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: **Amplify Education, Inc.** Grade/Course: **Grade 6**

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

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

STRONG	WEAK
1. Three-dimensional Learning (Non-negotiable)	
2. Phenomenon-Based Instruction (Non-negotiable)	
3. Alignment & Accuracy (Non-negotiable)	
4. Disciplinary Literacy (Non-negotiable)	
5. Learning Progressions	
6. Scaffolding and Support	
7. Usability	
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) separately when necessary but they are most often integrated to support deeper learning.	**Yes**	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. For example, in the Matter and Energy in Ecosystems Unit, Chapters 1 and 2, students develop models to describe the cycling of matter and energy among living and nonliving parts of an ecosystem. Students use a virtual Modeling Tool to develop a model (SEP, Developing and Using Models) to describe both photosynthesis and cellular respiration. Within the Modeling Tool, students input a producer, consumer and decomposer to show the transfer of energy (CCC, Energy and Matter) and carbon dioxide through the ecosystem. Students input arrows into the Modeling Tool to show how decomposers recycle materials from dead plants and organisms (DCI, MS.LS2B.c). In the Force and Motion Unit, Chapter 2, Lesson 2.3, students use a simulation to observe how mass, velocity, and force are related. In Activity 1, they make predictions on how equal force

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			should affect an object with different masses. In Activity 3, students model (SEP, Developing and Using Models) their ideas about how an equal force would affect the motion of a pod with more vs. less mass. Students engage with Constructing Explanations (SEP) as well as Scale and Proportion (CCC) to explain how force and velocity changes proportionally on objects of different masses. These activities lead students into carrying out an investigation (SEP, Planning and Carrying out Investigations) in Lesson 2.5 as they use a simulation tool to review key ideas about how variations in mass and force cause changes in velocity (CCC, Cause and Effect). During these activities, students develop the understanding that force, mass and velocity are proportional relationships and that mass of an object affects its velocity from an equal force (DCI, MS.PS3A.a). In the Earth, Moon, and Sun Unit, Chapter 1, Lesson 1.2, students investigate the source of the Moon's light. To begin the lesson, students view a video introducing them to the term "terminator," referring to the border between light and dark on the moon. This information, in conjunction with analyzing photos of light on the moon and exploring the Earth, Moon, and Sun Simulation, helps students determine the best time to take moon photos. By using the Earth, Moon, and Sun Simulation, students explore and create models (SEP,

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			Developing and Using Models) that they use throughout this unit to show how the location of the Earth, Moon, and Sun can influence the way the light reflects off the moon (DCI, MS.ESS1A.a; CCC, Systems and Models). These initial activities lay the foundation for activities for the remainder of the unit. In the Population and Resources Unit, Chapters 2 and 3, students use a Populations and Resources Simulator to track the birth and death rates within a given population. Students engage in Analyzing and Interpreting Data (SEP) as they run through several different application scenarios given within the assignment. Students manipulate the environment within the Population and Resources Simulation to limit resources for a given population or change the number of a particular species to visualize the Cause and Effect (CCC) with a given population (DCI, MS.LS2A.a/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 learning a majority of the time.	**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. This provides purpose and opportunity for students to engage in the investigations and lessons that follow as they work towards making sense of the phenomenon. At the start of each unit, the Anchoring phenomenon is a fictional but realistic scenario that students will investigate in the role of a scientist. The

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			students are tasked with finding a solution or explaining a problem as presented in the unit opener. Accomplishing the proposed task drives instruction by providing the purpose and opportunity for learning in the unit. Each subsequent chapter in the unit has an investigative phenomenon for students to explore. There is a unit question and a question for each chapter which coincides with the Anchor and Investigative phenomena; however, students also develop their own thought-provoking questions throughout the units and refine what they know as they gain more knowledge. Each lesson is connected to the one before as students incrementally gain knowledge about the anchor phenomenon through key concepts developed throughout the lessons. In the Magnetic Fields unit, students are introduced to a magnetic spacecraft launcher and are tasked with investigating why the model spacecraft exceeded the target speed in the third test run of a magnetic spacecraft launcher test. This requires students to make sense of science concepts to explain not only how a magnetic spacecraft launcher could work but also to explain the unexpected test results. In Chapter 1, students first investigate magnets to determine how the launcher can make the model spacecraft move without touching it. This leads to investigating the origin of the energy to launch the model spacecraft in Chapter 2

