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: **Active Physics Third Edition**

Grade/Course: **Active Physics**

Publisher: **SASC, LLC dba Activate Learning**

Copyright: **2016**

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

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

STRONG	WEAK
	1. Three-dimensional Learning (Non-negotiable)
	2. Phenomenon-Based Instruction (Non-negotiable)

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

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

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

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

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

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

CRITERIA	INDICATORS OF SUPERIOR QUALITY	MEETS METRICS (YES/NO)	JUSTIFICATION/COMMENTS WITH EXAMPLES
Section I: Non-negotiable Criteria of Superior Quality **Materials must meet Non-negotiable Criteria 1 and 2 for the review to continue to Non-negotiable Criteria 3 and 4. Materials must meet all of the Non-negotiable Criteria 1-4 in order for the review to continue to Section II.**			
Non-negotiable **1. THREE-DIMENSIONAL LEARNING:** Students have multiple opportunities throughout each unit to develop an understanding and demonstrate application of the three dimensions. ☐ Yes ☒ No	**Required** **1a)** Materials are designed so that students develop scientific content knowledge and scientific skills through interacting with the three dimensions of the science standards. The majority of the materials teach the science and engineering practices, crosscutting concepts and disciplinary core ideas separately when necessary but they are most often integrated to support deeper learning.	**No**	The instructional materials are not designed so that students develop scientific content knowledge and scientific skills through interacting with the three dimensions of the science standards. Most of the materials are teacher directed. The majority of materials do not integrate the Science and Engineering Practices (SEP), Crosscutting Concepts (CCC), and Disciplinary Core Ideas (DCI) to support deeper learning. For example, in Chapter 1, Driving the Roads, the Chapter Challenge introduces students to the "Engineering Cycle," but fails to align with the Science and Engineering Practices (SEPs), and does not align to any of the Louisiana Student Standards for Science (LSSS) for Physics, according to the Active Physics Alignment to the LSSS, Physics document. The purpose of this "launcher Chapter" is to get students to become familiar with the book features. The lesson begins with an investigation (SEP, Planning and Carrying out Investigations) of measuring reaction time, but does not

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			incorporate any DCIs or CCCs. By the end of the Chapter, the students create a presentation and written report to demonstrate that they understand the Physics of Driving; however, the activity does not incorporate any of the DCIs. In Chapter 2, Section 6, students engage in a teacher-led lab activity. The materials suggest that the teacher leads the demonstration of pushing against a wall while on a skateboard. Students then answer questions from the book. DCI HS.PS2A.a is somewhat present as students read and answer the questions about mass and acceleration, but the focus of the chapter is Newton's 3rd Law as opposed to Newton's 2nd law outlined in the DCI. In addition, the SEP Using Mathematical and Computational Thinking to describe and support claims/explanations is absent from the lesson. The students are asked to do "thought experiments" but do not gather data to support these claims. Chapter 3, Section 1 is centered around reading for information and answering questions about automobile safety features. In Section 2, students use a clay model and small cart to make observations of

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			various crashes with and without seatbelts. While this incorporates Using and Developing Models and demonstrates the Cause and Effect (CCC) of wearing and not wearing a seatbelt, as well as changing the ramp and increasing the speed of the cart, no DCI is incorporated. In Chapter 3, Section 5, the "Essential Questions of Physics," section explains how the 3 dimensions are integrated within the chapter thus far. DCI HS.PS2A.b of Forces and Motions is used and explored in the answer, and then the CCC of Systems and System Models is mentioned, but not addressed by the student. In addition, the SEP of Using Mathematics and Computational Thinking is not utilized by the students. The formula is provided and an example is given, but the students do not engage with the SEP. Chapters 3 and 4 show motion in two dimensions. In Chapter 3, motion is not addressed quantitatively, and in Chapter four a totally different activity is introduced to show quantitative measurement of two dimensional motion. Students are asked to obtain and communicate information (SEP, Obtaining, Evaluating, and

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			Communicating Information) but neglects CCC or DCI. The activity and lesson are teacher driven as opposed to students developing the content through exploration and discovery. In Chapter 9, Sports on the Moon, the Chapter Challenge asks students to use the Engineering Cycle to explain a sport that can be played on the moon and what modifications must be made to the game in order to be played under these different conditions. Although there is some evidence of three dimensional learning as students apply concepts learned throughout the chapter to invent or adapt a sport to play on the moon, this 3D approach was not as evident throughout the chapter.
Non-negotiable **2. PHENOMENON-BASED INSTRUCTION:** Explaining phenomenon and designing solutions drive student learning. ☐ Yes ☒ No	**Required** **2a)** Observing and explaining phenomena and designing solutions provide the purpose and opportunity for students to engage in learning a majority of the time.	**No**	Observing and explaining phenomena and designing solutions does not provide the purpose and opportunity for students to engage in learning a majority of the time. Each chapter includes a Chapter Challenge that students will complete by the end of the chapter. During the introduction of the Chapter Challenge, students do not have the opportunity to observe and ask questions and define problems that will lead them to an

