negotiable Criteria 1-4 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 (SEP), crosscutting concepts (CCC), and disciplinary core ideas (DCI) in an integrated manner to support deeper learning.	**Yes**	The instructional 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 integrate the Science and Engineering Practices (SEP), Crosscutting Concepts (CCC), and Disciplinary Core Ideas (DCI) to support deeper learning. In the Rock Cycling and Plate Tectonics unit, students develop knowledge to explain how mountain formations are the result of energy flowing and matter cycling within and among the planet's systems. In Lesson 2, students analyze data (SEP, Analyzing and Interpreting Data) using the Seismic Explorer to determine if there is a Pattern (CCC) with greater earthquake activity at mountains of increasing elevation (DCI, MS.ESS2A.b). In Lesson 5, students develop an argument based on evidence (SEP, Constructing Explanations) about the Cause and Effect (CCC) relationship between plate movement and mountain movement (DCI, MS.ESS2A.b). Students look for Patterns (CCC) by examining GPS data (SEP, Analyzing and Interpreting Data) to determine land movement around Mt. Mitchell and use a physical model (SEP, Developing Using Models) to

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			demonstrate that the entire North American plate moves at a constant speed and in a specific direction (DCI, MS.ESS1C.c and MS.ESS2B.a). In the Chemical Reactions and Energy unit, students engage in a variety of scientific practices to develop a heater to incubate turtle eggs. In Lesson 3, students investigate (SEP, Planning and Carrying Out Investigations) different reactants to determine which chemical reaction will increase temperature the most. After analyzing the data (SEP, Analyzing and Interpreting Data) students create a model (SEP, Developing and Using Models) of the energy transfer during the chemical reaction. (DCI, MS.PS1B.c and MS.PS1A.a; CCC, Energy and Matter; Scale, Proportion, Quantity). In Lesson 6, students use information gathered from previous lessons to redesign a flameless heater to better transfer energy from chemical processes to heat food. They develop models and prototypes using criteria and constraints then plan for design testing. This process culminates in Lesson 7, where students critique different designs of flameless heaters and determine the most promising design characteristics (SEP, Designing Solutions; CCC, Energy and Matter, Systems and System Models; DCI, MS.ETS1.C.a). In the Natural Selection and Common Ancestry unit, students engage in a variety of activities to explain changes of life forms throughout the history of life

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			on Earth. In Lesson 4, students analyze fossil data from Reference: Analyzing and Interpreting Fossil Data then share their interpretation of the data with their classmates. Students then compare penguin fossil body structure with today's variation of penguins and discuss why they believe these variations happened (SEP, Mathematical and Computational Thinking, Analyzing and Interpreting Data; CCC, Scale, Proportion, and Quantity, DCI, MS.LS4A.a). In Lesson 5, students analyze data from other organisms to look for patterns across fossils and modern organisms. They sort organisms by structures and by environments then work in groups to create a model that demonstrates the connections between the organisms. Students then share their models and record the patterns they notice across organisms (SEP, Developing and Using Models, Analyzing and Interpreting Data; CCC, Patterns; DCI, MS.LS4A.a and MS.LS4A.b).
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 a coherent sequence of learning a majority of the time. Phenomena provide students with authentic opportunities to ask questions and define problems, as well as purpose to incrementally build understanding through the lessons that follow.	**Yes**	Observing and explaining phenomena and designing solutions provide the purpose and opportunity for students to engage in learning a majority of the time. Phenomena in the form of common experiences at the beginning of each unit spark students to generate questions and define problems to motivate learning about the core ideas of the units, and this provides purpose for students to engage in the investigations and lessons that

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			follow as they work towards figuring out the phenomena. Each unit starts with a big question about the phenomenon that becomes the focus of the unit. In the Chemical Reactions and Energy unit, students engage in several investigations to answer the question, "How can we use chemical reactions to design a solution to a problem?" The lessons are designed to build students' knowledge of chemical reactions and heat production to develop sea turtle incubators. For example in Lesson 2, students investigate the question, "How do heaters get warm without a flame?" by revising a previous investigation to discover how hot flameless heaters and hand warmers get and collect data to support the idea that a chemical reaction causes the devices to heat up. Then, in Lesson 3, students engage in activities to answer the question, "What other chemical reactions could we use to heat up food?" In Lessons 5-9, students design, evaluate and redesign their homemade flameless heaters. Students use these heaters to answer the final question in Lesson 10, "How can we decide between competing designs?" Within this lesson, students develop a design for sea turtle incubators. In the Rock Cycling and Plate Tectonics unit, students engage in several activities to answer the anchor phenomenon question, "What is causing Mt. Everest and other mountains to move, grow, or