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			where students develop the understanding that moving a magnet against a magnetic force transfers energy to the magnetic field. In Chapter 3, students develop the concept that the strength of the magnetic forces affects the amount of potential energy that can be stored in the magnetic field. By the end of the chapter, students use these concepts learned during the unit to develop an explanation for the unexpected results in the third test. Finally, in Chapter 4, students apply what they have learned as they evaluate different designs used to launch an electromagnetic roller coaster. In the Microbiome Unit, students act as researchers looking at a case study about fecal transplants. They have to figure out how this fecal transplant helped aid in a patient's recovery. They then have to argue about whether this novel treatment warrants the use of public funds. In Chapter 2, Lesson 2.7, students come up with their scientific argument to be used for a “press release” for the Microbiome Research Institute. Over the course of the chapter, the students gain knowledge and apply what they have learned to complete the task set forth in the phenomenon. In the Force and Motion Unit, Chapter 1, Lesson 1.2, students watch an introduction video, “The Missing Seconds,” that sparks their interest and introduces them to the anchoring phenomenon within the fictional Universal

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			Space Agency mission. The video shows an asteroid sampling-collecting pod returning from a collecting mission. As it approaches, the video feed cuts out, and when it comes back online, the pod is no longer approaching the space station but floating away. The space agency gives the students a mission to solve why an asteroid sampling-collecting pod, after the video feed cut out, is no longer seen approaching the space station. As students develop scientific concepts about force, motion, mass, and collisions in the following chapters, they are referred back to the anchoring phenomenon/mission throughout the unit. By the end of Chapter 3, students use evidence to explain what happened to the pod and then apply what they have learned to explain a newly presented phenomenon in Chapter 4.
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, 68% (13 out of 19), of the Louisiana Student Standards for Science (LSSS) are incorporated to the full depth of the standards. LSSS 6-MS-PS2-4 is only partially addressed within both the Magnetic Field Unit and the Force and Motion Engineering Internship. In the Magnetic Field Unit, students read the article “Escaping a Black Hole” and answer two questions regarding gravitational force. In the Motion Engineering Internship, the materials provide an optional reading, “The Physics of Falling,” to help explain gravity. Students do not

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			fully engage with the standard as the materials do not incorporate any SEPs or CCCs when addressing the standard. LSSS 6-MS-PS4-2 is only partially addressed as the materials do not fully address all of the DCIs embedded within the standard. In the Light Waves Unit, DCI MS.PS4A.b is only addressed at the end of Chapter 2, Lesson 2.3 in a homework assignment. Students do not fully engage with the DCI as they read an article and then answer three questions regarding sound waves. LSSS 6-MS-ESS1-2 and 6-MS-ESS1-3 are only partially covered. The main focus of the Earth, Moon, and Sun Unit is to describe the interaction between the three planetary objects and how their interaction can create the phases of the moon and eclipses. In Chapter 4, students are tasked to investigate the possibility for a lunar eclipse in a possible solar system with two suns, but students do not discuss the importance of the sun and its gravitational pull that causes the earth and other objects to orbit around it (DCI MS.ESS1B.a). No evidence was found within the unit that discussed other planetary structures located within our solar system and their interactions within our galaxy (DCI, MS.ESS1B.c). LSSS 6-MS-LS1-1 is addressed in the FlexExtension Microbiome Unit Assignment. The Teacher Guide and instructions states that the FlexExtensions are optional. A teacher must select a separate document to view

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			the FlexExtensions. LSSS 6-MS-LS1-2 is only partially addressed in the materials. In the Microbiome Unit, Chapter 1, Lesson 1.2, Homework, students read an article, "Cells," and answer three questions about cells. Students do not fully engage in any SEPs or CCCs during the activity. In Matter and Energy in Ecosystems, students are introduced to the organelles, chloroplast and mitochondria, and learn about their functions. These are the only organelles that students are introduced to within the unit (DCI MS.LS1A.b).
	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.
	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. At times, some of the lessons go further in depth than what is expected of Grade 6 students. This occurs most often in the lesson extensions and does not take away from addressing on grade level content. For example, in the Population and Ecosystem Unit, LSSS 7-MS-LS2-4 and 7-MS-LS2-5 are slightly addressed but are more of an extension of the learning of 6-MS-LS2-1, 6-MS-LS2-2, and 6-MS-LS2-3 instead of a distraction.

