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: **CPO Foundations of Physical Science 3rd edition, and CPO Foundations of Physics, 2nd edition**

Publisher: **Delta Education, LLC** Grade/Course: **Physical Science, Physics** Copyright: **2018, 2016**

Overall Rating: **Tier III, Not representing quality**

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

STRONG	WEAK
	1. Alignment Accuracy (Non-Negotiable)
	2. Three-dimensional Learning (Non-Negotiable)
	3. Disciplinary Literacy (Non-Negotiable)
	4. Learning Progressions (Non-Negotiable)

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 received a "Yes" for all Criteria 1-7.
Tier 2 ratings received a "Yes" for all non-negotiable criteria, but at least one "No" for the remaining criteria.
Tier 3 ratings received a "No" for at least one of the non-negotiable criteria.

Click below for complete grade-level reviews:

Physical Science (Tier 3) Physics (Tier 3)

Strong science instruction requires that students:

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- Investigate, evaluate, and reason scientifically, and
- Connect ideas across disciplines.

Title: **CPO Foundations of Physical Science, 3rd edition** Grade/Course: **Physical Science**

Publisher: **Delta Education, LLC** Copyright: **2018**

Overall Rating: **Tier III, Not representing quality**

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

STRONG	WEAK
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	3. Disciplinary Literacy (Non-Negotiable)
	4. Learning Progressions (Non-Negotiable)

To evaluate each set of submitted materials for alignment with the standards, begin by reviewing the indicators listed in Column 2 for the non-negotiable criteria. If there is a "Yes" for all required indicators in Column 2, then the materials receive a "Yes" in Column 1. If there is a "No" for any required indicator in Column 2, then the materials receive a "No" in Column 1.

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

Tier 1 ratings receive a "Yes" in Column 1 for Criteria 1 – 7.
Tier 2 ratings receive a "Yes" in Column 1 for all non-negotiable criteria, but at least one "No" in Column 1 for the remaining criteria.
Tier 3 ratings receive a "No" in Column 1 for at least one of the non-negotiable criteria.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
SECTION I: NON-NEGOTIABLE CRITERIA: Submissions must meet all of the non-negotiable criteria in order for the review to continue.			
Non-Negotiable **1. ALIGNMENT & ACCURACY:** Materials adequately address the Louisiana Student Standards for Science. Explaining phenomenon and designing solutions drive student learning. ☐ Yes ☒ No	**REQUIRED** **1a)** The majority of the Louisiana Student Standards for Science are incorporated, to the full **depth of the standards**.	**No**	Less than 10% of the Louisiana Student Standards for Physical Science are fully covered by the instructional materials. Instructional materials generally include partial alignment or full alignment to the disciplinary core ideas (DCIs) but rarely include the science and engineering practices (SEPs) and crosscutting concepts (CCCs). Unit 4, Chapter 11 addresses HS-PS3-4, but only the following disciplinary core ideas: HS.PS3B.b, HS.PS3B.e, HS.PS3B.a. The standard calls for students to plan and conduct an investigation and provide evidence to support the Second Law of Thermodynamics. Investigation 11A attempts to address this practice, but provides all of the necessary steps students should take for the investigation. It does not allow students to plan the investigation, which is called for by the SEP. The CCC, Systems and System Models, is not adequately addressed in the activities, student reading text, or teacher guide (pages 238-242). Although the Instructional Multimedia Content Video, Heat and Temperature, explains the differences between heat, temperature, and energy, it does not fully address crosscutting concept. Partial attainment of the standard HS-PS4-1 was achieved. Unit 8, Chapter 23 (pages 564-567) and Chapter 2 (page 588) includes the SEP Mathematics and Computational Thinking in regards to frequency and wavelength. Investigations 23B (pages 131-134), 24A (pages 135-138), and 24B (pages 139-142) also address the standard. Throughout the investigations, students analyze the differences in frequency between multiple sounds and use a sound generator and Data Collector to estimate the frequency of a glass and bottle that is filled with different heights of water. However, the full extent

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			of the performance expectation is not met; the mathematics does not apply to how the waves change when passing through various media. Unit 8, Chapter 25 also covers optics but does not apply the mathematics to explain how lenses change the properties of waves. Cause and Effect, the CCC, is not explicitly addressed.
	REQUIRED **1b)** Observing and **explaining phenomenon** and **designing solutions** provide the purpose and opportunity for students to engage in learning.	**No**	Observing and explaining phenomena do not provide the purpose for learning. The instructional materials rarely use phenomena to drive student learning. Unit 5, Chapter 14 (page 313) introduces students to bioluminescent creatures. However, students do not deeply develop an understanding of the phenomenon or make sense of how and why the phenomenon takes place. Bioluminescence is mentioned on pages 328-330. The questions at the end of the reading section such as, "Which energy source provides energy for bioluminescent animals?" do not set the purpose for learning. Each chapter in the student edition begins with a story. However, the stories are not used as an anchoring phenomenon and students do not explore or complete lesson investigations connected to the stories. The stories have questions that are proposed to the students, but the students are not engaged in investigating these throughout the sequence of learning.
	REQUIRED **1c)** Science content is **accurate**, reflecting the most current and widely accepted explanations.	**Yes**	The science content is accurate and represents the most up-to-date knowledge. For example, the Periodic Table on page 336 includes the most recently discovered elements.
	1d) In any one grade or course, instructional materials spend minimal time on content outside of the course, grade, or grade-band.	**No**	The majority of the instructional materials include content that is outside of the grade level for high school Physical Science. Much of the content in Unit 2 addresses the middle school standards in the MS-PS2 cluster. Chapter 18, Section 1 (pages 410-413) includes endothermic and

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			exothermic reactions, which is content that is also aligned to the middle school standards. Unit 3 includes mathematical concepts related to the course; however, the instructional materials focus on basic computational skills and lack the rigor that is needed to reach the end of year performance expectations. Specifically, in Unit 3, Chapter 8 (page 192), the section review asks students to apply mathematical skills that require basic recall of the formulas presented. Units 7 and 8 include the following standards, which are beyond the expectations of the Louisiana Student Standards for Physical Science: HS-PS4-2, HS-PS 4-3, and HS-PS 4-5.
Non-Negotiable **2. THREE-DIMENSIONAL LEARNING:** Students have multiple opportunities throughout each unit to develop an understanding and demonstrate application of the three dimensions. ☐ Yes ☒ No	**REQUIRED** **2a)** Materials teach the science and engineering practices, crosscutting concepts and disciplinary core ideas separately when necessary but they are most often integrated to support deeper learning. Assessment items and tasks are structured on integration of the **three-dimensions**.	**No**	Materials do not address the three dimensions consistently or in an integrated way. The crosscutting concepts are not adequately addressed in the student edition or investigation manual and the instructional materials do not always provide teachers with guidance on how to address the crosscutting concepts. While the DCIs are addressed on a surface level, the content requires students to do simple recall of the Ideas. For example, standard HS-PS1-7 is partially addressed in Unit 6, Chapter 17, Section 2 (pages 388-396), with the focus on conservation of matter. Students balance chemical reactions using Mathematical and Computational Thinking, a SEP. However, the CCC Energy and Matter is not elevated in the learning sequence. Unit 6, Investigation 17B gives students an opportunity to use mathematics to support claims of conservation of mass during chemical reactions, addressing standard HS-PS1-7. Although this lab addresses the SEP and the DCIs, there is little focus on the CCC of Energy and Matter.

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			In Investigation 6A, question 5b, students are asked, "Why did the speed change when the same launch force was applied to cars of different mass? How do your observations support your answer?" They are asked to explain the correlation and support answers with evidence, which addresses the CCC Cause and Effect; however, students are not aware that they are making these connections and the instructional materials do not provide teachers with guidance on how to help students think about the CCC. In Unit 3, Chapter 7 (pages 164-186) the following DCIs are addressed: HS.PS3A.a, HS.PS3A.b, HS.PS3A.c (partially addressed). The SEP called for by standard HS-PS3-2 is Developing and Using Models with the integration of the CCC Energy and Matter. These two dimensions are not fully addressed in this section. Examples of types of energy are provided to the reader, but there are no connections between the examples provided to allow students to draw connections to types of energy transfer through the use of the CCC. Three-dimensional integration is rarely evident in provided assessments. For example, Unit 3 chapter tests include recall of facts or basic application of formulas presented throughout the chapters. This is similarly true in the Unit 5, Chapter 16 assessment. A question on page 378 states, "What is the chemical formula for water?" The Unit 6, Chapter 19 (page 467) assessment question asks, "What determines the strength of an acid?" Both of these examples require a basic recall of science content.
	2b) 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, arguments and explanations of theory development, and conclusions from investigations.	**No**	There is little variety in the types of tasks students are required to execute throughout the instructional materials. Students are offered some variety of optional extension projects at the end of the chapters, but these are not a core part of the curriculum.

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			Most of the investigations that students are asked to carry out are "cookbook" investigations in which the students follow the instructions listed in the investigation sheet and then answer questions based on things observed or measured in the investigation. For example, Investigation 21A (page 115) asks the students to follow directions to build a circuit then answer accompanying questions. The students are told to use measurements taken from the lab to help answer these questions, but they are not asked to produce a solution to a problem or come to a new conclusion that was not explicitly stated in the text. In Unit 5, Investigations 14A, 14B, 15A, and 15B (pages 75-84), students use a model of atoms and the periodic table, but do not have opportunities to develop arguments and explanations of the models. Some evidence could be found that an attempt was made to vary student products, such as in Unit 6, Lab 17A (page 95). In this example, students are expected to develop a lab report to communicate their findings on conservation of mass during a chemical reaction. However, this was the exception, not the general trend of the materials.
Non-Negotiable **3. 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** **3a)** Students have multiple opportunities to engage with **authentic sources** that represent the language and style that is used and produced by scientists. Examples could include 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.	**No**	There are few opportunities for students to engage with authentic sources that represent the language and style of scientists and engineers. Students do not interact with authentic sources for data analysis, interpretation, or to obtain, evaluate, and communicate information about scientific phenomena. Unit 3, Chapter 9 (pages 220-221) presents students with information connecting technologies that utilize simple machine and prosthetics. However, these lessons do not include data analysis, laboratory procedures, sample lab reports or impact analysis from advancement in technology.

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			Students are introduced to forensic engineers in Unit 2, Chapter 6 (pages 156-157), but the content is not connected to the DCIs. The materials address the content; students rely on the textbook for information. Although short stories are presented at the beginning of each chapter and science facts and biographies are included throughout the chapters, (page 512 for example), textbook readings are the principle sources with which students interact. Pictures in the textbook are primarily drawn or illustrated. Students have limited opportunities to interact with real-world photographs. In a few instances, students engage with authentic sources at the conclusion of a chapter. For example, in Unit 2, Chapter 4 (pages 100-101) students are introduced to High-Tech Animal Trackers in the Biology Connection. In Unit 5, Chapter 14 (page 328-329), students are introduced to Bioluminescence creatures in the Biology Connection. Although students read these articles, they are at the conclusion of the chapters and the majority of the reading that students engage with is in a historical textbook format.
	REQUIRED **3b)** Students regularly engage in **speaking and writing** about scientific phenomena and engineering solutions.	**No**	The instructional materials present students with few opportunities to speak and write about scientific phenomena or to engineer a solution. Writing prompts are centered on explanatory content, such as in Unit 3, Chapter 7, Section 7.1 (page 172), question 2. At times, students are asked to answer questions and write conclusions, but they are not prompted to share these conclusions with their peers. Investigations 23A (sections 6 and 7) and Investigation 6A (page 35) contain a curriculum component called "Arguing from Evidence." However, the questions don't require students to actually engage in arguments supported by evidence in writing or orally.