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			explanation or solution to the challenge. The lessons that follow provide the content necessary to complete the challenge, but are teacher directed. Each section begins with a "What Do You See?" section that includes a preview cartoon intended to "preview all of the physics concepts the chapter will present," followed by a "What Do You Think" section where students answer questions about the picture. This section acts as a hook rather than a phenomenon. There is a foundational idea for each chapter, for example, Driving the Roads, Thrills and Chills, Toys for Understanding. However, these ideas are used more as familiar lesson and chapter "hooks" rather than new and unknown phenomena that students use throughout the lesson to drive instruction, questioning, and investigation. For example, in Chapter 9, Sports on the Moon, students are introduced to the Chapter Challenge to "identify, adapt, or invent a sport that people on the moon will find interesting, exciting, and entertaining." Students then generate their own list of what they will have to do in order to receive a grade of A for the challenge. The teacher then goes

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			over the Engineering Design Cycle that will be used during the Chapter Challenge. The materials suggest that teachers could ask students whether an object would encounter friction on the Moon, whether there is any resistance, or whether momentum would be conserved. This if followed by the teacher showing 8 videos of people engaged in various activities, half of which should be sports and the other half should not. Only three video links are provided for the teacher, and the materials suggest that the teacher go to YouTube and find unusual and uncommon sports. No other directions are given for the "non-sport" videos. Students then have to decide which of the videos are sports and which are not. Students are not provided the opportunity to ask questions or define a problem pertaining to the Chapter Challenge. Following the introduction, in Section 1, students are instructed to discuss sports, how they define sports, what they know about sports, etc. Students then brainstorm a list of at least 10 words or phrases that identify attributes of sports. Describing sports does not provide the purpose and

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			opportunity for students to engage in learning. Each section thereafter begins with students looking at a picture and answering questions within the "What Do You See?" and "What Do You Think?" sections. These pictures do not serve as investigative phenomenon, but an introduction to what they will learn within the section. For example, in Section 2, students observe a drawing of two astronauts on the moon (one is jumping off of a ladder and the other is whistling) and discuss what is happening in the picture, while the teacher asks questions. Students do not have the opportunity to ask questions and provide explanations, and the investigations that follow are teacher directed. In Chapter 6, Electricity for Everyone, students are tasked with developing an appliance package that would help meet the basic needs for families who live in different parts of the world. The source of energy will be a wind generator. Students are then given information about a wind generator system. The tasks of the challenge include, "Decide on electrical appliances to meet basic needs, Construct a training manual describing how to train

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			people to stay within power and energy limits of the electrical system," and then create a "Wiring diagram showing the distribution of electricity." Students are then told that they will use their experience with electricity and what they learn in this chapter to complete the challenge. The sections that follow include teacher questioning and teacher led investigations that help students learn the content needed to complete the challenge. Throughout the sections, students are not presented with investigative phenomenon in which they are able to observe and ask questions about, design solutions for, or develop explanations for. Although they are presented a Chapter Challenge at the start of the chapter, the challenge does not provide purpose and opportunity for students as the rest of the chapter is teacher directed.
Non-negotiable (only reviewed if Criteria 1 and 2 are met) **3. ALIGNMENT & ACCURACY:** Materials adequately address the Louisiana Student Standards for Science.	**Required** **3a)** The majority of the Louisiana Student Standards for Science are incorporated, to the full **depth of the standards**.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	Required **3b)** Science content is **accurate**, reflecting the most current and widely accepted explanations.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.

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☐ Yes ☐ No	**3c)** In any one grade or course, instructional materials spend minimal time on content outside of the course, grade, or grade-band.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
Non-negotiable (only reviewed if Criteria 1 and 2 are met) **4. DISCIPLINARY LITERACY:** Materials have students engage with authentic sources and incorporate speaking, reading, and writing to develop scientific literacy. ☐ Yes ☐ No	**Required *Indicator for grades 4-12 only** **4a)** Students regularly engage with **authentic sources** that represent the language and style that is used and produced by scientists; e.g., journal excerpts, authentic data, photographs, sections of lab reports, and media releases of current science research. Frequency of engagement with authentic sources should increase in higher grade levels and courses.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	Required **4b)** Students regularly engage in **speaking and writing** about scientific phenomena and engineering solutions using authentic science sources; e.g., authentic data, models, lab investigations, or journal excerpts. Materials address the necessity of using **scientific evidence** to support scientific ideas.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	Required **4c)** There is **variability** in the tasks that students are required to execute. For example, students are asked to produce solutions to problems, models of phenomena, explanations of theory development, and conclusions from investigations.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	4d) Materials provide a coherent sequence of authentic science sources that build scientific **vocabulary** and knowledge over the course of study. Vocabulary is addressed as needed in the materials but not taught in isolation of deeper scientific learning.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.