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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. Additionally, the Unit Launcher for each unit includes an excerpt from a scientific article or a real life situation for students to analyze and discuss within the context of their studies. For example, in the Forces and Motion Unit, students become acquainted with the tasks they will be completing as they assist physicists working to determine what happened to an asteroid sample-collecting pod that went off course. To prepare for the investigation, students share their initial thoughts on two claims of what may have happened to the pod based upon prior knowledge. Then, they conduct a hands-on investigation about changing an object's motion, both from a stationary starting position and as an already-moving object, using a simulation and hands-on activities. Students identify the five ways that the motion of an object can change and discover that forces cause changes in motion. Vocabulary is introduced as needed and reinforced by use throughout the unit. At the end of the unit, students participate in a science seminar. Students engage in a scientific argument and use the evidence they gathered throughout

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			the unit to refute or support the initial claims. Students also brainstorm to find other ways in which the principles they have discovered can be applied. In the Microbiome Unit, Chapter 2, Lesson 2.1, students read "The Human Microbiome: A World Inside You." In the article, students learn about helpful and harmful microorganisms that live on and in the human body. Students annotate the article and think of questions and comments as they read. Students discuss the annotations through a share, discuss, and present model. Students use the information from the article in the lessons that follow as they work toward the unit task of helping the Microbiome Research Institute figure out how the tiny organisms in one person's microbiome can fight harmful bacteria in someone else's body. In the Matter and Energy in Ecosystems Unit, students watch an introduction video, "Living in a Biosphere," that shows how Biosphere 2, a self-contained ecosystem, was closed in 1992 to test whether an ecosystem could survive under glass for possible outer planetary communities. The video provides the opportunity for students to revisit history and see how far technology has advanced and where it could go next. Throughout the unit, students refer back to Biosphere 2 to discover solutions for recreating a better Biosphere. In the Light Waves Unit, students investigate why the skin cancer

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			rate in Australia is so high. Through a short documentary video, students meet a real spectroscopist and find out what her job involves. To learn how light from the sun can cause skin cancer, they gather evidence about why light can cause materials to change. Students obtain evidence about how light interacts with materials through hands-on investigations and electronic simulation activities. Students use maps, charts, short videos and articles to evaluate evidence about the amount of sunlight in Australia compared to other places in the world. For example, in Lesson 2.5, students use a World Sunlight Map that displays total hours of bright sunlight per year on average, two bar graphs that show the estimated percentage of populations with each melanin level in Brazil and Australia, and a World Ultraviolet (UV) Light Map that shows the amount of ultraviolet light in joules per square meter. Students use this authentic data to evaluate claims about Australia's high skin cancer rate. During the activity, students make sense of the evidence, discuss and record their thinking in their Investigative Notebooks, and use key concepts and evidence to help explain why the skin cancer rate is higher in Australia than in Brazil. The purpose of this chapter is for students to understand that light from the sun carries energy and that when a material absorbs energy from light, the energy causes the material to

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			change. At the end of the unit, students participate as a whole class in the Science Seminar. Here students make sense of evidence, synthesize content and debate which claims are best supported.
	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. All units include an activity of speaking and writing about scientific phenomena. Students use evidence based upon authentic data, models (either provided by the teacher or generated by the student), hands-on or simulation lab activities, and scientific articles to engage in scientific argumentation and debate in order to write their final claim. Within four different units, Population and Resources Unit, Matter and Energy in Ecosystems Unit, Earth, Moon, and Sun Unit, and Light Waves Unit, students engage in Science Seminars which allow students to speak and engage in scientific arguments supported by evidence they collected for the subject. In the Earth, Moon, and Sun Unit, Chapter 4 Science Seminar, students assert whether or not it is possible for a lunar eclipse to occur on a planet called Kepler-47c in a galaxy with two suns. In Lesson 4.1 and 4.2, students review scientific ideas they developed about when lunar eclipses occur on Earth in the