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			shrink?” In an introduction to the unit, students read an excerpt about how Mt. Everest is getting taller and moving to the northeast over time. The students analyze data for four other mountains and infer that these mountains are also changing in elevation and shrinking. Students develop an initial model and generate questions, a list of related phenomena, and the information needed to determine what is happening to these mountains before they investigate the relationship between earthquakes and mountains in Lesson 2 and collect data using a Seismic Explorer. In order to conduct a deeper investigation of the correlation between earthquakes and mountain locations in Lesson 3, students develop models and gather data about the structure and composition of materials at and below the surface of the earth. In Lessons 4-6, students further investigate what happens below the surface to develop an understanding of tectonic plates and how they could cause movement and elevation changes in mountains. Lesson 9 leads students to look back at the Driving Question Board based on the anchor phenomena and determine which questions have been answered and what they still need to find out. They spend the next lessons exploring the locations of plates and mountain ranges over the course of Earth’s history. In Lessons 13-14, students work to answer a couple of lingering questions, “What

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			causes mountains to shrink in elevation?" and "How is there an exposed marine fossil on Mt. Everest?" to successfully generate an explanation for the anchor phenomenon. In the Genetics unit, students observe pictures of animals of the same species with very different musculature and ask questions about the extreme differences in the animals. The unit design provides the opportunity for students to answer the anchor phenomenon, "Why are living things different from one another?" In Lesson 4, students develop a consensus model about the structure of muscles and the cells that compose them in order to answer the question, "What is different about the food and exercise for cattle with extra-big muscles?" After discussing muscle structure, the lesson returns to the anchor phenomenon as students listen to an interview with a farmer who raises cattle with extra big muscles. In Lesson 5, students investigate the question, "Where do the babies with extra-big muscles get that trait variation?" Students develop a pedigree chart for cattle, predicting patterns of inheritance that determine the physical traits of the offspring.
Non-negotiable (only reviewed if Criteria 1 and 2 are met) **3. ALIGNMENT & ACCURACY:**	**Required** **3a)** The majority of the Louisiana Student Standards for Science are incorporated, to the full **depth of the standards**.	**Yes**	The materials incorporate the majority (14 out of 19) of the Grade 8 Louisiana Student Standards for Science (LSSS) to the full depth of the standards. The materials do not fully address following standards: 8-MS-PS 1-1, 8-MS-PS1-3, 8-

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
Materials adequately address the Louisiana Student Standards for Science. ☒ Yes ☐ No			MS-LS 1-4, 8-MS-ESS 3-1, and 8-MS-ESS3-3. While the materials do not integrate some Disciplinary Cores Ideas (DCIs) from the standards, identified Science and Engineering Practices (SEPs) and Crosscutting Concepts (CCCs) are often integrated and explored throughout multiple units. For LSSS 8-MS-PS 1-1, DCI MS.PS1A.e is not addressed. Several units support Developing and Using models in practice, including the Chemical Reactions and Energy, Rock Cycling and Plate Tectonics, and Genetics units. The Chemical Reactions and Energy unit integrates Scale, Proportion, and Quantity in depth. For LSSS 8-MS-PS1-3, DCI MS.PS1A.b is not addressed. Within all units, Obtaining, Evaluating, and Communicating Information is partially supported in practice by all units. Credibility and bias of information obtained is not addressed. The Genetics unit integrates Structure and Function in depth. For LSSS 8-MS-LS1-4, DCI MS.ESS1C.b is not addressed. Several units support Constructing Explanations and Designing Solutions in practice, including Rock Cycling and Plate Tectonics, Natural Resources and Human Impact, Genetics, and Natural Selection. All units integrate Patterns. For LSS 8-MS-ESS3-1, DCI MS.ESS3A.a is partially addressed, focusing only on water and air components, and DCI MS.EVS1A.b is not addressed. Several units support