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			A few items within the student edition and investigation manual require students to apply their knowledge across dimensions and express their ideas in writing. For example, Chapter 7, Section 7.2 (page 176), Question 3 and Unit 4, Chapter 13 (page 309), offer opportunities for students to apply their knowledge. In Unit 6, Investigation 17A, students are able to develop a lab report to communicate their findings on conservation of mass during a chemical reaction.
	3c) 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.	**No**	Few authentic science sources are present in the text for students to acquire vocabulary and scientific knowledge through reading or investigations. Each section in the student edition presents vocabulary in a vocabulary box to point out what students should look for in the text. Vocabulary is then italicized throughout the text. Unit 5, Chapter 14.2 (page 322) provides an example of this. On page 540, the words "electric motor" and "rotor" are bolded in the text; then the words are written and defined again separately in the margin of the same page. In some examples, "Cold Reads" introduce students to different disciplines. This is evident in Unit 5, Chapter 16, "The Spin on Scrap Tires," and in Unit 6, Chapter 18, "Your Footprint Matters." However, these articles do not develop a deeper understanding of the physical science standards and key vocabulary terms.
	3d) Materials address the necessity of using **scientific evidence** to support scientific ideas.	**No**	The materials do not adequately require students to support scientific ideas with scientific evidence. When students are required to use evidence to support arguments, the instructional materials do not require them to use evidence from scientific or historical episodes in science and/or defend and critique claims using scientific reasoning. In Unit 4, Chapter 13 (page 303), the text utilizes a graph to support the comparison of altitude and air pressure. However, there is little use of graphs or

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			other data for students to interpret throughout the rest of the text. Investigation 22A, Section 4 (pages 123-124), Investigation 6A asks students to answer questions and then asks "How is your answer supported by your observations?" Although students use observations to support their ideas, the materials do not lead students to defend and/or critique claims using scientific reasoning.
Non-Negotiable **4. LEARNING PROGRESSIONS:** Materials are coherent and provide natural connections to other performance expectations including science and engineering practices, crosscutting concepts, and disciplinary core ideas; the content compliment the major priorities of Louisiana Student Standards for Math. ☐ Yes ☒ No	**REQUIRED** **4a)** The overall organization of the materials and the development of content skills and practices are coherent and support student mastery of the standards. The **progression of learning** is coordinated over time, clear and organized to prevent student misunderstanding.	**No**	Within a unit of study, the DCIs are addressed in such a way that students can gradually build a depth of understanding. For example, Unit 7, Chapter 20 discusses charges, then circuits, then voltage, and finally resistance. This is a logical progression of the topics in an order that will lead to student understanding. It is also arranged in such a way that the students will be able to apply all of this knowledge as they learn about and build series and parallel circuits in Unit 7, Chapter 21. In Unit 2, the instructional materials address position and speed and velocity then graphs of motion and acceleration. However, the materials do not progressively build basic-to-complex ideas for the crosscutting concepts and science and engineering practices. Students are not presented with opportunities to plan and conduct experiments. Most of the investigations include step by step instructions. This is inconsistent with Asking Questions and Defining Problems practice in the Louisiana Student Standards for Physical Science. The curriculum also provides few instances where students have the opportunity to develop and revise their own models to explore a phenomenon and/or use evidence from the models to support scientific thinking, which is required by the Developing and Using Models practice of the Louisiana Student Standards for Physical Science.

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	4b) Materials are **coherent**, sequenced within and across units to build students' depth of knowledge.	**No**	Crosscutting concepts and science and engineering practices are not a focus in the materials and there are no true coherent connections between units to allow for a deeper understanding of the physical science standards. The units are organized based on themes such as motion and forces, work and energy, matter and energy. This organization leads to some disconnect in the sequencing of the disciplinary core ideas between units. Nuclear chemistry is introduced in Unit 5, Chapter 14 (page 320) alongside atoms as radioactivity, but radioactive processes of fission and fusion are not discussed until Unit 6, Chapter 18 (page 422).
	4c) 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**	The text presents opportunities for students to utilize math skills from the high school grade band. In Unit 2, Chapter 6 (page 152), students are asked to use mathematical computations to solve the momentum of two hockey players, and they are asked to use the law of conservation of momentum to compute the speed that an astronaut moves backwards after throwing a wrench (page 153). However, the connections to the Louisiana Student Standards for Mathematics are not referenced in the materials. The teacher's edition (page 463) states that there will be mathematics connections dealing with Ohm's Law. However, it does not explicitly state the Louisiana Student Standards for Math that is connected to the performance expectation for HS-PS2-5.
SECTION II: ADDITIONAL INDICATORS OF QUALITY			
Additional Criterion **5. SCAFFOLDING AND SUPPORT:** Materials provide teachers with guidance to build their own knowledge and to give all students extensive opportunities and	**REQUIRED** **5a)** 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	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.

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support to explore key concepts using multiple, varied experiences to build scientific thinking. ☐ Yes ☐ No	in the science classroom (i.e. conversation guides, sample scripts, rubrics, exemplar student responses).		
	5b) 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.).	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
Additional Criterion **6. 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** **6a)** Text sets (when applicable), laboratory, and other scientific materials are **readily accessible** through vendor packaging.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	6b) 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.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	6c) The total amount of content is **viable** for a school year.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
Additional Criterion **7. 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** **7a) 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.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	7b) Scoring guidelines and rubrics **align** to performance expectations, and incorporate criteria that are specific, observable, and measurable.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
FINAL EVALUATION ***Tier 1 ratings*** receive a "Yes" in Column 1 for Criteria 1 – 7. ***Tier 2 ratings*** receive a "Yes" in Column 1 for all non-negotiable criteria, but at least one "No" in Column 1 for the remaining criteria. ***Tier 3 ratings*** receive a "No" in Column 1 for at least one of the non-negotiable criteria.			
Compile the results for Sections I and II to make a final decision for the material under review.			
Section	**Criteria**	**Yes/No**	**Final Justification/Comments**
I: Non-Negotiables	1. Alignment & Accuracy	**No**	The majority of the Louisiana physical science standards are not addressed in depth in the student edition. Most of the standards are only partially addressed in the student edition and investigation manual, focusing on the disciplinary core ideas and not the scientific and engineering practices or cross cutting ideas. Phenomena are rarely used to provide purpose for the lessons and to drive instruction in the student edition, teacher edition, or the investigation manual.
	2. Three-dimensional Learning	**No**	Three-dimensional learning is rarely integrated in the student edition. The cross cutting concepts are not explicitly addressed in the teacher's edition, student edition, or the investigation manual. The science and engineering practices and disciplinary core ideas are presented together in the investigation manual; however, these investigations are separate from the text, not integrated.
	3. Disciplinary Literacy	**No**	There are few opportunities for students to engage in authentic sources. Most of the student edition provides a series of rote memory and predictable lessons of direct instruction, followed by prescribed lab investigations, more direct instruction, review, reteach, and assess. Students are rarely required to speak and write about scientific phenomena and engineering solutions.
	4. Learning Progressions	**No**	The student edition focuses on the disciplinary core ideas; therefore, there is little support for students to master the physical science standards. Although the math skills embedded within the student edition chapters is within the high school grade band, the teacher's edition does not mention which math standards are utilized.

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II: Additional Indicators of Quality	5. Scaffolding and Support	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	6. Usability	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	7. Assessment	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
FINAL DECISION FOR THIS MATERIAL: **Tier III, Not representing quality**			

Strong science instruction requires that students:

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

Title: **CPO Foundations of Physics, 2nd edition** Grade/Course: **Physics**

Publisher: **Delta Education, LLC** Copyright: **2016**

Overall Rating: **Tier III, Not representing quality**

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

STRONG	WEAK
	1. Alignment Accuracy (Non-Negotiable)
	2. Three-dimensional Learning (Non-Negotiable)
	3. Disciplinary Literacy (Non-Negotiable)
	4. Learning Progressions (Non-Negotiable)

To evaluate each set of submitted materials for alignment with the standards, begin by reviewing the indicators listed in Column 2 for the non-negotiable criteria. If there is a "Yes" for all required indicators in Column 2, then the materials receive a "Yes" in Column 1. If there is a "No" for any required indicator in Column 2, then the materials receive a "No" in Column 1.

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

Tier 1 ratings receive a "Yes" in Column 1 for Criteria 1 – 7.
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SECTION I: NON-NEGOTIABLE CRITERIA: Submissions must meet all of the non-negotiable criteria in order for the review to continue.			
Non-Negotiable **1. ALIGNMENT & ACCURACY:** Materials adequately address the Louisiana Student Standards for Science. Explaining phenomenon and designing solutions drive student learning. ☐ Yes ☒ No	**REQUIRED** **1a)** The majority of the Louisiana Student Standards for Science are incorporated, to the full **depth of the standards**.	**No**	Less than 10% of Louisiana Student Standards for Physics are fully addressed by the instructional materials. Most of the instructional materials address the disciplinary core ideas (DCIs). However, the science and engineering practices (SEPs) and crosscutting concepts (CCCs) are not fully addressed in the materials. Standard HS-PS2-1 is partially covered in Unit 2, Chapter 5, Section 2 (page 103). The unit covers the DCI of Newton's second law with formulas and examples. In Investigation 5.2 (pages 29-31), students analyze data. However, the CCC Cause and Effect is not explicitly addressed in the student edition nor the investigation manual. Unit 3, Chapter 8, Section 3 (page 175), and Unit 9, Chapter 30, Section 2 (page 54) partially covers standard HS-PS2-4. The book gives the formula for Newton's Law of Gravitation but does not fully address the DCI; it rarely references electrostatic forces and students have few opportunities to predict gravitational forces between objects. Standard HS-PS-2-4 is partially addressed in Unit 7, Chapter 21, Section 2. The DCI dealing with Electrostatic forces and Coulomb's law is addressed in the instructional resources. In Investigation 22.2 (pages 173-175), students investigate Coulomb's law. However, the CCC regarding patterns is not a focus in these sections.
	REQUIRED **1b)** Observing and **explaining phenomenon** and **designing solutions** provide the purpose and opportunity for students to engage in learning.	**No**	Observing and explaining phenomena do not provide the purpose for learning. The instructional materials rarely use phenomena on the unit and lesson level to drive student learning. Unit 4, Chapter 10 (pages 218-219), describes how the Hoover Dam harvests the kinetic energy of the

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			Colorado River and converts it into electricity. The reading provides students with examples of calculations and describes the amount of energy provided. However, the students are not expected to apply their scientific learning to explain this phenomenon and the phenomenon does not set the purpose for learning. In Investigation29.3 (page 242), students are asked to research nuclear energy, but students do not observe or explore a real-world phenomenon dealing with nuclear energy.
	REQUIRED **1c)** Science content is **accurate**, reflecting the most current and widely accepted explanations.	**Yes**	The science content is accurate and represents the most up-to-date knowledge.
	1d) In any one grade or course, instructional materials spend minimal time on content outside of the course, grade, or grade-band.	**No**	The majority of the instructional materials include content that is outside of Louisiana Student Standards for Physics. Much of the content in Unit 2 addresses middle school disciplinary core ideas. Unit 2, Chapter 5.1: The First Law: Force and Inertia addresses MS.PS2A.a, MS.PS2A.b, MS.PS2A.c, and MS.PS2A.d, which is in the middle school grade band. The instructional materials are frequently aligned to the Louisiana Student Standards for Chemistry and Physical Science. For example, Unit 8, Chapter 27 addresses gas laws and buoyancy, which is aligned to the Louisiana Student Standards for Chemistry. Unit 9, Chapter 30, Section 2 addresses standard HS-PS2-4, Newton's Law of Gravitation, which is aligned to the Louisiana Student Standards for Physical Science. Chapters 2-3 includes disciplinary core ideas aligned to the Louisiana Student Standards for Physical Science. Although most of the activities are below the high school grade band, there are a few instances where the activities are at the high school level. For example, Investigation 7.2 of Unit 3 (page 118), guides students to create a mathematical model for