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			revolutions around the sun. In Lesson 4.3, students apply that knowledge to understanding to the planet Kepler-47c. In almost every unit, students engage in writing a cause and effect summary to explain the anchoring phenomenon. For example, within the Matter and Energy in Ecosystems Unit, Chapter 3, Lesson 3.4, students write a summary that includes evidence they collected throughout the first two chapters to help scientists for Biosphere 2 better understand why plants and animals were not getting enough energy storage molecules to survive.
	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 are regularly engaged in a variety of tasks, such as creating models, solving problems, explaining phenomena, and drawing conclusions from investigations. For example, in the Microbiome Unit, students begin by viewing a video that introduces the problem to solve for the unit followed by a "gross" microscopy slideshow. They work in pairs to sort cards of microorganisms and molecules according to relative size. There is an Investigation Notebook in which they document evidence and answer analyzing questions. They view a student-generated video about cells and discuss what they have seen, then add

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			entries in their notebooks including a drawing of a cell. They add a few more cards to their card sort to include cells. An article, "The Human Biome," is the basis for the reading and responding activity in which students discuss and annotate the article. After viewing another short video, students are introduced to a case study on fecal transplant research for further exploration of the interactions of microorganisms and the human body. After more notebook entries, students read about a scientist who works with antibiotics and the human body. This prepares the students to begin evaluating evidence cards, discussing claims, and preparing for a science seminar. They analyze scientific data from experiments and prepare to address the problem that was introduced at the start of the unit using the Reasoning Tool to help write their final arguments. Here, students engage in scientific argumentation to refute or support the claims. In the Force and Motion Engineering Internship Unit, students are tasked with finding a solution to dropping supplies to disaster areas that cannot be accessed through the roads. In Days 2 and 3, students investigate designs by creating a system to drop eggs without breaking them. In Days 4 and 5, students analyze designs that already exist for dropping supplies to disaster areas. In Days 6 through 10, students choose the

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			optimal design and write a proposal plan for their design.
	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. Each unit has a multi-language glossary of vocabulary terms associated with the concepts. Printable copies are available. Vocabulary terms are introduced as needed and referred back to throughout the unit to reinforce understanding and usage of the terms. In the Population and Resources Unit, students are introduced to vocabulary as words are used within the unit. For example, in Chapter 1, Lesson 1.2, Teacher Led Discussion, students are introduced to the terms “ecosystem” and “population” after they have seen the words and heard them multiple times. Students use context clues to discover what they think the words mean and are guided to look the words up in the glossary provided for them digitally. In the Force and Motion Unit, Chapter 1, Lesson 1.3, students are introduced to the terms “force” and “exert” after concepts are developed. Students first explore the Force and Motion Simulation and then discuss what they observed with a partner. Students are then placed in large

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			groups to complete a jigsaw activity. Finally, students are introduced to the terms and key concept about velocity for the lesson.
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. This supports student mastery of the Performance Expectations and prevents misunderstanding. For example, in the Light Waves Unit, the "Progress Build" section of planning includes an explanation of progression throughout the unit. It shows progress from prior knowledge and misconceptions to three levels of knowledge the students are expected to gain by the end of the unit. This is where the key concepts are shown to build and connect. For example, in the Populations and Resources Unit, students learn in a natural progression throughout the chapters until they apply their knowledge to a new topic in the final chapter. In Chapter 1, Stability and Change in Populations, students investigate a simulation model that they use throughout the unit to investigate the

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			different things that can affect the growth and reproduction of a population. Students use the simulation to demonstrate how a population can be considered stable. In Chapter 2, Energy and Changes to Populations, students use the simulation to investigate how the energy within the population can be passed from organism to organism within a food chain or web. Students also apply their knowledge to the anchoring phenomenon, moon jellies. In Chapter 3, Indirect Effects in Ecosystems, students learn about how different things such as resources or a decrease in a competing organism can indirectly affect a population growth. Students use the simulation and research given to develop an explanation as to why the anchoring phenomenon, explosion in moon jellies, occurred. Finally, in Chapter 4, Science Seminar, students apply their knowledge of population and resources to a new topic, the decrease in orange-bellied parrot populations. Students also build knowledge about how to communicate in a science setting allowing them to effectively meet multiple PEs in the year. In the Microbiome Unit, students learn about scientific argumentation as part of the units, not as a separate entity. They later build on this knowledge with units like the Sun, Earth, and Moon Unit, which ends with a science seminar in Chapter 4.