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			Constructing Explanations and Designing Solutions in practice, including Rock Cycling and Plate Tectonics, Natural Resources and Human Impact, Genetics, and Natural Selection. Several units Cause and Effect in depth, including Rock Cycling and Plate Tectonics, Natural Resources and Human Impact, Genetics, and Natural Selection. For LSSS 8-MS-ESS3-3, DCIs MS.ESS3C.a, MS.ESS3C.b, and ETS.MS.1B.a are partially addressed, focusing only on the Carbon Cycle. Several units support Constructing Explanations and Designing Solutions in practice, including Rock Cycling and Plate Tectonics, Natural Resources and Human Impact, Genetics, and Natural Selection. Several units integrate Cause and Effect in depth, including Rock Cycling and Plate Tectonics, Natural Resources and Human Impact, Genetics, and Natural Selection.
	Required **3b)** Science content is **accurate**, reflecting the most current and widely accepted explanations.	**Yes**	All reviewed content is accurate, up to date, and aligned with the most current and widely accepted explanations. The materials did not include evidence of incorrect or out-of-date science explanations. Science content is up to date and based on current science educational practices. Students engage with problem solving, evidence based arguments, engineering practices, and hands-on learning activities to stimulate high order thinking. By “discovering” scientific principles, students take ownership of their learning. Lessons are geared to

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			supporting learners with multiple modalities. In the Natural Selection and Common Ancestry unit, Lesson 1, students watch live feeds of animals and analyze the behavior, structure, and environment of organisms. In the Student Edition, students use data from scientists leading their fields, such as Dr. Sara Bertelli and Sr. Ali Altimanaro. Throughout the Rock Cycling and Plate Tectonics unit, students use a Seismic Explorer with the most current data. In the Natural Resources and Human Impact unit, Lesson 1, students read headlines about flooding and droughts in the United States, including examples from the *Milwaukee Journal Sentinel* (2020) and *ABC News* (2019).
	3c) In any one grade or course, instructional materials spend **minimal time on content outside** of the course, grade, or grade-band.	**Yes**	Instructional materials spend minimal time on content outside of the course, grade, or grade-band. Time spent on material outside of the grade serves to maintain coherence in relation to the phenomenon or to build upon previous knowledge. For instance, the Natural Hazards unit's Teacher Edition alerts teachers of information students should bring from Grade 4 and revisit across the Grade 6-8 Band and provides teachers with the Scope and Sequence for the two previous grade levels. This information outlines students' prior knowledge and how to implement content when there are student learning gaps. In the Chemical Reactions and Energy unit, Lesson 2 and

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			Lesson 12 spend time reviewing content from the Grade 7 Cup Design unit, which addresses average kinetic energy of molecules. In the Natural Hazards unit, for students to understand how Tsunamis develop and move, they revisit wave properties taught in the Grade 6 Sound unit.
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 regularly engage with authentic sources that represent the language and style used and produced by scientists. The instructional materials incorporate a variety of authentic sources including primary source documents, photographs, and authentic data sets. In the Rock Cycling and Plate tectonics unit, Lesson 2, students watch videos of a Mt. Everest eruption and a Ridgecrest, CA Earthquake to predict causes for the disasters. Then students use the Seismic Explorer, either confirming or denying their initial predictions of the earthquake locations based upon the presence of potential mountains and ranges. In the Genetics unit, Lesson 9, students read two interviews from real farmers and an article titled “Raising Heavily Muscled Cattle to Reduce Environmental Impacts of Cattle” to explore the idea of selective breeding in cattle. Students explore a simulation which controls bird breeding in order to create individuals with selected-for trait variations. In the Natural Selection unit, Lesson 2, students analyze trait variation data from two resources: “Fossil evidence

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			for evolution of the shape and color of penguin feather" and "Paleogene equatorial penguins challenge the proposed relationship between biogeography, diversity, and Cenozoic climate change" (Proceedings of the National Academy of Sciences).
	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 using authentic sources. Materials address the necessity of using scientific evidence to support ideas. In all units, students regularly engage in Driving Question Boards, allowing all students to generate questions about real-world phenomena which help guide their learning experience. Materials address the necessity of using scientific evidence to support ideas. Students regularly engage in productive science talk to generate driving questions, build understanding, and come to consensus. They also present and revise designs, gather evidence from multiple sources, and explain findings. Students turn and talk with peers regularly. For example, in the Rock Cycling and Plate Tectonics unit, Lesson 2, Day 1, during the Talking Point, students make predictions and discuss evidence to support whether earthquakes caused Mt. Everest to increase in height or change locations. Then students make claims and gather evidence from observations on whether earthquakes can make changes to mountains. The Natural Hazards unit,