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			projectiles, which aligns to the SEP "Using Mathematics and Computational Thinking."
Non-Negotiable **2. THREE-DIMENSIONAL LEARNING:** Students have multiple opportunities throughout each unit to develop an understanding and demonstrate application of the three dimensions. ☐ Yes ☒ No	**REQUIRED** **2a)** Materials teach the science and engineering practices, crosscutting concepts and disciplinary core ideas separately when necessary but they are most often integrated to support deeper learning. Assessment items and tasks are structured on integration of the **three-dimensions**.	**No**	Materials do not address the three dimensions consistently or in an integrated way. The CCCs are not adequately addressed in the student edition or investigation manual. While the DCIs are addressed on a surface level, the content requires students to do simple recall of the Ideas. Unit 4, Chapter 11 (page 227) uses the idea of natural systems and their efficiency to help students conceptualize the conversion of energy throughout natural systems as called for by the DCIs in standard HS-PS3-1. However, the lesson does not fully incorporate the SEP Using Mathematics and Computational Thinking. Unit 4, Chapter 12 (page 255) addresses angular momentum. The text builds on information covered from Chapter 9 of the text. Students explore the mathematical connection of angular momentum and conservation of energy; however, students are provided examples and no opportunity for exploration or student-centered investigation. In Unit 8, Chapters 25-27, the investigations are prescribed step-by-step investigations where students are told what and how to analyze their data. Students do not engage in the science and engineering practices that are appropriate for the high school grade band.
	2b) 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, arguments and explanations of theory development, and conclusions from investigations.	**No**	There is little variety in the types of tasks students are required to execute throughout the instructional materials. Students are not asked to produce solutions to problems, develop models of phenomenon, compose arguments and explanations of theory development, or draw conclusions from student-designed investigations. Students are most often expected to answer content-based questions using the text or recall formulas to answer questions. The Unit 4, Chapter

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			12, Section 12.1 skills sheet asks students to apply mathematical skills that require basic recall level understanding of the formulas presented. In Investigation11.1, students explore the concept of efficiency and the loss of energy of a system through data collection on a track. However, students are provided a step-by-step procedure on how to carry out the investigation and details on how to analyze and interpret their data. Students have some opportunity to engage in different types of tasks such as analyzing collected data (Investigation 6.3), using a model (Investigation 28.2) and collecting and analyzing data from an investigation (Investigation 23.2). However, the majority of these tasks are not connected to real world phenomena and require students to recall content and/or follow prescribed "cookbook investigations."
Non-Negotiable **3. 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** **3a)** Students have multiple opportunities to engage with **authentic sources** that represent the language and style that is used and produced by scientists. Examples could include 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.	**No**	There are few opportunities for students to engage with authentic sources that represent the language and style of scientists and engineers. Students do not interact with authentic sources for data analysis, interpretation, or to obtain, evaluate, and communicate information about scientific phenomena. Unit 4, Chapter 10 (page 209), presents the concept of work. One section of the resources has figures of people walking up stairs and an explanation of work being conducted, a crane lifting a steel beam. The materials do not compare the amount of work being done by the crane compared to that of the person walking up the stairs or encourage students to speak and write about the differences between the two examples. Unit 3, Chapter 8 (page 169) uses videos, but they are instructional in nature and do not require students to use the SEPs to make sense of them.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			When STEM connections are included at the end of the chapters, such as the story "Freak Waves" at the end of Unit 5, Chapter 14, and "The Large Hadron Collider" at the end of Unit 9, Chapter 30, these stories are anecdotes that tie into the lesson that has just been taught; they do not require students to engage in speaking and writing about the science behind the story.
	REQUIRED **3b)** Students regularly engage in **speaking and writing** about scientific phenomena and engineering solutions.	**No**	The instructional materials present students with few opportunities to speak and write about scientific phenomena or to engineer a solution. Most writing opportunities focus on the DCIs and are not connected to real world phenomena. For example, Unit 4, Chapter 11 (page 242) requires students to prepare a report and complete research about natural cycles and solar cells. In Unit 8, Chapter 25, page 542, Apply Your Knowledge section, students are asked to explain and conduct research on the specific heat of hydrogen. In Unit 1, Chapter 4, page 98, Apply Your Knowledge section, students are asked to "Describe how absence of air resistance will affect people on Earth?" In these three examples, the writing is centered on students explaining disciplinary core ideas instead of real world phenomena. At the conclusions of investigations, students rarely communicate and/or engage in arguments with their peers. Investigation 28.1, page 229, "Compare the Size of a Nucleus to the Entire Atom" asks students to, "Write a paragraph of how this activity is like the gold foil experiment." Investigation 22.3, Arguing From Evidence, Question A (page 185), requires students to respond to this prompt, "The bodies of automobiles are made of magnetic steel, yet you can buy a compass for your car. Some cars even have electronic compasses build in. Based on your observations, would your trust directions from a compass inside a car?" In both examples, the materials do not prompt students to discuss their responses with their peers, instead students write

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			simple explanations based on information learned from the student edition or measurements taken in the investigation.
	3c) 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.	**No**	Few authentic science sources are present in the text for students to acquire vocabulary and scientific knowledge through reading or investigations. Most vocabulary is presented at the opening of the chapter, such as the vocabulary words listed on page 499. Vocabulary words are reviewed at the conclusion of the chapter in the chapter assessment. Unit 7, Chapter 24 (page 516); Unit 5, Chapter 14.2 (page 322); and Unit 3, Chapter 7 (page 162) are examples of how vocabulary is addressed in isolation at the conclusion of a chapter.
	3d) Materials address the necessity of using **scientific evidence** to support scientific ideas.	**No**	The materials do not adequately require students to support scientific ideas with scientific evidence. When students are required to use evidence to support arguments, the instructional materials do not require them to use evidence from scientific or historical episodes in science and/or defend and critique claims using scientific reasoning. The instructional materials rarely require or encourage students to support their ideas with evidence when answering questions in the text. For example, when graphs are used in Unit 4, Chapter 13 (page 303) and Unit 1, Chapter 3 (page 66) the text explains the graphs. Students do not independently analyze and interpret the graphs and/or use the graphs to support scientific thinking and ideas. Students are not consistently encouraged to use evidence from investigations to support their ideas and conclusions. In Investigation 18.2: Interference, Diffraction, and Polarization (page 145), Question A states “Describe the motion of the spring using the terms horizontal polarization and vertical polarization.” Students are not required to use evidence from the investigation to support their

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			response or scientific idea. Instead, students use information from the student manual to respond to the question.
Non-Negotiable **4. LEARNING PROGRESSIONS:** Materials are coherent and provide natural connections to other performance expectations including science and engineering practices, crosscutting concepts, and disciplinary core ideas; the content compliment the major priorities of Louisiana Student Standards for Math. ☐ Yes ☒ No	**REQUIRED** **4a)** The overall organization of the materials and the development of content skills and practices are coherent and support student mastery of the standards. The **progression of learning** is coordinated over time, clear and organized to prevent student misunderstanding.	**No**	Within a unit of study the DCIs are addressed in such a way that students can gradually build a depth of understanding. Simple ideas are introduced first and the instructional materials gradually build up to more complex ideas. Unit 5, Chapter 14 introduces the properties of waves, measurements of speed, frequency, wavelength, and amplitude. This allows a logical progression to applying those values to different types of waves such as sound (Chapter 15) and light (Chapter 16). However, the lack of integration of the SEPs and CCCs in the curriculum do not allow students to progressively build basic to complex ideas of content skills and practices. Investigations often require students to follow instructions to build a model to explore science content and do not require students to revise their own models. In Investigation 28.2 (page 233), students are given directions to build a model and use their models to play a game to explore electrons and quantum states. However, students do not revise or use their models to explain phenomenon. The instructional materials also prescribe the steps that students should follow when completing investigations. For example, Investigation 17.2: Mirrors, Lenses, and Images; Investigation 8.1: Motion in Circles; and, Investigation 29.1: Radioactivity provide students with detailed step by step instructions on how to carry out the investigation. In all of these examples, students do plan and conduct an investigation individually or collaboratively as called for by LSSS.
	4b) Materials are **coherent**, sequenced within and across units to build students' depth of knowledge.	**No**	Due to the lack of integration of the SEPs and CCCs, the materials are not coherent within and across units to build students depth of understanding. The

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
			teacher's edition lists the CCCs, but they are not used to help students connect their learning within or between units.
	4c) 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**	The text presents opportunities for students to utilize math skills from the high school grade band. Standard A1, A-CED.A.4 is addressed in Unit 2, Chapter 5.2 (pages 103-105). In this unit, students are asked to rearrange the formula for acceleration in order to solve for force and then mass of object. However, the connections to the Louisiana Student Standards for Mathematics are not referenced in the materials. Standard, A1, F-IF.C.7 is addressed in Investigation 5.2, Section 4, but the Louisiana Student Standards for Math are not explicitly referenced. Students graph acceleration, force data, and determine the slope and y-intercept. Students are then asked to determine how the two variables are related which coincides with math standard A1, S-D.B.6, but the standard is not referenced in the materials.
SECTION II: ADDITIONAL INDICATORS OF QUALITY			
Additional Criterion **5. 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** **5a)** There are separate **teacher support** materials including: scientific background knowledge, support in three-dimensional learning, learning progressions, common student misconceptions and suggestions to address them, guidance targeting speaking and writing in the science classroom (i.e. conversation guides, sample scripts, rubrics, exemplar student responses).	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	5b) 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.).	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
Additional Criterion **6. 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** **6a)** Text sets (when applicable), laboratory, and other scientific materials are **readily accessible** through vendor packaging.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	6b) 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.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	6c) The total amount of content is **viable** for a school year.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
Additional Criterion **7. 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** **7a) 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.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	7b) Scoring guidelines and rubrics **align** to performance expectations, and incorporate criteria that are specific, observable, and measurable.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.

FINAL EVALUATION

Tier 1 ratings receive a "Yes" in Column 1 for Criteria 1 – 7.

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

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

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

Section	Criteria	Yes/No	Final Justification/Comments
I: Non-Negotiables	1. Alignment & Accuracy	**No**	The student edition in conjunction with the investigation manually partially covers most of the standards. Phenomena are rarely used to provide purpose for the lessons and to drive instruction.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
	2. Three-dimensional Learning	**No**	Three-dimensional learning is rarely integrated in the student edition. Students are provided little opportunity throughout the introduction of new concepts or through the deepening of concepts to engage in the three dimensions of learning that are important for ensuring students develop a rich and detailed understanding of concepts discussed. There is very little variety in the types of tasks students are required to execute throughout the student edition
	3. Disciplinary Literacy	**No**	There are few authentic sources (such as journal excerpts, media releases, real photographs, and sections of lab reports) for students to use for three-dimensional learning in either the student edition or investigation manual. There are few opportunities for students to speak and write about scientific phenomena or engineering solutions in the student edition or investigation manual.
	4. Learning Progressions	**No**	The Disciplinary core ideas are addressed in such a way that the students can build up to more complex ideas. Crosscutting concepts are not explicitly a focus throughout the student edition or investigation manual; therefore, there is no progression of learning for crosscutting concepts. The student edition does not focus on science and engineering practices, so again there is no progression of learning in this area.
II: Additional Indicators of Quality	5. Scaffolding and Support	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	6. Usability	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	7. Assessment	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
FINAL DECISION FOR THIS MATERIAL: **Tier III, Not representing quality**			

Appendix I.