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	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 Louisiana Student Standards for Mathematics (LSSM) for Grade 6. 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. For example, in the Microbiome Unit, students use math skills to represent real world size through a scale tool simulation to view microscopic cells and even go as small as an electron. Students investigate the concept of scale in Chapter 1: Microorganisms On and In the Human Body lesson. Students use the actual metric system measurements to understand how small microorganisms can be; however, students do not have to perform operations with numbers expressed in scientific notation which is an 8th grade skill (8.EE.A.4). In the Magnetic Field Unit, Chapter 2, Lesson 2.3, students create charts of the relationship between magnetic force and potential energy in a grade level appropriate way. The comparison chart format makes it easy for 6th graders to grasp the concept that they are connected. In the Light Waves Unit, students use ratio reasoning and proportional relationships (LSSM 6.RP.A.2, 6.RP.A.3) to illustrate and explain the

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			relationship between wavelength and intensity and speed.
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**	There are separate teacher support materials provided. Support materials include, within each unit, Planning for the Unit and Teacher References. Planning for the Unit has several tabs that include: Unit Overview (describes what is included in the unit, why students are learning about the unit, and how the teacher will instruct the students), Unit Map (shows the teacher what the students will figure out and how they figure it out for each chapter), Progression Build (describes the way students' explanatory understanding grows throughout the unit), Getting Ready to Teach (gives step-by-step instructions of how to prepare for the unit), Materials and Preparation (lists materials needed for the entire unit along with kits to purchase if that route is needed), Science Background (provides teacher background knowledge, possible misconceptions or preconception knowledge from students, and pedagogical considerations), and Standards at a Glance (list of Performance Expectations (PE), Science and Engineering Practices (SEPs), Disciplinary Core Ideas (DCIs), Crosscutting Concepts (CCCs), and English Language Arts and Mathematics standards). Teacher References has several tabs that include: Lesson Overview Compilation (briefly describes each chapter and lesson's overall questions),

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			Standards and Goals (instead of a simple list of the standards addressed, standards are written out in full length and even noted in which other Units they are covered), 3-D Statements (breaks down each chapter and lesson through color coding the overview with three dimensional aspect), Assessment System (provides a table to explain the assessment type, where it is located within the unit, and DCIs covered), Embedded Formative Assessments (explains the location of formative assessments that help a teacher monitor and support student progression), Articles in This Unit (briefly describes the article, when students are introduced to the articles and explains what students learn from the article), Apps in This Unit (notifies teacher of any needed applications students will use throughout the unit), and FlexExtensions in This Unit (if included in the unit, teachers are informed about the information the FlexExtension contains and where it is located within the unit). Support materials within each lesson include: Digital Resources (lists all needed resources for that particular lesson), Overview (describes step by step for the lesson, includes time for each step, and what students will learn), Materials & Preparation (what should be on classroom walls, materials for each class, individual students, and digital tools, and even gives

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			teachers a Preparation list of things to do before, during, and after class), Differentiation (breaks down support and potential challenges for both Diverse Learners and Students Who Need More Support), Standards (has a color coded 3-D Statement along with where SEPs, DCIs, and CCCs are covered within the lesson), Vocabulary (lists vocabulary words introduced in the lesson), and Unplugged? (lets the teacher know if any items are available offline for students with limited internet access).
	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. In each lesson, under the Differentiation section on the Lesson Brief Tab, teachers are given support and potential challenges that might arise for both English Learners and students who may need more support. Each unit overview also includes a Phenomenon Relevance Note that includes alternatives, as well as suggestions for modifying the anchoring phenomenon to make it more accessible and/or locally and culturally relevant for students if needed. For each of the reading articles associated with the lessons of the units, a reader option is available. There is an annotation option for the articles and a vocabulary identification option in an alternate language in each article. In Populations and Resources Unit, Chapter 1, Lesson 1.2,

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			teacher guidance identifies a potential challenge of the lesson, the interpretation of visuals. It goes on further to explain that while students are using the simulation, they might struggle with working the different aspects within it so extra support might be required while conducting the simulations. For the English Learners within this same unit and lesson, the differentiation discusses ways to support these learners through planning ahead of time and encouraging them to express in their own language as needed. In the Magnetic Fields Unit, Chapter 2, Lesson 2.1, teacher guidance identifies the potential challenge of the lesson, reading focus, and recommends that students should read in pairs to help break up the duties of reading strenuous text. For Students Who Need More Support, the teacher is instructed to create a positive environment by setting goals that all students follow. The guidance suggests that while students read, they record at least one question about the text and then complete one summary. In the Matter and Energy in Ecosystems Unit, Chapter 1, Lesson 1.3, guidance for specific differentiation strategies for English Learners is provided and includes the suggestion for extended teacher modeling with pairs or small groups. Specifically, the guidance suggests that before students read Sunlight and Life, the teacher should choose a section