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			Lesson 1 introduces students to the anchor phenomena through text and videos about a 2011 tsunami triggered by an earthquake off the eastern coast of Japan which caused devastating loss of life and structural damage. Students develop initial engineering ideas intended to detect tsunamis, provide warning of their approach, and reduce their impact. Students think about what makes some engineering ideas more promising or challenging than others. Students then brainstorm other related natural hazards and share with peers, as well as ask questions to generate a list of data and information needed to better understand where these hazards occur and how people can prepare for them.
	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. Within each unit, students are asked to produce and revise models of the anchoring phenomenon. Across the materials, students regularly engaged in a variety of tasks, such as experimenting in labs, making observations from videos, reading headlines or articles, and conducting science simulations. In the Rock Cycle and Plate Tectonics unit, Lesson 1, students create an initial model to explain the reasons for changes in height and location of Mt. Everest; students will continue to revise these models throughout the unit. In Lesson 3, students investigate rocks to determine their properties. In Lesson 4,

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			students use a Seismic Explorer to locate earthquakes around the world. In Lesson 6, students create physical models to demonstrate how plates move. In the Chemical Reactions and Energy unit, Lesson 2, students revise an investigation to determine the level of heat for flameless heaters and hand warmers. Students collect data to support the idea that a chemical reaction causes the devices to heat up. Students research different ingredients and observe changes in the substances as the temperature rises to confirm that new substances are produced. Students then model energy transfer in the MRE using their evidence. In the Natural Hazards unit, Lesson 2, students analyze the data on the ArcGIS Story Map to determine patterns for tsunami locations. Then, in Lesson 3, students watch videos and analyze simulation models to observe what happens to water during a tsunami. In Lesson 8, students engage in a close reading protocol to gather information about the warning signals for a tsunami. Lastly, at the end of the unit, students design a community risk assessment for a natural disaster.
	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 a coherent sequence of authentic science sources that build scientific vocabulary and knowledge over the course of study. Vocabulary is addressed as needed, but only after students first have the

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			opportunity to build conceptual understanding of the term. The materials recommend students build a word wall for the words they earn, encounter, and reinforce, and provide "Guidance for Developing your Word Wall" in each teacher's section. The Rock Cycling and Plate Tectonics unit, Overview Materials explains how to introduce vocabulary words and the difference between earned and encountered words. The materials outline which lessons students encounter and earn specific words. For example, in Lesson 1, students earn the following vocabulary words: magnitude and earthquake. In Lesson 2, students encounter the following vocabulary words: earthquake depth, epicenter, causation, and correlation. In the Natural Hazards unit, Lesson 3, students use a NOAA model utilizing the words amplitude and epicenter. Although these are words from a previous year, students add the words to their word wall during the lesson discussion. In the Chemical Reactions and Energy unit, Lesson 3, Day 2, students add the words exothermic and endothermic to the word wall, but only after they have observed and developed a model for an exothermic reaction.
Section II: Additional Criteria of Superior Quality			
5. LEARNING PROGRESSIONS: The materials adequately address Appendix A: Learning Progressions.	**Required** **5a)** The overall organization of the materials and the development of disciplinary core ideas, science and	**Yes**	The lessons within and across each unit are organized to support learning through a natural progression. Students engage

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
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 the [Louisiana Student Standards for Math](). ☒ Yes ☐ No	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.		with and build understanding of the three dimensions of the standards at increasing levels of complexity and sophistication and engage in a coherent progression of learning that is clear, organized, and coordinated over time. Teacher guidance includes a unit overview and storyline which outlines how questions and investigations drive student learning as students make discoveries throughout the unit. The overview also describes what the students will figure out, how they will represent what they learned, and how they will engage with all three dimensions in each lesson. There is also a section of background knowledge that provides guidance for adjusting sequence based on students' prior knowledge. These resources support student mastery of the Performance Expectations and maintain coherence. In the Natural Hazards unit, students explore the anchor phenomena and methods for lessening the effects of natural hazards, such as detection, warnings, and minimizing damage. Students then design an initial solution to reduce damage during a natural hazard. Throughout the lessons, students use maps, graphs, physical models, videos, and simulations to identify the causes of tsunamis, how they form and move and what happens as a tsunami makes landfall. Students then work to identify criteria and constraints across different aspects of a hazard response, including