Publisher Response

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: **CPO Foundations of Physical Science 3rd edition, CPO Foundations of Physics, 2nd edition**

Publisher: **Delta Education, LLC** Grade/Course: **Physical Science, Physics** Copyright: **2018, 2016**

Overall Rating: **Tier III, Not representing quality**

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

STRONG	WEAK
	1. Alignment Accuracy (Non-Negotiable)
	2. Three-dimensional Learning (Non-Negotiable)
	3. Disciplinary Literacy (Non-Negotiable)
	4. Learning Progressions (Non-Negotiable)

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 received a "Yes" for all Criteria 1-7.
Tier 2 ratings received a "Yes" for all non-negotiable criteria, but at least one "No" for the remaining criteria.
Tier 3 ratings received a "No" for at least one of the non-negotiable criteria.

Click below for complete grade-level reviews:

Physical Science (Tier 3) Physics (Tier 3)

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: **CPO Foundations of Physical Science, 3rd edition** Grade/Course: **Physical Science**

Publisher: **Delta Education, LLC** Copyright: **2018**

Overall Rating: **Tier III, Not representing quality**

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

STRONG	WEAK
	1. Alignment Accuracy (Non-Negotiable)
	2. Three-dimensional Learning (Non-Negotiable)
	3. Disciplinary Literacy (Non-Negotiable)
	4. Learning Progressions (Non-Negotiable)

To evaluate each set of submitted materials for alignment with the standards, begin by reviewing the indicators listed in Column 2 for the non-negotiable criteria. If there is a "Yes" for all required indicators in Column 2, then the materials receive a "Yes" in Column 1. If there is a "No" for any required indicator in Column 2, then the materials receive a "No" in Column 1.

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

Tier 1 ratings receive a "Yes" in Column 1 for Criteria 1 – 7.
Tier 2 ratings receive a "Yes" in Column 1 for all non-negotiable criteria, but at least one "No" in Column 1 for the remaining criteria.
Tier 3 ratings receive a "No" in Column 1 for at least one of the non-negotiable criteria.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
SECTION I: NON-NEGOTIABLE CRITERIA: Submissions must meet all of the non-negotiable criteria in order for the review to continue.				
Non-Negotiable **1. ALIGNMENT & ACCURACY:** Materials adequately address the Louisiana Student Standards for Science. Explaining phenomenon and designing solutions drive student learning. ☐ Yes ☒ No	**REQUIRED** **1a)** The majority of the Louisiana Student Standards for Science are incorporated, to the full **depth of the standards**.	**No**	Less than 10% of the Louisiana Student Standards for Physical Science are fully covered by the instructional materials. Instructional materials generally include partial alignment or full alignment to the disciplinary core ideas (DCIs) but rarely include the science and engineering practices (SEPs) and crosscutting concepts (CCCs). Unit 4, Chapter 11 addresses HS-PS3-4 but only the following disciplinary core ideas: HS.PS3B.b, HS.PS3B.e, HS.PS3B.a. The standard calls for students to plan and conduct an investigation and provide evidence to support the Second Law of Thermodynamics. Investigation 11A attempts to address this practice but provides all of the necessary steps students should take for the investigation; it does not allow students to plan the investigation, which is called for by the SEP. The CCC, Systems and System Models, is not adequately addressed in the activities or text. Partial attainment of the standard HS-PS4-1 was achieved. Unit 8, Chapter 23 (pages 564-567) and Chapter 2 (page 588) includes the SEP Mathematics and Computational Thinking in regards to frequency and wavelength. However, the full extent of the performance expectation is not met; the mathematics does not apply to how the waves change when passing through various media. Unit 8, Chapter 25 also covers optics but does not apply the mathematics to explain how lenses change the properties of waves. Cause and Effect, the CCC, is not explicitly addressed.	Given the nature of LA ONLINE only submission process and our inability to converse efficiently in real time, we were not able to present our FULL program's depth and complexity, nor it's instructional design for commitee consideration. In previous years, in-person presentations to committees allowed us to more fully demonstrate how all of our program components form a learning system, not a traditional textbook program. Without such face to face demonstration, we could not adequately show how each of the components of either submittted programs dovetail to engage all students of various backgrounds and experiences to achieve the LA performance standards. Four additional components that extend this program beyond the required grade level background, knowledge, and skills needed students are: the CPO designed equipment, use of our investigation engineering design log, implementation training, and the use of the teacher's guide with 5-E lesson cycle with investigation master dialogs. The program can be both challenging to review and implement. The CPO program is also designed to advance teacher professional development from current lecture based instuction, or their tendency to teach to the top 10% of the students in their class. Given that this program is intended to both remediate and prepare students to advance through more Science courses, special attention is paid to bolstering experiential learning. Our learning systems apply a modified 5-E lesson cycle, through guided inquiry for a first investigation, then introduce simple options for advancing topics culminating in an engineering design log. The student edition's use of a "one main idea per page" approach allows teachers to select and use only the content needed by the individual

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
				student or entire class, to access it, and integrate it throughout the lesson cycle. How teachers do that is somewhat open ended given their prescribed class lengths, calendar constraints, student populations, and necessary individual student accomodations. It is apparent from the comments, the desired student performance objectives could appear to be missing or limited in scope, especially because the reviewer routinely only cites student text content, not the teacher guide dialogs, nor investigation sections in which the students learn experiencially PRIOR to using the student text. Delta Education and CPO Science do not believe instruction should be driven by a textbook, nor that NGSS science standards can be taught without doing real science. The response at the left is a traditional way to review "traditional textbook programs," which are not in line with research-based or NSTA instructional best practices, nor CPO Science's program implementation strategies. One of our learning systems' greatest strengths is how the student text, investigation manual, equipment versatility, and implementation training make it possible for teachers to customize almost any topic to any length and to a variety of learning environments or student needs. We will attempt to explain as best we can in complete detail below. Note: We have applied the following abbreviations for brevity and to reduce resource confusion. FPS3: Foundations of Physical Science 3rd edition program TG: Teacher Guide SE: Student Edition IM: Investigation Manual OLR: On-Line Resource 1a. It is stated at the left that "less than 10% of the Science standards are met upfront, yet the reviewer does not quantify how this conclusion was drawn when only the SE and IM were reviewed. The

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
				teacher investigation dialogs (TG) used with equipment drive instruction, in which connections are routinely made through discussion and collaboration for both CCCs and SEPs. Since Physical Science is not usually tied to a specific grade level, because it is usually be taught for remediation in 9th, 10th, 11th or 12th grade. Students on track for success in NGSS normally proceed to directly to Biology, Chemsitry, Earth Science, or Physics then to AP or IB Courses. In fact, Physical Science was not originally listed as a course LA planned to offer. However if a LA expectation for Tier III approval is to align our program to specific LA Math Standards, we are requesting an extension to fully correlate and resubmit that alignment for Physical Science. 1a. Energy and Matter CCC and SEPs Unit 4 Chapter 11 content is taught in the appropriate context as students learn about measuring properties of matter and distinguish heat from temperature. Later, in Ch17 scaffolds the same CCC Energy and Matter as students approach the same concept using Specific Heat. In Ch18 students apply the conservation of atoms in nuclear reaction when playing a game in Inv 18C for CCC Energy and Matter. During Inv 11B, having already provided a model for students to measure heat and quantities accurately, they can proceed to the Engineering Design Log to begin designing any number of prototypes that demonstrate improving or decreasing heat exchange through matter with simple materials readily and locally available. The purpose of the Engineering Design Log is to allow teachers more leeway in variety of teaching environments on the materials used or projects completed from year to year. 1a. Measurment of Waves Inv 23B has students collecting frequency data to the nearest 100th of Hz, fractionally deduce the wavelenth of a single standing wave produced on an

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
				elastic string, and visually "seeing" harmonics. Some students notice after partially completing the table that frequency and wavelenth data vary inversely. Others require time to develop the concept so they can eventually derive the algebraic formula for speed. It is necessary to refer to the OLR "Equipment set up video" on Curiosity Place.com to see this equipment in action. It is listed under the Resources by Type Menu or Chapter 23 Teacher Resources by Section. Further, on IM pages 132-133, the students gather data in Part 3 as they explore where natural resonance occurs and varies randomly within each student group as the teacher sets the tension. Students share and compare data differences among and across groups. Additionally the teacher has the opportunity to discuss statistically significant change between individual data points, before students construct their own equation from this data in Part 4c. The formula for the speed of a wave would not be reviewed or taught, but depends on application of prior learning and retention. This is evidenced by accessing the TG investigation dialog and sample answers tables and graphs student produce during Inv. 23A and 23B. on TG pages 515, 517, 519, and 524. Since the reviewer can not view in real-time how the use of the CPO equipment such as the DataCollector and CPO Sound & Waves kit are used to advance math understanding, we refer to the OLR Equipment set up video for Sound and Waves. This can be located using the TAB and drop down menu under Teacher "Resources by Type" or tab "Resources by Section" for Chapter 23. Additionally Inv. 24B p139 and 23C has students investigating waves produced with air, springs and in water and comparing frequencies.
	REQUIRED **1b)** Observing and **explaining phenomenon** and **designing solutions** provide the purpose and opportunity for students to engage in learning.	**No**	Observing and explaining phenomena do not provide the purpose for learning. The instructional materials rarely use phenomena to drive student learning.	Again, the SE does not drive the CPO Science instructional sequence. Our TG connects every section of each the SE to a full lesson cycle. Chapter and Section choices can be customized by the teacher, given the scope of the local district's

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
			Unit 5, Chapter 14 (page 313) introduces students to bioluminescent creatures. However, students do not deeply develop an understanding of the phenomenon or make sense of how and why the phenomenon takes place. Bioluminescence is mentioned on pages 328-330. The questions at the end of the reading section such as, "Which energy source provides energy for bioluminescent animals?" do not set the purpose for learning. Each chapter in the student edition begins with a story. However, the stories are not used as an anchoring phenomenon and students do not explore or complete lesson investigations connected to the stories. The stories have questions that are proposed to the students, but the students are not engaged in investigating these throughout the sequence of learning.	semester timeline, reporting period, student population, class period length, and classroom unique attributes or needs. The TG lessson cycle in FPS3 is modified from a researched 5-E model: Connect to Prior Knowledge and Motivate= Engage Investigation A= Explore Presenting Key Content= Explain Reteach and InvB or InvC Throughout each IM (performance based) and content , Section Review and Chapter Assessement= Evaluate 1b. Using the same Chapter (23) Lesson cited in 1a, TG p518, Lesson 23.1 provides two opportunities to connect to students prior knowledge: the use of a metronome in music and the recommendation to the invite a musician or to integrate music as it will pertain later to the next chapter's investigations of frequency and sound (24A, 24B, 24C). This leads directly to SE p. 556 and ties in with IM Inv 24A. The assumption that a single cohesive storyline can be presented to all secondary students progressing via the same timeline or independent of other local or world developments eliminates the ability for a lesson to take different classroom or student-centered trajectories. It removes all creativity of thought on the part of the teacher as they plan or modify or choose when and how our wide range of CPO resources can be used into each local school calendar, week, day or period.
	REQUIRED **1c)** Science content is **accurate**, reflecting the most current and widely accepted explanations.	**Yes**	The science content is accurate and represents the most up-to-date knowledge. For example, the Periodic Table on page 336 includes the most recently discovered elements.	1c. We agree!
	1d) In any one grade or course, instructional materials spend minimal time on content outside of the course, grade, or grade-band.	**No**	The majority of the instructional materials include content that is outside of the grade level for high school Physical Science. Much of the content in Unit 2 addresses the middle	The SE content is intentionally designed to be easily accessible to remove ALL barriers to reading encountered by students in a typical diverse and integrated 8th or 9th -12th grade classroom. The page layout is landscape to mirror the way most students