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			from the article to read aloud with a small group of English Learners and model what to do when they do not understand some part of the text. The guidance also suggests that the teacher model how to notice a break in understanding, reread sections, and then identify an idea, confusing word, or phrase that they understand more clearly. Additionally, every lesson includes the digital glossary in the Digital Resources with definitions in Spanish for primary Spanish speakers.
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. A full teacher's guide is available online and for download and print. Each unit contains an Investigation Notebook which contains the materials needed for the entire unit. The Investigation Notebook is available either digitally or through a package kit by the vendor. Each unit incorporates scientific articles digitally through the Article Complication. Students have access to student apps and text through digital platforms. Prepared kits can be ordered for each unit through the vendor. In the Earth, Moon, and Sun Unit, Materials and Preparation section, a chart includes all the items provided in the Earth, Moon, and Sun Kit that are needed to present the entire unit five times for a class of 40 students. Some printed materials are included with the kit such as Moon Phases Paper Model Templates and Classroom

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			Wall Materials. An additional table is provided that lists all of the consumable materials that might need to be purchased outside of the vendor for all classes to use. All needed materials for each unit and lesson are located under the Materials and Preparation Section. For example, in the Magnetic Fields Unit, Chapter 1, Lesson 1.2, under the Materials & Preparation Section, guidance is provided for what should be posted on the classroom walls for students to see. These materials are available for print, such as Vocabulary cards, Chapter Questions, and Key Concepts. This section also includes a list of what each class should have a set of, what each pair of students should have a set of, what each individual student should have a set of, and the digital tools students will be using within the lesson. All teacher provided items are denoted with an asterisk.
	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 Guidelines for Science Investigation are provided for every student within their Investigation Notebook. This includes guidelines such as following instructions, protecting eyes and hands, and telling the teacher if they have allergies. Additional safety guidelines, procedures, and equipment are added, as needed, depending on the investigation.

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			For example, the Force and Motion Engineering Internship Unit, Chapter 1, Lesson 1.2 includes a yellow safety note at the top of the Teacher: Egg Drop Challenge instructions. The safety note instructs students and teachers on the risk of handling raw eggs, clearing a space for dropping eggs free of students' paths, and following all school district guidelines on disposal of egg waste. These additional safety notes are located in the digital online interactive lesson.
	7c) The total amount of content is **viable** for a school year.	**Yes**	The total amount of content is viable for a school year. There are 125 instructional days of content with no added FlexExtensions or Louisiana Companion Lessons. Eighteen more days can be added with the accompaniment of the Louisiana Companion Lessons and FlexExtension Lessons bringing the total instructional days to 143. Each lesson within the unit is broken down into 45 minute lessons. For example, in the Light Waves Unit, Chapter 1, Lesson 1.2, a timed schedule is provided under the Overview Lesson at a Glance. Minutes are provided for each activity including the Warm-Up (5 minutes), “Interview with a Spectroscopist” (10 minutes), Activity 2 “Skin Cancer in Australia” (10 minutes), and Activity 3 “Evidence of Energy from Light” (20 minutes), totaling 45 minutes. The Louisiana Companion Lessons also include a time frame for each lesson. For example, the Louisiana Companion lesson for

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			Populations and Resources Unit, Lesson 1: Protecting Our Natural Resources, provides a recommended placement for the lesson. Although the lesson is not broken down into time allotments for each activity, the suggestion time frame of 55 minutes to complete this lesson is provided.
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. All of the assessments for the unit are located in the Teacher References section under the sub header Assessment System and Embedded Formative Assessments section of the unit home page. Under these tabs, descriptions, explanations, and tables with locations for assessments are provided. Formative assessments, such as Pre-Unit Assessments, On-the-Fly Assessments, Self-Assessments, Investigation Assessments, and Critical Juncture Assessments are listed and described in this section. End-of-Chapter Modeling and Arguments and Rubrics are provided as needed for each unit. It is suggested that some of these formative assessments (Pre-Unit Assessments, On-the-Fly Assessments, and Self-Assessments) should not be graded, but used for data on student progression. Summative assessments, such as End-of-Unit Assessments, End-of-Unit Performance, and Investigative Assessments, are also