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			structural design solutions to reduce damage, technologies to detect and send warning signals, and communication and education plans that target stakeholders in the communities that will be impacted by a natural hazard. Students use a systematic process to evaluate different design solutions, technologies, and communication options, including assessing the reliability of types of signals for warning residents and protecting communities. In the Chemical Reactions and Energy unit, lessons build students' knowledge about chemical reactions and heat production to develop sea turtle incubators. In Lesson 1, students develop an initial model to discover how the flameless heater in an MRE works. In Lessons 2-3, students determine the heat level of flameless heaters and hand warmers and collect data to support the idea that a chemical reaction causes the devices to heat up. During the rest of the unit, students design, evaluate, and redesign their homemade flameless heaters. In the final lessons, students apply the knowledge gained throughout the unit to design sea turtle incubators. Within the first half of the unit, students gather and record evidence on their model and progress trackers. Then, in the second half of the unit, they use these findings to construct and explain their incubator designs, develop design

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			solutions, and engage in argument from evidence.
	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. Across the majority of the materials, students are not introduced to math skills that go beyond the Grade 8 Louisiana Student Standards for Mathematics (LSSM). Students regularly are called to apply mathematics skills and understanding to engage in Using Mathematics and Computational Thinking (SEP) appropriately in the context of their learning. In the Chemical Reactions and Energy unit, students use a variety of math skills to analyze data and build models. In Lesson 3, students calculate the maximum temperature change for three different amounts of reactants. They report this change in temperature using positive and negative numbers to show the increase or decrease from the starting temperature (LSSM 6.NS.C.5). In Lesson 4, students determine the relative proportion of each reactant that showed the optimal temperature change by calculating the percentage of each reactant (LSSM 6.RP.A.3.C). In Lessons 6 and 9, students increase the amount of reactants to use in their homemade heaters but maintain the same proportion of reactants they found to be most efficient in previous testing (LSSM 6.RP.A.3). In the Natural Resources and Human Impact unit, students engage in mathematical thinking, rate and ratio

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			reasoning, and utilize histograms, line graphs, and scatter plots. In Lesson 7, students practice writing a gas as a fraction using a parts per million measurement, then explain how they would turn the fraction into a percent (LSSM 6.RP.A.1, 6.RP.A.3). In Lessons 9-10, students analyze graphs to determine carbon dioxide levels in the atmosphere. Students annotate the graph in Examining Data Over Time to show human activities that led to changes in the types of energy sources people use over time. In the Genetics unit, Lesson 8, students read Student Support for Probability Work before using mathematical thinking to simplify their predictions about the probabilities of the genotypes for the offspring of two parents. After students read, they use either Punnett squares or probability calculations to make predictions about specific crosses (LSSM 7.SP.C.5, 7.SP.C.6, 7.SP.C.7, and 7.RP.A.25.NF.B.4).
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 (e.g. conversation guides, sample scripts, rubrics, exemplar student responses).	**Yes**	Separate teacher support materials are provided which include extensive teacher guidance with a Unit Overview and Storyline, a Teacher Background section (scientific background about the Disciplinary Core Ideas for the unit), 3-D Strategies sections that detail techniques to further support the development of SEPs, DCIs, and CCCs, and an Assessment System Overview. The Teacher Handbook breaks down the instructional flow for