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
			school standards in the MS-PS2 cluster. Chapter 18, Section 1 (pages 410-413) includes endothermic and exothermic reactions, which is content that is also aligned to the middle school standards. Unit 3 includes mathematical concepts related to the course; however, the instructional materials focus on basic computational skills and lack the rigor that is needed to reach the end of year performance expectations. Specifically, in Unit 3, Chapter 8 (page 192), the section review asks students to apply mathematical skills that require basic recall of the formulas presented. Units 7 and 8 include the following standards, which are beyond the expectations of the Louisiana Student Standards for Physical Science: HS-PS4-2, HS-PS 4-3, and HS-PS 4-5.	encounter information on a typical webpage. Each page of the text covers ONE single topic, making reading digestible in short sessions. The main idea and new vocabulary are both embedded at the top of each page for poor readers, quick review or studying key concept relationships. The subtopic paragraph main ideas are pulled out at the left margin to make the reading accessible to all students. Gifted (often impatient) students can quickly skim content and formulas or graphics. That all students are NOT reading on grade level has been demonstrated across LA. Teachers now have the flexibilty to access and have students read a specific page within a 10 minute timeframe and apply the content directly to an IM experience, lesson in our cycle, or OLR. 1d. Units 7 and 8 and other topics considered extraneous, are included since Physical Science is sometimes used to remediate for graduation. Students who fail LA Chemistry or Physics, might still graduate with a Science credit and still achieve on the ACT or other standardized assessments.
Non-Negotiable **2. THREE-DIMENSIONAL LEARNING:** Students have multiple opportunities throughout each unit to develop an understanding and demonstrate application of the three dimensions. ☐ Yes ☒ No	**REQUIRED** **2a)** Materials teach the science and engineering practices, crosscutting concepts and disciplinary core ideas separately when necessary but they are most often integrated to support deeper learning. Assessment items and tasks are structured on integration of the **three-dimensions**.	**No**	Materials do not address the three dimensions consistently or in an integrated way. The crosscutting concepts are not adequately addressed in the student edition or investigation manual. While the DCIs are addressed on a surface level, the content requires students to do simple recall of the Ideas. For example, standard HS-PS1-7 is partially addressed in Unit 6, Chapter 17, Section 2 (pages 388-396), with the focus on conservation of matter. Students balance chemical reactions using Mathematical and Computational Thinking, a SEP. However, the CCC Energy and Matter is not elevated in the learning sequence. Unit 6, Investigation 17B gives students an opportunity to use mathematics to support claims of conservation of mass during chemical reactions,	The reviewer cites only the SE pages as if it contains all the "answers" or all of the needed "information" pertainent to the CCCs or SEPs as if these can only be achieved by reading about them. The heading is about three dimensional "learning" and can be measured through application during other instructional events. Our TG lesson cycle, investigation dialogs, and Engineering Design Log can also perform this function. Our SE is a resource to be integrated during and after experiential learning takes place hands-on. Students are not expected to "get through" or read every page of every chapter. The LA correlations focus on exactly where specific resources can be found, but additional resources must be used properly to allow teachers to consider the need of every individual student. Some may need remediation and some need extension.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
			addressing standard HS-PS1-7. However, although this lab addresses the SEP and the DCIs, there is little focus on the CCC of Energy and Matter. In Investigation 6A, question 5b, students are asked, "Why did the speed change when the same launch force was applied to cars of different mass? How do your observations support your answer?" They are asked to explain the correlation and support answers with evidence, which addresses the CCC Cause and Effect; however, students are not aware that they are making these connections and the instructional materials do not provide teachers with guidance on how to help students think about the CCC. In Unit 3, Chapter 7 (pages 164-186) the following DCIs are addressed: HS.PS3A.a, HS.PS3A.b, HS.PS3A.c (partially addressed). The SEP called for by standard HS-PS3-2 is Developing and Using Models with the integration of the CCC Energy and Matter. These two dimensions are not fully addressed in this section. Examples of types of energy are provided to the reader, but there are no connections between the examples provided to allow students to draw connections to types of energy transfer through the use of the CCC. Three-dimensional integration is rarely evident in provided assessments. For example, Unit 3 chapter tests include recall of facts or basic application of formulas presented throughout the chapters. This is similarly true in the Unit 5, Chapter 16 assessment. A question on page 378 states, "What is the chemical formula for water?" The Unit 6, Chapter 19 (page 467) assessment question asks, "What determines the strength of an acid?" Both of these examples require a basic recall of science content.	Using student content pages to assume this is where SEPs and CCCs will be learned or applied is again a misunderstanding of the integration of how our equipment, TG, SE, and IM provide unique opportunies in every section's lesson cycle or how learning progresses through each investigation. Typical Lesson Cycle: Teachers assess student readiness first in an OLR pre-assessment. Students then complete an A level investigation in which phenomena and experiences are modeled, then data are gathered and analyzed through student collaboration. Section (or page reading) is assigned or integrated as needed. Key concepts are discussed, with opportunities for reteach or extension. At this point teacher's can extend to a B or C level investigation or students design their own solutions using our Engineering Design Log. 2a. See 1a Energy of Matter. Unit 6 Inv 17B is not the only place students are expected to encounter the CCC Energy and Matter. As stated in the correlation, Inv 11B is associated with an earlier chapter about the properties of matter, measuring quantities of matter, and how energy transfer takes place using different pure metal samples. 18C is a third investigation. Mass and Energy conservation and conversions are extensively investigated in 7A and 7B. TG dialog p135-136 for Inv 6A specifically distinguishes cause from correlation. The students are not randomly applying forces and changing masses, they are changed incrementally in separate IM sections, while the other variable is controlled. Each variable is graphed separately and appropriately. Then the equation is modeled. Opportunities to "elevate the concepts of Energy and Matter" are provided in multiple ORL and connections students make in group and class discussion with the teacher through active dialog during Inv . Natural connections will be made in the

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
				use of simple materials with the engineering design log as students consider common (but teacher available or preferred) classroom supplied materials such as cups made of styrofoam, plastic, and glass. If there is no plan for LA or local district professional development for teachers needing such guidance, Delta Education, CPO Science offer tiered pricing for (including free) professional development for each of our programs. There are five opportunities for student assessment provided in the CPO program found here: TG p415 Exit Tickets SE Section Review and Chapter Assessments are formative in nature, intended to review and remediate basic content by section prior to using the summative OLR provided by Exam View. IM The hands-on investigations are where assessment is also more open ended with a focus on short answer, analysis, and drawing conclusions. OLR Chapter Assessments multiple choice .pdf resources are provided for students with no access to laboratory investigation, or those removed from laboratory instruction. The CPO implementation training provides teachers with the Exam View training so teachers can access and use a full range of provided multi-format questions in the CPO Test Bank including essay and short answer. Use of the CPO OLR Exam View to modify, create, and insert their own questions can accessed using the Quick test Wizard or more fully customized to produce multiple versions of assessments or modified test questions. We also provide and model rubric and performance-based assessment opportunities within the TG, IM and OLR.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
	2b) 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, arguments and explanations of theory development, and conclusions from investigations.	**No**	There is little variety in the types of tasks students are required to execute throughout the instructional materials. Students are offered some variety of optional extension projects at the end of the chapters, but these are not a core part of the curriculum. Most of the investigations that students are asked to carry out are "cookbook" investigations in which the students follow the instructions listed in the investigation sheet and then answer questions based on things observed or measured in the investigation. For example, Investigation 21A (page 115) asks the students to follow directions to build a circuit then answer accompanying questions. The students are told to use measurements taken from the lab to help answer these questions, but they are not asked to produce a solution to a problem or come to a new conclusion that was not explicitly stated in the text. In Unit 5, Investigations 14A, 14B, 15A, and 15B (pages 75-84), students use a model of atoms and the periodic table but do not have opportunities to develop arguments and explanations of the models. Some evidence could be found that an attempt was made to vary student products, such as in Unit 6, Lab 17A (page 95). In this example, students are expected to develop a lab report to communicate their findings on conservation of mass during a chemical reaction. However, this was the exception, not the general trend of the materials.	2b The reviewer keeps referrring to SE as the "curriculum." The CPO Science curriculum consists of TG, SE, IM, and OLR. We do try to strip down the SE content to eliminate the teacher depending on a textbook to fill the entire class period instead of using experiential learning. The reviewer may not have noticed the following included features that permit many "jumping off" points to make lessons more dynamic and relevant. TG Lesson Cycle unique for each section of a chapter: p118 Connect to Prior Learning, Motivate, Art & Friction inquiry online research p144 Design a Catpult p167 Family Energy Plan SE: Section sidebars embedded such as: p9, 13 Challenge! p17, Journal and KeyWords p25 #3 Chapter Connection includes a research extension Unit features: Try this At Home SE Chapter Connections SE Chapter Activities, OLR simulations OLR content videos, IM investgations A B C, or use of the engineering design log is not enough variety per chapter is confusing to us.
Non-Negotiable **3. 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** **3a)** Students have multiple opportunities to engage with **authentic sources** that represent the language and style that is used and produced by scientists. Examples could include 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	**No**	There are few opportunities for students to engage with authentic sources that represent the language and style of scientists and engineers. Students do not interact with authentic sources for data analysis, interpretation, or to obtain, evaluate, and communicate information about scientific phenomena. Unit 3, Chapter 9 (pages 220-221) presents students	3a CPO Science does not presume to stay current with media releases, journal excerts, or current research since all of our student texts are still available in print under copyright for 7-10 years. Under most state adoption rules, our resources may not be changed once "accepted". Given the plethora of online Science databases or research available at the touch of a button, we routinely recommend Internet searches in each chapter. In addition, there