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			listed within the Assessment System section. The End-of-Unit Assessments include multiple choice questions with written responses and are similar to the Pre-Unit Assessments students take at the beginning of every unit. In some units, an additional End-of-Unit Performance: Science Seminars can be found for summative assessments. For example, in the Matter and Energy in Ecosystems Unit, under the Assessment System, the assessment table lists which assessments the students will take during the activities. In Chapter 1, Lesson 1.1, Activities 1-3, the students complete a Pre-Unit Assessment consisting of multiple-choice and written-response questions. In Chapter 1, Lesson 1.6, Activity 4, students complete two different assessments: On-the-Fly Assessment and an End-of-Chapter Modeling titled 3-D Performance Task: Model for the Econauts. In the Populations and Resources Unit, Chapter 4, students engage in a multicomponent performance task that requires students to use several SEPs (Analyzing and Interpreting Data, Constructing Explanations, Engaging in Argument from Evidence, and Obtaining, Evaluating, and Communicating Information) to construct a written scientific argument. A rubric for the students' responses is provided. However, the summative assessments do not give a very wide range of questions that students might see on an end of the year state test.

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	Required **8b) Assessment** items and tasks are structured on integration of the **three-dimensions**.	**Yes**	Assessment items and tasks are structured on integration of the three dimensions. Under the Assessment System tab of the Teacher Reference section in the unit home page, a table is provided that breaks down the three dimensions within each formative and summative assessment. The only unit that does not include this table is the Microbiome Unit; however, formative assessments are embedded in the chapter that integrate the three dimensions. For example, in the Microbiome Unit, a formative assessment opportunity is evidenced in the articles with checkpoint questions and annotations highlighting the CCC Scale, Proportion, Quantity and the DCI Structure and Function. In the application phase after the readings, students engage in scientific argument where the SEPs Analyzing and Interpreting Data, Engaging in Argument from Evidence and Obtaining, Evaluating and Communicating Information are integrated. The summative End-of-Unit written response assesses the CCC Scale, Proportion, Quantity; the DCI Structure and Function; and the SEP Constructing Explanations and Designing Solutions. In the Force and Motion Unit, Chapter 2, Lesson 2.1, Activity 2, students complete a 3D Performance Task: Planning and Conducting an Investigation, which is labeled as an Investigation Assessment. The task incorporates the DCIs MS.PS2A.b and MS.PS2A.c, the SEPs Planning and

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			Carrying Out Investigations, Analyzing and Interpreting Data, and Using Mathematics and Computational Thinking, and the CCC Cause and Effect. Part 1 includes the question, "If the same strength force is exerted on two objects, why might they be affected differently?" Students then answer various questions with written responses to the following questions: "Think about what you already know. Why might two objects be affected differently if the same strength force is exerted on them? Plan an investigation to test your ideas. What will you change (the independent variable) in each test? What will you observe (the dependent variable) as a result of that change? What tools do you need to measure results? What will you keep the same (control) in every test? How many tests should you conduct for each object? Why?" In Part 2, students engage in the investigation and create a data table to record the results. Students then answer the following questions: "Analyze your data. What do you notice? Why might two objects be affected differently if the same strength force is exerted on them?" The assessment includes a rubric for DCIs, CCCs, and SEPs that are being addressed within this assessment. Possible student responses are provided for teachers to compare student response to track their progression of learning.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
	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. In each unit, rubrics, possible student responses, and look-fors are provided for teachers to correctly analyze student responses and models. For example, in the Earth, Moon, and Sun Unit, Chapter 2, Lesson 2.7, Reflection Questions, students complete a formative self-assessment about the key concepts they have learned up to this point in the unit and reflect on additional questions they might have about the Earth, Moon, and Sun system. Assessment guidance for how to use a self-assessment is provided and is located in the Teacher Support tab of the activity which states to use this assessment for "insight into student thinking thus far in the unit." In the Light Waves Unit, the End-of-Unit Assessment rubric has a Progress Build to identify the rate of growth. It includes a science content evaluation chart in order to determine increased understanding from the beginning of the unit to the end as aligned to the standards. The questions in the assessment and the rubric used to evaluate them are reflective of the Unit Performance Expectations. In the Light Waves Unit, Chapter 4, Lesson 4.4, End-of-Unit Assessment, students respond to the following prompt: "Tyrel is learning about a certain kind of metal used to make satellites. He learns that infrared light is