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			each unit. Each unit in the teacher manual includes a step-by-step lesson outline and provides support, teacher prompts, possible student responses, class discussion guidance, and additional questions. Each lesson includes a detailed learning plan, as well as a section that clarifies where the lesson is going and an overview of the next lesson. The materials also include step-by-step PowerPoints for each lesson. The teacher manual is available in both digital and pdf formats and includes a Unit Overview identifying students' learning objectives throughout the investigation process and the Performance Expectations addressed by the unit. The Unit Storyline includes the Lesson Number and Question, Phenomena, and Major Lesson Points, as well as images that illustrate students' engagement with the phenomena. Teacher Background Knowledge sections include: Lab Safety Requirements, Anchor Phenomenon information, NGSS Dimensions development in context, Unit structure, OpenSciEd Scope and Sequence guidance, student's prior knowledge requirements, and math connections.
	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**	Appropriate suggestions and materials are provided for differentiated instruction supporting varying student needs at the unit and lesson level. Each unit overview includes a pacing guide in which teachers can utilize to plan opportunities for students who need additional experiences

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			and time developing core ideas of the unit. Each unit overview also includes a Phenomenon Relevance Note with suggestions for modifying the anchoring phenomenon to increase accessibility or local and cultural relevance for students, as needed. The Teacher Handbook provides materials' design to promote equitable access to high-quality science learning experiences for all students by focusing on relevance, collaborative sensemaking, and involving all students in the learning process. The materials utilize a universal design for learning principles to meet the needs of all learners and emphasize classroom culture and norms. The materials also provide a Spanish Student Edition and teacher guides for each unit. Teacher guides incorporate support and guidance assistance through the Attending to Equity sidebar callout boxes t and the Supporting Emerging Multilingual Learners and Supporting Universal Design for Learning subheadings. Teachers can find further recommendations for strategies in the Additional Guidance, Alternate Activity, Key Ideas, and discussion callout boxes. For example, in the Tsunami unit, Lesson 2, the Additional Teacher Guidance provides sentence starters which help students express what they see. The Supporting Emerging Multilingual sidebar guides teachers to intentionally group emerging multilingual students with

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			certain peers who know the same languages or with peers whose English language development is slightly more advanced.
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, and other scientific materials are readily accessible through vendor packaging. The information needed for activities is readily available. The teacher portal section of the website allows teachers to view student and teacher books and access student worksheets and slides for each lesson. Units include materials lists and kits for investigations. For the Rock Cycling and Plate Tectonics unit, the lesson set up under the Plan tab lists the required materials per student, group, and class and outlines activity preparation. The Chemical Reactions and Energy unit, Teachers Edition, Lesson 3, includes a materials list for student investigation specific to the student, group, and class, as well as a materials preparation time of 90 minutes.
	Required **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**	Materials help students build an understanding of standard operating procedures in a science laboratory and include safety guidelines, procedures, and equipment. The teacher and student editions provide Science Lab Safety guidance and guidelines for teachers, students, and parents, and the materials' slides incorporate safety procedures in every investigation. For example, the Rock Cycling and Plate Tectonics unit, Unit

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			Overview, Teacher Background information provides lab safety requirements. The Chemical Reactions and Energy unit, Teacher Portal, Quick Launch, Learning Plan Day One, Safety Data Sheet outlines a safety protocol list for students, and specific safety precautions are marked with yellow caution signs in the teacher callout boxes. In Lesson 6, Day 2, students use the How-To Instructions Must-Haves to craft a set of instructions for operating their flameless heaters. Lesson 9, Day 2 incorporates safety precautions for testing the students' prototypes and instructions for safe clean up after the investigation.
	7c) The total amount of content is **viable** for a school year.	**Yes**	The total amount of content is viable for a school year. The materials include six units, with lessons and investigations totaling 31 weeks of instruction. In addition, each unit contains a section in Teacher Background Knowledge that outlines extension opportunities within lessons.
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 embedded into content materials and assess the learning targets. The materials provide teachers with options for assessing student learning progress for each lesson in all units. Each Unit Overview includes an Assessment Overview which outlines the opportunities for different types of assessments throughout the lessons, including pre-assessments, formative assessments, summative assessments, and

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			student self-assessments. Embedded formative assessments are explicitly mentioned in the lesson plans, including student handouts, home learning assignments, progress trackers, exit tickets, and student discussions. Near the end of each unit, students apply the concepts they have learned throughout the unit in a summative assessment. Furthermore, the investigations allow students to complete performance-based tasks. In the Chemical Reactions and Energy unit, Lesson 3, Assessment Opportunity, a formative assessment check focuses on energy transfer between parts of a system. The teacher can utilize lab handouts from the lesson's investigation as a formative assessment. In Lesson 6, an exit ticket builds on students' understanding in Lesson 3, as students map their ideas for a specific design solution to the Energy Transfer Model. In Lesson 10, students demonstrate their understanding on a summative assessment transfer task about sea turtle incubators. The Natural Selection and Ancestry unit, Teacher Overview Materials provides examples of unit assessments. Lesson 11 includes a summative assessment of the students' choice (oral presentation, written response, or pictorial response) in which students use their general models for natural selection to explain a new phenomenon. Similarly, in Lesson 13, students use their general