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☐ Yes ☒ No	and courses.		with information connecting technologies that utilize simple machine and prosthetics. However, these lessons do not include data analysis, laboratory procedures, sample lab reports or impact analysis from advancement in technology. Students are introduced to forensic engineers in Unit 2, Chapter 6 (pages 156-157), but the content is not connected to the DCIs. The materials address the content; students rely on the textbook for information. Although short stories are presented at the beginning of each chapter and science facts and biographies are included throughout the chapters, (page 512 for example), textbook readings are the principle sources with which students interact. Pictures in the textbook are primarily drawn or illustrated. Students have limited opportunities to interact with real-world photographs.	is little supporting evidence that "photographs" in science texts contribute to any significant understanding of science phenomena. Rather, accurate scientific illustrations associated with complex processes, phenomena, and content are correlated with better achievement on standardized tests. Authentic sources that are up to date and vetted by science journals have been summarized in our Chapter Connections to make them easier for students to understand and written on so any LA HS student can read and understand them. Chapter 4 Connection: Animal Trackers does have real scientific data that students are expected to analyze and all of the Chapter Connections have been written with the intent of "connecting students to research" that might interest or engage them to find out more on a variety of topics, not just those a science publisher finds relevant.
	REQUIRED **3b)** Students regularly engage in **speaking and writing** about scientific phenomena and engineering solutions.	**No**	The instructional materials present students with few opportunities to speak and write about scientific phenomena or to engineer a solution. Writing prompts are centered on explanatory content, such as in Unit 3, Chapter 7, Section 7.1 (page 172), question 2. At times, students are asked to answer questions and write conclusions, but they are not prompted to share these conclusions with their peers. Investigations 23A (sections 6 and 7) and Investigation 6A (page 35) contain a curriculum component called “Arguing from Evidence.” However, the questions don’t require students to actually engage in arguments supported by evidence in writing or orally. A few items within the student edition and investigation manual require students to apply their knowledge across dimensions and express their ideas in writing. For example, Chapter 7, Section 7.2 (page 176), Question 3 and Unit 4, Chapter 13 (page 309), offer opportunities for students to apply their	3b The SE or IM not the only instructional material. Opportunites for group collaboration, discussion, and conclusions through oral and written responses are both provided and modeled throughout the TG lesson cycle and dialogs. Use of the TG highlights discussion opportunities throughout the lesson cycle and for both pre and post investigation discussion. Use of the Engineering Design Log has been fully explained. Students are challenged with five different assessment options for written response, from short answer to essay format questions within the Test Bank of the CPO Science version of Exam View.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
			knowledge. In Unit 6, Investigation 17A, students are able to develop a lab report to communicate their findings on conservation of mass during a chemical reaction.	
	3c) 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.	**No**	Few authentic science sources are present in the text for students to acquire vocabulary and scientific knowledge through reading or investigations. Each section in the student edition presents vocabulary in a vocabulary box to point out what students should look for in the text. Vocabulary is then italicized throughout the text. Unit 5, Chapter 14.2 (page 322) provides an example of this. On page 540, the words "electric motor" and "rotor" are bolded in the text; then the words are written and defined again separately in the margin of the same page. In some examples, "Cold Reads" introduce students to different disciplines. This is evident in Unit 5, Chapter 16, "The Spin on Scrap Tires," and in Unit 6, Chapter 18, "Your Footprint Matters." However, these articles do not develop a deeper understanding of the physical science standards and key vocabulary terms.	3c. This is erroneous. Again the reviewer refers to only the SE and not to the CPO lesson cycle. Please refer to TG lesson cycle in which the INVESTIGATION is performed first and the dialogs both introduce and connect vocabulary directly to student experiences, THEN students READ. Vocabulary boxes in the TG lesson cycle provide the needed definites for the teacher to introduce, connect, then remediate, review, PRIOR to assessment. Citing Unit 5, Ch14, please also reference: TG p299 Atom in the Family, by Laura Fermi, Boltzmann's Atom by David Lindley OLR Biographies of Ernest Rutherford and Niels Bohr in which there are other opportunities to read research from authentic sources. For vocabulary development, see TG p 300 14A dialog, p305 Lesson 14.1 , p307 14B dialog which all shows relevant vocabulary terms and origins introduced and reinforced during Inv. 14A, Lesson 14.1 an2d Inv 14B. This vocabulary is all accessed multiple times experientially PRIOR to Reading Lesson 14.2
	3d) Materials address the necessity of using **scientific evidence** to support scientific ideas.	**No**	The materials do not adequately require students to support scientific ideas with scientific evidence. When students are required to use evidence to support arguments, the instructional materials do not require them to use evidence from scientific or historical episodes in science and/or defend and critique claims using scientific reasoning. In Unit 4, Chapter 13 (page 303), the text utilizes a graph to support the comparison of altitude and air pressure. However, there is little use of graphs or other data for students to interpret throughout the rest of the text.	3d. Please refer to TG investigation dialogs provide how teachers aid students in discussing and drawing conclusions based on their evidence. Further, the reviewer limits the scope of our program to a few written prompts, intentionally designed for students to be brief and succinct for the purpose and ease of formative assessment, but missed the online resources and options for summative assessment.

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			Investigation 22A, Section 4 (pages 123-124), Investigation 6A asks students to answer questions and then asks "How is your answer supported by your observations?" However, although students use observations to support their ideas, the materials do not lead students to defend and/or critique claims using scientific reasoning.	
Non-Negotiable **4. LEARNING PROGRESSIONS:** Materials are coherent and provide natural connections to other performance expectations including science and engineering practices, crosscutting concepts, and disciplinary core ideas; the content compliment the major priorities of Louisiana Student Standards for Math. ☐ Yes ☒ No	**REQUIRED** **4a)** The overall organization of the materials and the development of content skills and practices are coherent and support student mastery of the standards. The **progression of learning** is coordinated over time, clear and organized to prevent student misunderstanding.	**No**	Within a unit of study, the DCIs are addressed in such a way that students can gradually build a depth of understanding. For example, Unit 7, Chapter 20 discusses charges, then circuits, then voltage, and finally resistance. This is a logical progression of the topics in an order that will lead to student understanding. It is also arranged in such a way that the students will be able to apply all of this knowledge as they learn about and build series and parallel circuits in Unit 7, Chapter 21. In Unit 2, the instructional materials address position and speed and velocity then graphs of motion and acceleration. However, the materials do not progressively build basic to complex ideas for the crosscutting concepts and science and engineering practices. Students are not presented with opportunities to plan and conduct experiments. Most of the investigations include step by step instructions. This is inconsistent with Asking Questions and Defining Problems practice in the Louisiana Student Standards for Physical Science. The curriculum also provides few instances where students have the opportunity to develop and revise their own models to explore a phenomenon and/or use evidence from the models to support scientific thinking, which is required by the Developing and Using Models practice of the Louisiana Student Standards for Physical Science.	4a. Again areas of our program are being reviewed isolation. Without implementation training, and the opportunity to step through a complete lesson, we can only emphasize the integrated use of the TG, equipment, and the Engineering Design Log with our SE and IM.
	4b) Materials are **coherent**, sequenced within and across units to build students' depth of knowledge.	**No**	Crosscutting concepts and science and engineering practices are not a focus in the materials and there are no true coherent connections between units to	4b The materials that best demonstrate how CPO Science meets the SEPs and CCCs were not reviewed completely or with the support of the complete

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
			allow for a deeper understanding of the physical science standards. The units are organized based on themes such as motion and forces, work and energy, matter and energy. This organization leads to some disconnect in the sequencing of the disciplinary core ideas between units. Nuclear chemistry is introduced in Unit 5, Chapter 14 (page 320) alongside atoms as radioactivity, but radioactive processes of fission and fusion are not discussed until Unit 6, Chapter 18 (page 422).	lesson cycle or use of equipment and physical experiences students do to achieve in these areas. That the reviewer feels disconnected is because a single lesson from start to finish was not reviewed, nor understood since the reviewer placed the SE as the central focus, not the teacher dialogs and equipment. We argue that the fission and fusion are not CHEMICAL reactions so need to be approached separately so as not to build misconceptions.
	4c) 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**	The text presents opportunities for students to utilize math skills from the high school grade band. In Unit 2, Chapter 6 (page 152), students are asked to use mathematical computations to solve the momentum of two hockey players, and they are asked to use the law of conservation of momentum to compute the speed that an astronaut moves backwards after throwing a wrench (page 153). However, the connections to the Louisiana Student Standards for Mathematics are not referenced in the materials. The teacher's edition (page 463) states that there will be mathematics connections dealing with Ohm's Law. However, it does not explicitly state the Louisiana Student Standards for Math that is connected to the performance expectation for HS-PS2-5.	
SECTION II: ADDITIONAL INDICATORS OF QUALITY				
Additional Criterion **5. 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	**REQUIRED** **5a)** There are separate **teacher support** materials including: scientific background knowledge, support in three-dimensional learning, learning progressions, common student misconceptions and suggestions to address them, guidance targeting speaking and writing in the science classroom (i.e. conversation guides, sample scripts, rubrics, exemplar student responses).	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	

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to build scientific thinking. ☐ Yes ☐ No	**5b)** 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.).	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	
Additional Criterion **6. 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** **6a)** Text sets (when applicable), laboratory, and other scientific materials are **readily accessible** through vendor packaging.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	
	6b) 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.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	
	6c) The total amount of content is **viable** for a school year.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	
Additional Criterion **7. 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** **7a) 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.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	
	7b) Scoring guidelines and rubrics **align** to performance expectations, and incorporate criteria that are specific, observable, and measurable.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	
FINAL EVALUATION ***Tier 1 ratings*** receive a "Yes" in Column 1 for Criteria 1 – 7. ***Tier 2 ratings*** receive a "Yes" in Column 1 for all non-negotiable criteria, but at least one "No" in Column 1 for the remaining criteria. ***Tier 3 ratings*** receive a "No" in Column 1 for at least one of the non-negotiable criteria.				
Compile the results for Sections I and II to make a final decision for the material under review.				

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
Section	**Criteria**	**Yes/No**	**Final Justification/Comments**	
I: Non-Negotiables	1. Alignment & Accuracy	**No**	The majority of the Louisiana physical science standards are not addressed in depth in the Student edition. Most of the standards are only partially addressed in the student edition focusing on the disciplinary core ideas and not the scientific and engineering practices or cross cutting ideas. Phenomena are rarely used to provide purpose for the lessons and to drive instruction in the student edition, teacher edition nor the investigation manual.	The SE alone does not represent "coverage of the standards" SEPs are not content based, but skills acquired through experiences. See references for the use of our Engineering Design Log post-investigation A, B, or C.
	2. Three-dimensional Learning	**No**	Three-dimensional learning is rarely integrated in the student edition. The cross cutting concepts are not explicitly addressed in the teacher's edition, student edition, or investigation manual. The science and engineering practices and disciplinary core ideas are presented together in the investigation manual; however, these investigations are separate from the text, not integrated.	Here the reviewer finally acknowledges the teacher edition (TG), but continues to view the student edition (SE) and investigation manual (IM) as a traditional textbook program. When the lesson cycle is implemented properly, TG dialogs and investigations drive instruction before students read or access the SE, our equipment, SE, IM, OLR are used as resources to aid students in understanding the focus of investigation of phenomena, not as isolated "pieces" of content.
	3. Disciplinary Literacy	**No**	There are few opportunities for students to engage in authentic sources. Most of the student edition provides a series of rote memory and predictable lessons of direct instruction, followed by prescribed lab investigations, more direct instruction, review, reteach, and assess. Students are rarely required to speak and write about scientific phenomena and engineering solutions.	TG scope and sequence presents at least 3 ELA references and numerous ways to engage students with both science and science literature and research. The program components are NOT intended to be used in isolation from the TG dialogs provided nor the full Lesson Cycle included for every SECTION of each Chapter of each program
	4. Learning Progressions	**No**	The student edition focuses on the disciplinary core ideas; therefore, there is little support for students to master the physical science standards. Although the math skills embedded within the student edition chapters is within the high school grade band, the teacher's edition does not mention which math standards are utilized.	See response 4c.
II: Additional Indicators of Quality	5. Scaffolding and Support	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	
	6. Usability	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
	7. Assessment	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	
FINAL DECISION FOR THIS MATERIAL: **Tier III, Not representing quality**				

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: **CPO Foundations of Physics, 2nd edition** Grade/Course: **Physics**

Publisher: **Delta Education, LLC** Copyright: **2016**

Overall Rating: **Tier III, Not representing quality**

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

STRONG	WEAK
	1. Alignment Accuracy (Non-Negotiable)
	2. Three-dimensional Learning (Non-Negotiable)
	3. Disciplinary Literacy (Non-Negotiable)
	4. Learning Progressions (Non-Negotiable)

To evaluate each set of submitted materials for alignment with the standards, begin by reviewing the indicators listed in Column 2 for the non-negotiable criteria. If there is a "Yes" for all required indicators in Column 2, then the materials receive a "Yes" in Column 1. If there is a "No" for any required indicator in Column 2, then the materials receive a "No" in Column 1.