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			absorbed by the metal, X-ray light is transmitted through the metal, and visible light is reflected off the metal. Tyrel wonders if the metal will get warm if he shines the light on it. Can light cause the metal to get warm? Why or why not? Does it matter what type of light shines on the metal?" A scoring guide is provided outlining several ways to assess student understanding. One part of the scoring guide includes a Science Content Rubric that shows possible student responses at each level of the Progress Build. The levels include: "Level 1: The student indicates that light carries energy that can cause materials to change; Level 2: The student demonstrates an understanding of Level 1 and explains that materials can only absorb energy from some types of light and not others; and Level 3: The student demonstrates an understanding of Levels 1 and 2 and explains that materials can only take in energy from types of light that are absorbed; types of light that are reflected or transmitted do not change a material." The scoring guide also includes a Crosscutting Concept Rubric that assesses student understanding of the CCC Energy and Matter. A score of 0 is assigned to students that do "not show understanding that the movement of energy can be tracked by observing the changes that energy causes to matter." A score of 1 is assigned to a student that "describes transfer of energy into a

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			material (e.g., energy from light being absorbed by the metal)" OR "describes energy causing a change to a material (e.g., energy causes the metal to get warm)." A score of 2 is assigned to a student that "describes transfer of energy into a material (e.g., energy from light being absorbed by the metal) AND "describes energy causing a change to a material (e.g., energy causes the metal to get warm)."
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 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 provides purpose for students to engage in the investigations and lessons that follow as they work towards figuring out the phenomenon.

[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
	3. Alignment & Accuracy	**Yes**	The majority 68% (13 out of 19) of the Louisiana Student Standards for Science (LSSS) 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. No evidence of incorrect or out of date science explanations could be found. Instructional materials spend minimal time on content outside of the 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. 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. Within each module, students are asked to produce and revise models of the anchoring phenomenon. Across the materials, students are regularly engaged in a variety of tasks, such as creating models, solving problems, explaining phenomena, and drawing conclusions from investigations. 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

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			understanding of the term. Each unit has a multi-language glossary of vocabulary terms associated with the concepts. Students are encouraged to refer back to it as needed. Printable copies are available.
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. This supports student mastery of the Performance Expectations and prevents misunderstanding. Students apply mathematical thinking when applicable. Across the majority of the materials, students are not introduced to math skills that go beyond the Louisiana Student Standards for Mathematics for Grade 6. 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.
	6. Scaffolding and Support	**Yes**	There are separate teacher support materials provided. Appropriate suggestions and materials are provided for differentiated instruction, supporting

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

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			varying student needs at the unit and lesson level.
	7. Usability	**Yes**	Text sets, 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. Scoring guidelines and rubrics align to performance expectations and incorporate criteria that are specific, observable, and measurable. In each unit, rubrics, possible student response, and what to look-fors are provided for teachers to correctly analyze student responses and models.
FINAL DECISION FOR THIS MATERIAL: **Tier I, 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 2020-2021 Teacher Leader Advisors are selected from across the state and represent the following parishes and school systems: Acadia, Ascension, Beauregard, Bossier, Caddo, Calcasieu, City of Monroe, Claiborne, Diocese of Alexandria, East Baton Rouge, Evangeline, Firstline Schools, Iberia, Iberville, Jefferson, Jefferson Davis, Jefferson Parish Charter, KIPP, Lafayette, Lafourche, Lincoln, Livingston, Louisiana Tech University, Louisiana Virtual Charter Academy, Lusher Charter School, Natchitoches, Orleans, Ouachita, Plaquemines, Pointe Coupee, Rapides, Richland, Special School District, St. Charles, St. Landry, St. Tammany, Tangipahoa, Tensas, Vermillion, Vernon, West Feliciana, and Zachary Community. This review represents the work of current classroom teachers with experience in grades 3-12.

Appendix I.

Publisher Response

The publisher had no response.

Appendix II.

Public Comments

There were no public comments submitted.