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			models for natural selection to construct a scientific explanation for modern penguins' connections through a common ancestry.
	Required **8b)** Assessment items and tasks are structured on integration of the **three dimensions** and include opportunities to engage students in applying understanding to new contexts.	**Yes**	Assessment items and tasks are structured on integration of the three dimensions and include opportunities to engage students in applying understanding to new contexts. Each lesson in the units includes at least one Lesson-Level Performance Expectation (LLPE), which are three-dimensionally structured to include the SEP, DCI, and CCC. The Unit Assessments integrate SEPs as students use data, construct explanations, and develop models to address the anchor phenomena. The corresponding SEP, DCI, and CCC are color-coded to indicate alignment to each lesson assessment. In the Genetics unit, Teacher Edition, Lesson 10, students complete a transfer task in which they create a model (SEP, Developing and Using Models) to explain the Cause and Effect (CCC) relationship leading to trait variation from the parents' genotypes to the offsprings' phenotype using goldfish (DCI, MS.LS3A.a). In the Natural Hazards unit, Lesson 4, a formative assessment assess students' ability to construct an explanation (SEP, Constructing Explanations) describing how sudden geologic forces in the ocean floor can cause a tsunami (CCC: Stability and Change; DCI, MS.ESS2C.e), how different communities may be at varying risk of

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			damage, and which communities should be prioritized for tsunami mitigation resources. In Lessons 9-10, the unit summative assessment challenges students to first investigate general regional Patterns (CCC) and risks for other natural hazards by exploring large sets of data (SEP, Analyzing and Interpreting Data), as well as the risks of each natural hazard within their local community (DCI, MS-8-ESS3-2).
	8c) Scoring guidelines and rubrics **align** to performance expectations, and incorporate criteria that are specific, observable, and measurable.	**Yes**	Scoring guidelines and rubrics align to performance expectations, and incorporate criteria that are specific, observable, and measurable. The teacher reference section provides rubrics which include model student answers that demonstrate proficiency for both graded and non-graded assessments, as well as rubrics for teacher and peer feedback. The Natural Hazards unit, Lesson 9 includes answer keys and rubrics for the Unit Assessment in which students develop a tsunami system model. Students evaluate their models using the Engineering Self-Assess, Obtain Information Engineering Self-Assessment, and Peer Feedback Guidelines. In the Genetics unit, Lesson 7, Revise Your Model, teachers can use the answer key and rubric for the formative assessment to determine students' knowledge of an animal's genotype's influence on its musculature phenotype. For Lesson 10, students use the Checklist for Obtaining and Evaluating Information

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			from Scientific Text for a transfer task on goldfish genetics. The lesson also includes answer keys and rubrics for both the checklist and assessment.

FINAL EVALUATION
Tier 1 ratings receive a "Yes" for all Non-negotiable Criteria and a "Yes" for each of the Additional Criteria of Superior Quality.
Tier 2 ratings receive a "Yes" for all Non-negotiable Criteria, but at least one "No" for the Additional Criteria of Superior Quality.
Tier 3 ratings receive a "No" 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-negotiable Criteria of Superior Quality[2]	1. Three-dimensional Learning	**Yes**	The instructional 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 materials integrate the Science and Engineering Practices (SEP), Crosscutting Concepts (CCC), and Disciplinary Core Ideas (DCI) to support deeper learning.
	2. Phenomenon-Based Instruction	**Yes**	Phenomena in the form of common experiences at the beginning of each unit spark students to generate questions and define problems to motivate learning about the core ideas of the unit and establish the purpose for student engagement in the investigations and lessons that follow as students work towards figuring out the phenomena.
	3. Alignment & Accuracy	**Yes**	The materials incorporate the majority (14 out of 19) of the Louisiana Student Standards for Science (LSSS) to the full depth of the standards. The materials do