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

Tier 1 ratings receive a "Yes" in Column 1 for Criteria 1 – 7.
Tier 2 ratings receive a "Yes" in Column 1 for all non-negotiable criteria, but at least one "No" in Column 1 for the remaining criteria.
Tier 3 ratings receive a "No" in Column 1 for at least one of the non-negotiable criteria.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
SECTION I: NON-NEGOTIABLE CRITERIA: Submissions must meet all of the non-negotiable criteria in order for the review to continue.				
Non-Negotiable **1. ALIGNMENT & ACCURACY:** Materials adequately address the Louisiana Student Standards for Science. Explaining phenomenon and designing solutions drive student learning. ☐ Yes ☒ No	**REQUIRED** **1a)** The majority of the Louisiana Student Standards for Science are incorporated, to the full **depth of the standards**.	**No**	Less than 10% of Louisiana Student Standards for Physics are fully addressed by the instructional materials. Most of the instructional materials address the disciplinary core ideas (DCIs). However, the science and engineering practices (SEPs) and crosscutting concepts (CCCs) are not fully addressed in the materials. Standard HS-PS2-1 is partially covered in Unit 2, Chapter 5, Section 2 (page 103). The unit covers the DCI of Newton's second law with formulas and examples. In Investigation 5.2 (pages 29-31), students analyze data. However, the CCC Cause and Effect is not explicitly addressed in the student edition nor the investigation manual. Unit 3, Chapter 8, Section 3 (page 175), and Unit 9, Chapter 30, Section 2 (page 54) partially covers standard HS-PS2-4. The book gives the formula for Newton's Law of Gravitation but does not fully address the DCI; it rarely references electrostatic forces and students have few opportunities to predict gravitational forces between objects. Standard HS-PS-2-4 is partially addressed in Unit 7, Chapter 21, Section 2. The DCI dealing with Electrostatic forces and Coulomb's law is addressed in the instructional resources. In Investigation 22.2 (pages 173-175), students investigate Coulomb's law. However, the CCC regarding patterns is not a focus in these sections.	Given the nature of LA ONLINE only submission process and our inability to converse efficiently in real time, we were not able to present our FULL program's depth and complexity, nor it's instructional design for commitee consideration. In previous years, in-person presentations to committees allowed us to more fully demonstrate how all of our program components form a learning system, not a traditional textbook program. Without such face to face demonstration, we could not adequately show how each of the components of either submittted programs dovetail to engage all students of various backgrounds and experiences to achieve the LA performance standards. Four additional components that extend this program beyond the required grade level background, knowledge, and skills needed students are: the CPO designed equipment, use of our investigation engineering design log, implementation training, and the use of the teacher's guide with 5-E lesson cycle with investigation master dialogs. The program can be both challenging to review and implement. The CPO program is also designed to advance teacher professional development from current lecture based instuction, or their tendency to teach to the top 10% of the students in their class. Given that this program is intended to both remediate and prepare students to advance through more Science courses, special attention is paid to bolstering experiential learning. Our learning systems apply a modified 5-E lesson cycle, through guided inquiry for a first investigation, then introduce simple options for advancing topics culminating in an engineering design log. The student edition's use of a "one main idea per page" approach allows teachers to select and use only the content needed by the individual

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
				student or entire class, to access it, and integrate it throughout the lesson cycle. How teachers do that is somewhat open ended given their prescribed class lengths, calendar constraints, student populations, and necessary individual student accomodations. It is apparent from the comments, the desired student performance objectives could appear to be missing or limited in scope, especially because the reviewer routinely only cites student text content, not the teacher guide dialogs, nor investigation sections in which the students learn experiencially PRIOR to using the student text. Delta Education and CPO Science do not believe instruction should be driven by a textbook, nor that NGSS science standards can be taught without doing real science. The response at the left is a traditional way to review "traditional textbook programs," which are not in line with research-based or NSTA instructional best practices, nor CPO Science's program implementation strategies. One of our learning systems' greatest strengths is how the student text, investigation manual, equipment versatility, and implementation training make it possible for teachers to customize almost any topic to any length and to a variety of learning environments or student needs. We will attempt to explain as best we can in complete detail below. Note: We have applied the following abbreviations for brevity and to reduce resource confusion. FP2: Foundations of Physics 2nd Ed. TG: Teacher Guide SE: Student Edition IM: Investigation Manual OLR: On-Line Resource 1a. It is stated at the left that "less than 10% of the Science standards are met upfront, yet the reviewer does not quantify how this conclusion can be drawn by reviewing only the SE and IM. The teacher investigation dialogs drive instruction, in which

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
				connections are routinely made through discussion and collaboration.
	REQUIRED **1b)** Observing and **explaining phenomenon** and **designing solutions** provide the purpose and opportunity for students to engage in learning.	**No**	Observing and explaining phenomena do not provide the purpose for learning. The instructional materials rarely use phenomena on the unit and lesson level to drive student learning. Unit 4, Chapter 10 (pages 218-219), describes how the Hoover Dam harvests the kinetic energy of the Colorado River and converts it into electricity. The reading provides students with examples of calculations and describes the amount of energy provided. However, the students are not expected to apply their scientific learning to explain this phenomenon and the phenomenon does not set the purpose for learning. In Investigation29.3 (page 242), students are asked to research nuclear energy, but students do not observe or explore a real-world phenomenon dealing with nuclear energy.	1b. The FP2 SE does not drive the CPO Science instructional sequence. Our TG connects every section of each the SE to a full lesson cycle. Chapter and Section choices can be customized by the teacher, given the scope of the local district's semester timeline, reporting period, student population, class period length, and classroom unique attributes or needs. The FP2 TG lessson cycle is focused on one structured investigation per section of each chapter for independent study or class collaboration. The use of the Engineering Design Log is introduced in implementati on training provided with the program. Observed phenomena are experienced, the discussed, then explained, and extensions are provided to elaborate and equipment is designed to make projects simple and easy to implement.
	REQUIRED **1c)** Science content is **accurate**, reflecting the most current and widely accepted explanations.	**Yes**	The science content is accurate and represents the most up-to-date knowledge.	We agree!
	1d) In any one grade or course, instructional materials spend minimal time on content outside of the course, grade, or grade-band.	**No**	The majority of the instructional materials include content that is outside of Louisiana Student Standards for Physics. Much of the content in Unit 2 addresses middle school disciplinary core ideas. Unit 2, Chapter 5.1: The First Law: Force and Inertia addresses MS.PS2A.a, MS.PS2A.b, MS.PS2A.c, and MS.PS2A.d, which is in the middle school grade band. The instructional materials are frequently aligned to the Louisiana Student Standards for Chemistry and Physical Science. For example, Unit 8, Chapter 27 addresses gas laws and buoyancy, which is aligned to the Louisiana Student Standards for Chemistry.	1d. Our Foundations of Physics Program is intended for any student who has completed Algebra I. It is not intended as use for in AP or Honors Physics or college credit. This introductory Physics program is to provide a FOUNDATION for any student needing HS Physics credit, but who may struggle with the associated reading, writing, or math skills at the 10th, 11th or 12th grade level. Students weak in math are routinely denied access to Physics courses, unless they have passed or achieved in previous science and math classes.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
			Unit 9, Chapter 30, Section 2 addresses standard HS-PS2-4, Newton's Law of Gravitation, which is aligned to the Louisiana Student Standards for Physical Science. Chapters 2-3 includes disciplinary core ideas aligned to the Louisiana Student Standards for Physical Science. Although most of the activities are below the high school grade band, there are a few instances where the activities are at the high school level. For example, Investigation 7.2 of Unit 3 (page 118), guides students to create a mathematical model for projectiles, which aligns to the SEP "Using Mathematics and Computational Thinking."	
Non-Negotiable **2. THREE-DIMENSIONAL LEARNING:** Students have multiple opportunities throughout each unit to develop an understanding and demonstrate application of the three dimensions. ☐ Yes ☒ No	**REQUIRED** **2a)** Materials teach the science and engineering practices, crosscutting concepts and disciplinary core ideas separately when necessary but they are most often integrated to support deeper learning. Assessment items and tasks are structured on integration of the **three-dimensions**.	**No**	Materials do not address the three dimensions consistently or in an integrated way. The CCCs are not adequately addressed in the student edition or investigation manual. While the DCIs are addressed on a surface level, the content requires students to do simple recall of the Ideas. Unit 4, Chapter 11 (page 227) uses the idea of natural systems and their efficiency to help students conceptualize the conversion of energy throughout natural systems as called for by the DCIs in standard HS-PS3-1. However, the lesson does not fully incorporate the SEP Using Mathematics and Computational Thinking. Unit 4, Chapter 12 (page 255) addresses angular momentum. The text builds on information covered from Chapter 9 of the text. Students explore the mathematical connection of angular momentum and conservation of energy; however, students are provided examples and no opportunity for exploration or student-centered investigation. In Unit 8, Chapters 25-27, the investigations are prescribed step-by-step investigations where students are told what and how to analyze their data. Students do not engage in the science and engineering practices that are appropriate for the	2a. The FP2 SE does not drive the CPO Science instructional sequence. Our TG connects every section of each the SE to a full lesson cycle. Chapter and Section choices can be customized by the teacher, given the scope of the local district's semester timeline, reporting period, student population, class period length, and classroom unique attributes or needs. The FP2 TG lessson cycle is focused on one structured investigation per section of each chapter for independent study or class collaboration and each investigation is accessed PRIOR to reading any section of the SE. The use of the Engineering Design Log is introduced in implementation training provided with the program.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
			high school grade band.	
	2b) 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, arguments and explanations of theory development, and conclusions from investigations.	**No**	There is little variety in the types of tasks students are required to execute throughout the instructional materials. Students are not asked to produce solutions to problems, develop models of phenomenon, compose arguments and explanations of theory development, or draw conclusions from student-designed investigations. Students are most often expected to answer content-based questions using the text or recall formulas to answer questions. The Unit 4, Chapter 12, Section 12.1 skills sheet asks students to apply mathematical skills that require basic recall level understanding of the formulas presented. In Investigation11.1, students explore the concept of efficiency and the loss of energy of a system through data collection on a track. However, students are provided a step-by-step procedure on how to carry out the investigation and details on how to analyze and interpret their data. Students have some opportunity to engage in different types of tasks such as analyzing collected data (Investigation 6.3), using a model (Investigation 28.2) and collecting and analyzing data from an investigation (Investigation 23.2). However, the majority of these tasks are not connected to real world phenomena and require students to recall content and/or follow prescribed "cookbook investigations."	2b. Without the access to the CPO Equipment such as the DataCollector, StandingWave Generator , Electric Motor, the reviewer can not see how it FIRST used instructionally for modeling real scientific phenomena nor how the use of the Engineering Design Log can extend each of these experiences beyond the step by step instructions required to initially operate the equipment. All of these pieces can be quickly re-oriented to allow students to change other variables to test their own predictions, challenge their assumptions and share what they learned. We refer to the Equipment Set Up videos so reviewers can see the equipment in action. The use of the instructional steps is to provide complete instructions for homebound, absent or isolated students to operate the equipment. In class, teachers are encouraged to have the equipment ready to save valuable class time, so students can jump to Part 2 of each investigation Section Skill sheets are formative assessments. The Exam View program allows access to our complete Test Bank providing three levels of assessment questions: Basic, Intermediate, and Advanced as well as multi-format questions such as short answer and essay. Teachers can access elp features to learn how to design their own math algorithms that enable them to assess different students at various math levels.
Non-Negotiable **3. DISCIPLINARY LITERACY:**	**REQUIRED *Indicator for grades 4-12 only** **3a)** Students have multiple opportunities to engage with	**No**	There are few opportunities for students to engage with authentic sources that represent the language and style of scientists and engineers. Students do	3a. Again, the integration of all the equipment and the investgiations driving instruction is not being considered. In Unit 4 Ch10, the Lesson is fully

