Evaluator: 61 Grade Level: 5 Program: AmplifyScience

Washoe County School District K-5 Science
2020 Instructional Materials Evaluation Rubric
(Certified Teaching Professional Form)

Category 1: Designed for Three-Dimensional Learning

Criterion 1A: Phenomena and Problems

Instructional materials focus on students making sense of phenomena or designing solutions to problems which drives student learning.

- Students are engaged with phenomena or problems that can be explained or solved through the application of the three-dimensions.
- A good phenomenon builds on everyday student experiences and targets grade appropriate learning goals.
- Anchoring, investigative and everyday phenomena may be present.
- Engineering lessons require students to use elements of the science core ideas together with elements of core ideas from engineering design to solve problems.

Less of this:	**More** of this:
Phenomena are just for the initial hook.	Phenomena drives the learning.
Phenomena are fun or flashy to engage students.	Phenomena that builds on everyday experiences supports engagement.
Phenomena are brought in after students develop the science ideas so they can apply what they learned.	The development of science ideas is anchored in investigations of phenomena.
Engineering problems are unrelated to the science learning.	Engineering involves designing solutions to problems that arise from phenomena.

Specific Evidence from Materials
The Unit overview begins with a Unit Question and the chapters and lessons accompanying that Unit also begin with related questions. However a guiding question is not necessarily a phenomenon. The lesson preassessment does provide the teacher with a phenomenon (we see stars at different times) and then explains students will write an explanation as to why. The lesson starts with the guiding questions and tries to place the question in a real world scenario the students may find themselves in, providing context for the science. The phenom starts is introduced to students through PowerPoint type slides of cultural artifacts helping to provide cultural purpose into the science. PES Page 36: Why don't we see a lot of stars during the day time? Investigation Questions: Where are the stars in space? If the stars are all around us, why can't we always see them? – These guiding questions are returned to throughout the unit in depth and build with additional questions at each lesson/activity point.

PES Page 40: Unit Anchoring Phenom: Different stars are visible in the sky at different times; chapter level phenom: In the daytime, the sun is visible in the sky but other starts are not. – Although the phenomenon is introduced in the teacher guide, the focus of the student interactions are on the guiding questions more so than the phenom. Although the phenom is introduced to guide students into their questions and investigations through slides and images.

PES Page 59 – students are presented with a problem to solve. The problem integrates culture and science into the need to solve the problem (engineering). This is a good example of using engineering to develop a DCI, and also the connection between science and culture.

PES Page 70 (1.2): Anchor: (Above) Chapter lever: (Above) Investigative: Sometimes stars are visible in the sky sometimes only the sun is visible.

PES 119: Anchor, Chapter, and Investigative as well as Inv. Question are presented " Where are the stars in space" – these are referred to throughout the lesson activities.

PES 186: Anchor, Chapter phenomenon – same as previous, loops to it again and integrates what students will learn at this point in the chapter

PES page 203 – Students share ideas about the artifact – this is the answer to the problem (or the explanation developed throughout this unit) for this unit.\

PES page 246 Understanding why we see the sun and other stars in the same pattern every day might help you work out what the missing piece of the artifact looked like, so the museum can restore it. - Students return to the phenom, and question for the unit and add in additional data to support their understanding and add to their claims/models. so far

To what extent do the materials support Criterion 1A? Include your reasoning.
The units provide nested, structured anchor and investigative phenomena throughout. Guiding questions are provided within each step of the UCLA structure to focus students and provide

depth at each level. Students continually return to the anchor and investigative phenomena throughout the unit adding to their understanding with each activity. The context for the units also provides a real world scenario for students to dig into, allowing the home/real world science deficit idea to break down and for students to see the connection of science in a real way. The inclusion of cultural pieces embedded throughout also address the NOS well. The continuous cycling of Anchor phenom, inves. Phenom, investigation, sense making, investigative phenomenon… allows students to use the crosscutting concepts regularly (although not always explicitly stated) to understand the science and use it in a real way.

Criterion 1B: Integrating the Three-Dimensions

Instructional materials integrate elements of the Science and Engineering Practices, Crosscutting Concepts and Disciplinary Core Ideas.

- Students develop and use multiple grade-appropriate elements of each dimension.
- The dimensions are integrated to work together and are not taught in isolation.
- Learning experiences integrate multiple different pairings of the dimensions to build understanding of the targeted performance expectations.
- Engineering is integrated with at least once per domain of science.

Less of this:	**More** of this:
Students only engage in a single practice element in a lesson.	The lesson helps students use and develop multiple practice elements.
Lessons teach the dimensions separately or only address them at the general level.	Lessons integrate grade-appropriate elements for each dimension.
Engineering lessons focus on trial and error activities that don't require science or engineering knowledge.	Grade-appropriate elements of engineering design and science core ideas are integrated with the other dimensions.
Engineering consists of challenges or step-by-step directions to build something.	Engineering is integrated into the grade-appropriate science core ideas and use explanations of phenomena to design solutions.