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Section II: Additional Criteria of Superior Quality			
5. LEARNING PROGRESSIONS: The materials adequately address Appendix A: Learning Progressions. They are coherent and provide natural connections to other performance expectations including science and engineering practices, crosscutting concepts, and disciplinary core ideas; the content complements the the Louisiana Student Standards for Math. ☐ Yes ☐ No	**Required** **5a)** The overall organization of the materials and the development of disciplinary core ideas, science and engineering practices, and crosscutting concepts are coherent within and across units. The **progression of learning** is coordinated over time, clear and organized to prevent student misunderstanding and supports student mastery of the performance expectations.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	5b) Students apply mathematical thinking when applicable. They are not introduced to math skills that are beyond the applicable grade's expectations in the Louisiana Student Standards for Mathematics. Preferably, **math connections** are made explicit through clear references to the math standards, specifically in teacher materials.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
6. SCAFFOLDING AND SUPPORT: Materials provide teachers with guidance to build their own knowledge and to give all students extensive opportunities and support to explore key concepts using multiple, varied experiences to build scientific thinking. ☐ Yes ☐ No	**Required** **6a)** There are separate **teacher support** materials including: scientific background knowledge, support in three-dimensional learning, learning progressions, common student misconceptions and suggestions to address them, guidance targeting speaking and writing in the science classroom (e.g. conversation guides, sample scripts, rubrics, exemplar student responses).	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	6b) Appropriate suggestions and materials are provided for **differentiated instruction** supporting varying student needs at the unit and lesson level (e.g., alternative teaching approaches, pacing, instructional delivery options, suggestions for addressing common student difficulties to meet standards, etc.).	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.

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7. USABILITY: Materials are easily accessible, promote safety in the science classroom, and are viable for implementation given the length of a school year. ☐ Yes ☐ No	**Required** **7a)** Text sets (when applicable), laboratory, and other scientific materials are **readily accessible** through vendor packaging.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	Required **7b)** Materials help students build an understanding of standard operating procedures in a science laboratory and include **safety** guidelines, procedures, and equipment. Science classroom and laboratory safety guidelines are embedded in the curriculum.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	7c) 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.
8. ASSESSMENT: Materials offer assessment opportunities that genuinely measure progress and elicit direct, observable evidence of the degree to which students can independently demonstrate the assessed standards. ☐ Yes ☐ No	**Required** **8a) Multiple types** of formative and summative assessments (performance-based tasks, questions, research, investigations, and projects) are embedded into content materials and assess the learning targets.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	Required **8b)** Assessment items and tasks are structured on integration of the **three-dimensions**.	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	8c) 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" for all Non-negotiable Criteria and a "Yes" for each of the Additional Criteria of Superior Quality.
Tier 2 ratings receive a "Yes" for all Non-negotiable Criteria, but at least one "No" for the Additional Criteria of Superior Quality.
Tier 3 ratings receive a "No" for at least one of the Non-negotiable Criteria.

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

Section	Criteria	Yes/No	Final Justification/Comments
	1. Three-dimensional Learning	**No**	The instructional materials are not designed so that students develop scientific content knowledge and

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			scientific skills through interacting with the three dimensions of the science standards. Most of the materials are teacher directed. The majority of materials do not integrate the Science and Engineering Practices (SEP), Crosscutting Concepts (CCC), and Disciplinary Core Ideas (DCI) to support deeper learning.
I: Non-negotiable Criteria of Superior Quality[2]	2. Phenomenon-Based Instruction	**No**	Observing and explaining phenomena and designing solutions does not provide the purpose and opportunity for students to engage in learning a majority of the time. There is a foundational idea for each chapter, however, these are used more as familiar lesson and chapter "hooks" rather than new and unknown phenomena that students use throughout the lesson to drive instruction, questioning, and investigation. It is a known or common anchor used to introduce the lesson, rather than an uncommon anchor that the students must explore to explain through scientific content.
	3. Alignment & Accuracy	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	4. Disciplinary Literacy	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
II: Additional Criteria of Superior Quality[3]	5. Learning Progressions	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.

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

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	6. Scaffolding and Support	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	7. Usability	**Not Evaluated**	This section was not evaluated because the non-negotiable criteria were not met.
	8. 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**			

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

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

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

The 2019-2020 Teacher Leader Advisors are selected from across the state and represent the following parishes and school systems: Ascension, Beauregard, Bossier, Caddo, Calcasieu, Caldwell, City of Monroe, Desoto, East Baton Rouge, Einstein Charter Schools, Iberia, Jefferson, Jefferson Davis, KIPP New Orleans, Lafayette, Lafourche, Lincoln, Livingston, LSU Lab School, Orleans, Orleans/Lusher Charter School, Ouachita, Plaquemines, Pointe Coupee, Rapides, Richland, RSD Choice Foundation, St. John the Baptist, St. Charles, St. James, St. Landry, St. Mary, St. Tammany, Tangipahoa, Vermillion, Vernon, West Baton Rouge, West Feliciana, and Zachary. This review represents the work of current classroom teachers with experience in grades 9-12.

Appendix I.

Publisher Response

The publisher had no response.

Appendix II.

Public Comments

There were no public comments submitted.