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
Materials have students engage with authentic sources and incorporate speaking, reading, and writing to develop scientific literacy. ☐ Yes ☒ No	**authentic sources** that represent the language and style that is used and produced by scientists. Examples could include 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.		not interact with authentic sources for data analysis, interpretation, or to obtain, evaluate, and communicate information about scientific phenomena. Unit 4, Chapter 10 (page 209), presents the concept of work. One section of the resources has figures of people walking up stairs and an explanation of work being conducted, a crane lifting a steel beam. The materials do not compare the amount of work being done by the crane compared to that of the person walking up the stairs or encourage students to speak and write about the differences between the two examples. Unit 3, Chapter 8 (page 169) uses videos, but they are instructional in nature and do not require students to use the SEPs to make sense of them. When STEM connections are included at the end of the chapters, such as the story "Freak Waves" at the end of Unit 5, Chapter 14, and "The Large Hadron Collider" at the end of Unit 9, Chapter 30, these stories are anecdotes that tie into the lesson that has just been taught; they do not require students to engage in speaking and writing about the science behind the story.	dialoged on beginning with mechanical advantage using pulleys on TG p166 and TG p173 which advances the understanding of work though investigation of energy.
	REQUIRED **3b)** Students regularly engage in **speaking and writing** about scientific phenomena and engineering solutions.	**No**	The instructional materials present students with few opportunities to speak and write about scientific phenomena or to engineer a solution. Most writing opportunities focus on the DCIs and are not connected to real world phenomena. For example, Unit 4, Chapter 11 (page 242) requires students to prepare a report and complete research about natural cycles and solar cells. In Unit 8, Chapter 25, page 542, Apply Your Knowledge section, students are asked to explain and conduct research on the specific heat of hydrogen. In Unit 1, Chapter 4, page 98, Apply Your Knowledge section, students are asked to "Describe how absence of air resistance will affect people on Earth?" In these	3b. The SE or IM are resources, not the only instructional materials provided for review. Opportunites for group collaboration, discussion, and conclusions through both oral and written responses are both provided and modeled throughout the TG lesson cycle, a wide variety of supplied OLR and Assessments.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
			three examples, the writing is centered on students explaining disciplinary core ideas instead of real world phenomena. At the conclusions of investigations, students rarely communicate and/or engage in arguments with their peers. Investigation 28.1, page 229, "Compare the Size of a Nucleus to the Entire Atom" asks students to, "Write a paragraph of how this activity is like the gold foil experiment." Investigation 22.3, Arguing From Evidence, Question A (page 185), requires students to respond to this prompt, "The bodies of automobiles are made of magnetic steel, yet you can buy a compass for your car. Some cars even have electronic compasses build in. Based on your observations, would your trust directions from a compass inside a car?" In both examples, the materials do not prompt students to discuss their responses with their peers, instead students write simple explanations based on information learned from the student edition or measurements taken in the investigation.	
	3c) 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.	**No**	Few authentic science sources are present in the text for students to acquire vocabulary and scientific knowledge through reading or investigations. Most vocabulary is presented at the opening of the chapter, such as the vocabulary words listed on page 499. Vocabulary words are reviewed at the conclusion of the chapter in the chapter assessment. Unit 7, Chapter 24 (page 516); Unit 5, Chapter 14.2 (page 322); and Unit 3, Chapter 7 (page 162) are examples of how vocabulary is addressed in isolation at the conclusion of a chapter.	3c. This is erroneous. Again the reviewer refers to only the SE and not to the CPO lesson cycle in the TG. Please refer to Unit 7, Ch24 TG Inv 24.1 investigation dialog p538, Lesson 24.1 cycle p442 vocabulary, in which the INVESTIGATION is performed FIRST and the dialogs both introduce and connect vocabulary to experiences, THEN READ the SE. Vocabulary boxes in the TG lesson cycle provide the needed definites for the teacher to introduce, connect, then remediate, review, PRIOR to reading or any assessment.
	3d) Materials address the necessity of using **scientific evidence** to support scientific ideas.	**No**	The materials do not adequately require students to support scientific ideas with scientific evidence. When students are required to use evidence to support arguments, the instructional materials do not require them to use evidence from scientific or historical episodes in science and/or defend and critique claims using scientific reasoning.	3d. Please refer to TG dialogs for each investigation portion. The reviewer neglected to show how other investigations earlier in the program completely addresses independent analysis of graphs and the OLR Problem sets that apply

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			The instructional materials rarely require or encourage students to support their ideas with evidence when answering questions in the text. For example, when graphs are used in Unit 4, Chapter 13 (page 303) and Unit 1, Chapter 3 (page 66) the text explains the graphs. Students do not independently analyze and interpret the graphs and/or use the graphs to support scientific thinking and ideas. Students are not consistently encouraged to use evidence from investigations to support their ideas and conclusions. In Investigation 18.2: Interference, Diffraction, and Polarization (page 145), Question A states "Describe the motion of the spring using the terms horizontal polarization and vertical polarization." Students are not required to use evidence from the investigation to support their response or scientific idea. Instead, students use information from the student manual to respond to the question.	
Non-Negotiable **4. LEARNING PROGRESSIONS:** Materials are coherent and provide natural connections to other performance expectations including science and engineering practices, crosscutting concepts, and disciplinary core ideas; the content compliment the major priorities of Louisiana Student Standards for Math. ☐ Yes ☒ No	**REQUIRED** **4a)** The overall organization of the materials and the development of content skills and practices are coherent and support student mastery of the standards. The **progression of learning** is coordinated over time, clear and organized to prevent student misunderstanding.	**No**	Within a unit of study the DCIs are addressed in such a way that students can gradually build a depth of understanding. Simple ideas are introduced first and the instructional materials gradually build up to more complex ideas. Unit 5, Chapter 14 introduces the properties of waves, measurements of speed, frequency, wavelength, and amplitude. This allows a logical progression to applying those values to different types of waves such as sound (Chapter 15) and light (Chapter 16). However, the lack of integration of the SEPs and CCCs in the curriculum do not allow students to progressively build basic to complex ideas of content skills and practices. Investigations often require students to follow instructions to build a model to explore science content and do not require students to revise their own models. In Investigation 28.2	4a. The purpose of the step-by-step directions in our investigation manual is to allow alternative education, homebound, remote, special education, or students absent from class to be able to proceed through all of the required steps needed to set up and complete an investigation on their own. CPO implementation training provides teachers with the equipment setup videos and investigation dialogs that encourages teachers to have equipment assemebled prior to investigation. This allows efficienty use of time when students arrive in class to quickly proceed, without the "prescipted" instructional steps. See OLR Equipment set up videos. TG dialogs provide the both the instructional sequence, wait time, and guided discussions for opportunities to advance investigations beyond rote learning.

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
			(page 233), students are given directions to build a model and use their models to play a game to explore electrons and quantum states. However, students do not revise or use their models to explain phenomenon. The instructional materials also prescribe the steps that students should follow when completing investigations. For example, Investigation 17.2: Mirrors, Lenses, and Images; Investigation 8.1: Motion in Circles; and, Investigation 29.1: Radioactivity provide students with detailed step by step instructions on how to carry out the investigation. In all of these examples, students do plan and conduct an investigation individually or collaboratively as called for by LSSS.	
	4b) Materials are **coherent**, sequenced within and across units to build students' depth of knowledge.	**No**	Due to the lack of integration of the SEPs and CCCs, the materials are not coherent within and across units to build students depth of understanding. The teacher's edition lists the CCCs, but they are not used to help students connect their learning within or between units.	4b Please refer to the TG lesson cycle for each section of each chapter and the use of experiential learning using equipment designed to aid students in learning by doing..
	4c) 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**	The text presents opportunities for students to utilize math skills from the high school grade band. Standard A1, A-CED.A.4 is addressed in Unit 2, Chapter 5.2 (pages 103-105). In this unit, students are asked to rearrange the formula for acceleration in order to solve for force and then mass of object. However, the connections to the Louisiana Student Standards for Mathematics are not referenced in the materials. Standard, A1, F-IF.C.7 is addressed in Investigation 5.2, Section 4, but the Louisiana Student Standards for Math are not explicitly referenced. Students graph acceleration, force data, and determine the slope and y-intercept. Students are then asked to determine how the two variables are related which coincides with math standard A1, S-D.B.6, but the standard is not referenced in the materials.	4c. To elaborate, our Foundations of Physics Program is intended for any student who has completed Algebra I. It is not intended as use for in AP or Honors Physics or college credit. This introductory Physics program is to provide a FOUNDATION for any student needing HS Physics credit, but who may struggle with the associated reading, writing, or math skills at the 10th, 11th or 12th grade level. Students are routinely denied access to take Physics courses, unless they have passed or achieved in previous science classes. CPO Science believes that all students should take experiential physics courses to remove the pervasive, but incorrect assumption that you must have high math skills to be able to understand Physics. That Physics continues to be offered only to seniors or elite students is a prevalent, enduring misconception and curriculum philosophy that CPO Science was designed to dispel and fight. If correlations to specific grade level LA Standards

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				for Mathematics are required for Tier III approval, we would request more time to consider or complete this task.
SECTION II: ADDITIONAL INDICATORS OF QUALITY				
Additional Criterion **5. 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** **5a)** There are separate **teacher support** materials including: scientific background knowledge, support in three-dimensional learning, learning progressions, common student misconceptions and suggestions to address them, guidance targeting speaking and writing in the science classroom (i.e. conversation guides, sample scripts, rubrics, exemplar student responses).	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	
	5b) 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.).	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	
Additional Criterion **6. 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** **6a)** Text sets (when applicable), laboratory, and other scientific materials are **readily accessible** through vendor packaging.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	
	6b) 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.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	
	6c) The total amount of content is **viable** for a school year.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	

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Additional Criterion **7. 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** **7a) 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.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	
	7b) Scoring guidelines and rubrics **align** to performance expectations, and incorporate criteria that are specific, observable, and measurable.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	

FINAL EVALUATION
Tier 1 ratings receive a “Yes” in Column 1 for Criteria 1 – 7.
Tier 2 ratings receive a “Yes” in Column 1 for all non-negotiable criteria, but at least one “No” in Column 1 for the remaining criteria.
Tier 3 ratings receive a “No” in Column 1 for at least one of the non-negotiable criteria.

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

Section	Criteria	Yes/No	Final Justification/Comments	
I: Non-Negotiables	1. Alignment & Accuracy	**No**	The student edition in conjunction with the investigation manually partially covers most of the standards. Phenomena are rarely used to provide purpose for the lessons and to drive instruction.	This is a not a correct interpretation of our learning system. Per our scope and sequence for each chapter and the recommended lesson cycle, which is provided for EVERY section of the student text, the scientific phenomena, activities, and investigations drive all scientific classroom discussion and inquiry.
	2. Three-dimensional Learning	**No**	Three-dimensional learning is rarely integrated in the student edition. Students are provided little opportunity throughout the introduction of new concepts or through the deepening of concepts to engage in the three dimensions of learning that are important for ensuring students develop a rich and detailed understanding of concepts discussed. There is very little variety in the types of tasks students are required to execute throughout the student edition	See notes above regarding the evaluation of only the SE vs. our complete integrated program and TG.
	3. Disciplinary Literacy	**No**	There are few authentic sources (such as journal excerpts, media releases, real photographs, and sections of lab reports) for students to use for three-	CPO Science does not presume to stay current with media releases, journal excerts, or current research since all of our student texts are still available in

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES	PUBLISHER RESPONSE
			dimensional learning in either the student edition or investigation manual. There are few opportunities for students to speak and write about scientific phenomena or engineering solutions in the student edition or investigation manual.	print under copyright for 7-10 years. Under most state adoption rules, the resources may not be changed during that time. Given the plethora of online sources available at the touch of a button, we routinely recommend Internet research or "search terms" in each chapter. In addition, there is little supporting evidence that "photographs" in science texts contribute to any significant understanding of science phenomena. Rather, accurate scientific illustrations associated with complex processes, phenomena, and content are correlated with better achievement on standardized tests.
	4. Learning Progressions	**No**	The Disciplinary core ideas are addressed in such a way that the students can build up to more complex ideas. Crosscutting concepts are not explicitly a focus throughout the student edition or investigation manual; therefore, there is no progression of learning for crosscutting concepts. The student edition does not focus on science and engineering practices, so again there is no progression of learning in this area.	Again, the reviewer focused on the SE only and not the true progression of learning taking place through investigation, skills acquisition, as students approach application of their understanding through collaboration, independent and group projects, or as they use the Engineering Design Log found in IM p251-260 and assessment rubric on p261.
II: Additional Indicators of Quality	5. Scaffolding and Support	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	
	6. Usability	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	
	7. Assessment	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.	
FINAL DECISION FOR THIS MATERIAL: **Tier III, Not representing quality**				

Appendix II.

Public Comments

There were no public comments submitted.