[2] Must score a "Yes" for all Non-negotiable Criteria to receive a Tier I or Tier II rating.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			not fully address the following standards: 8-MS-PS 1-1, 8-MS-PS1-3, 8-MS-LS 1-4, 8-MS-ESS 3-1, and 8-MS-ESS3-3. All content is accurate, up-to-date, and aligned with the most current and widely accepted explanations. Instructional materials spend minimal time on content outside of the course, grade, or grade-band.
	4. Disciplinary Literacy	**Yes**	Students regularly engage with authentic sources that represent the language and style used and produced by scientists. The instructional materials incorporate a variety of authentic sources, including primary source documents, photographs, and authentic data sets. Students regularly engage in speaking and writing about scientific phenomena and engineering solutions using authentic sources. Materials address the necessity of using scientific evidence to support ideas. There is variability in the tasks that students are required to execute. The 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, but only after students first have the opportunity to build conceptual understanding of the term.
II: Additional Criteria of Superior Quality[3]	5. Learning Progressions	**Yes**	The lessons within and across each unit are organized to support learning through a natural progression. Students engage with and build understanding of the three

[3] Must score a "Yes" for all Additional Criteria of Superior Quality to receive a Tier I rating.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			dimensions of the standards at increasing levels of complexity and sophistication and engage in a coherent progression of learning that is clear, organized, and coordinated over time. Students apply mathematical thinking when applicable. Across the majority of the materials, students are not introduced to math skills that go beyond the Grade 8 Louisiana Student Standards for Mathematics.
	6. Scaffolding and Support	**Yes**	Separate teacher support materials are provided. Appropriate suggestions and materials are provided for differentiated instruction supporting varying student needs at the unit and lesson level.
	7. Usability	**Yes**	Text sets (when applicable), laboratory, and other scientific materials are readily accessible through vendor packaging. Materials help students build an understanding of standard operating procedures in a science laboratory and include safety guidelines, procedures, and equipment. The total amount of content is viable for a school year.
	8. Assessment	**Yes**	Multiple types of formative and summative assessments are embedded into content materials and assess the learning targets. Assessment items and tasks are structured on integration of the three dimensions and include opportunities to engage students in applying understanding to new contexts. Scoring guidelines and rubrics align to performance expectations, and

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			incorporate criteria that are specific, observable, and measurable.
FINAL DECISION FOR THIS MATERIAL: **Tier 1, Exemplifies quality**			

Instructional materials are one of the most important tools educators use in the classroom to enhance student learning. It is critical that they fully align to state standards—what students are expected to learn and be able to do at the end of each grade level or course—and are high quality if they are to provide meaningful instructional support.

The Louisiana Department of Education is committed to ensuring that every student has access to high-quality instructional materials. In Louisiana all districts are able to purchase instructional materials that are best for their local communities since those closest to students are best positioned to decide which instructional materials are appropriate for their district and classrooms. To support local school districts in making their own local, high-quality decisions, the Louisiana Department of Education leads online reviews of instructional materials.

Instructional materials are reviewed by a committee of Louisiana educators. Teacher Leader Advisors (TLAs) are a group of exceptional educators from across Louisiana who play an influential role in raising expectations for students and supporting the success of teachers. Teacher Leader Advisors use their robust knowledge of teaching and learning to review instructional materials.

The 2021-2022 Teacher Leader Advisors are selected from across the state and represent the following parishes and school systems: Acadia, Ascension, Baton Rouge Diocese, Beauregard, Bossier, Calcasieu, Central Community, City of Monroe, Desoto, East Baton Rouge, East Feliciana, Evangeline, Franklin, Iberia, Jefferson, Lafayette, Lafourche, Lincoln, Livingston, Louisiana Tech University, Louisiana Virtual Charter Academy, Orleans, Ouachita, Rapides, Regina Coeli Child Development Center, Richland, Special School District, St. Charles, St. John, St. Landry, St. Martin, St. Mary, St. Tammany, Tangipahoa, Terrebonne, University View Academy, Vermillion, West Baton Rouge, and West Feliciana. This review represents the work of current classroom teachers with experience in grades 6-12.

Appendix I.

Publisher Response

The publisher had no response.

Appendix II.

Public Comments

There were no public comments submitted.