Specific Evidence from Materials
The elements of the grade standards do not seem to always be grade level. For example. Students are asked to develop models (patterns in the sky 1.2) the model is simply a drawing – however 5th grade elements require inputs/outputs and explanations. The investigations focus on content (DCI) with language heavy requirements for writing and reading much of the time. The student activities are focused on collecting content rather than using the SEPs or CCCs. The student worksheets tend to be DCI and language heavy. Lesson 1.6 Patterns in the sky is just a fill in the blank with a word bank. PES page 79: Hold up the globe and an unfolded map, explain that these are two models of the earth – these are not representative of grade level models. This is in the k-2 grade band for a model. PES page 86 students discuss how the simulation is a model of earth (students use the models but don't develop their own) PES page 135: CCC called out during simulation – Systems and system models students use their knowledge of this CCC to help understand how the star systems are related or different and how the parts interact.

PES page 200 Writing scientific explanations – the instructional guide goes through a set of directions for writing explanations and students follow through writing an explanation from their readings, investigations, and artifacts. This relates directly back to the guiding questions and problem for this unit.

PES page 223, briefly discuss students' heads as a model for Earth "Models can be extremely helpful for scientists so they can explore their ideas about things that are too big, small, or difficult – this idea of a model is in the k-2 grade band.

PES page 247, what are some things scientists need to think about carefully as they plan their investigations "What will you observe and record" "What will be the same each time"… - students are planning their investigation to collect additional information – planning and carrying out investigations. Students then use the simulation and execute their investigation. Students' data could be different as a result of how their investigation was planned (the day they started collect data on in the investigation)

PES page 282 – Student App page, Modeling tool, show use software to aid in their understanding of the earth and why you can't see everything from earth at the same time – at this point students are required to use their understanding of the app for modeling, the physical model they explored, and various other information to begin developing a claim about why you can't see stars from different times in the day

To what extent do the materials support Criterion 1B? Include your reasoning.
Click or tap here to enter text.

Criterion 1C: Coherence

Instructional materials help students develop increasingly sophisticated understandings within and across grade-levels.

- Lessons fit together to target a set of performance expectations with multiple opportunities for students to revise understandings over time.
- Instructional materials make connections between lessons, units and grade levels.
- Lessons build on students' prior learning in all three dimensions.
- Students engage in learning experiences with explicit connections to other science disciplines and other subjects.

Less of this:	**More** of this:
Lessons are unrelated.	Lessons are presented in a logical sequence to develop understandings.
Lessons build on prior learning but only for the DCIs.	Lessons work together with students' foundational knowledge and practice from prior lessons and grade levels.
Science domains are taught in isolation.	When appropriate, science domains are integrated to show connections.
Other subjects, when included, are not intentionally chosen to support grade-level standards.	Grade-level appropriate standards from ELA, math or other subject areas are integrated with science learning.

Specific Evidence from Materials
The progression of each lesson is topical rather than storylined, so students are learning different topics that add to the overall DCI. This does not allow for students to apply their understanding of the phenomena and the use of CCCs as well as units that are storylined and integrated. PES page 153 – Project sky disk – images from very first lesson – these cycle through as students try and solve the problem provided in the first lesson. Unit 1 ideas: throughout the unit PES students are focusing on collecting evidence to support a claim they are making that aligns to the anchor phenom and investigative phenom that are mentioned throughout. Every lesson builds from lesson to lesson (the investigative phenom for each lesson starts with the ideas students should have learned in the previous one, then adds a layer to that.) Students continually tie in their new knowledge each time to both the phenom. And the guiding questions for the UCLA. It is all embedded and students go deep into the content.

PES: the units are topical rather than storylined so although these build cohesively within a unit, they stick to the same DCI, and don't intentionally integrate DCIs (aside from Engineering).

There are 4 units for fifth grade: Patterns of Earth and Sky, Modeling Matter, The Earth System, Ecosystem Restoration

There is a Coherence Flowchart that provides an outline of each unit and how the unit progresses from lesson to lesson providing deeper and deeper knowledge throughout the chapters and overall unit. The unit is more storylined that the curriculum as a whole, cycling students through investigations that add to their understanding of the anchor with each activity and continually revisiting big ideas and phenom. Throughout.

To what extent do the materials support Criterion 1C? Include your reasoning.
Click or tap here to enter text.

Category 2: Instructional Supports

Criterion 2A: Assessing the Three-Dimensions

Instructional materials support monitoring student progress in all three dimensions.

- Multiple and varied assessments allow students to demonstrate learning in all three dimensions including application of knowledge in performance tasks.
- Formative assessments, including teacher, self and peer assessments, are embedded throughout to inform instruction.
- Assessments are unbiased and elicit direct, observable evidence from all students.
- A phenomena or problem drives tasks, and information from the task is required to complete it.
- Rubrics and scoring guidelines are provided for interpreting student performance including sample student responses

Less of this:	**More** of this:
Checks for understanding elicit only a few student responses or rely primarily on group projects.	Individual student artifacts are used to measure student understanding of each dimension.
Only summative assessments that measure the end point of understanding are provided.	Formative assessments provide feedback to adjust instruction and inform students of their progress.
Assessments are primarily rote memorization of facts and terminology.	Assessments reflect application of all three dimensions including tasks that are driven by phenomena or problems.
Only multiple-choice tests are given.	Multiple measures and types of assessment are used throughout.

Specific Evidence from Materials
Lessons include “of-the-fly assessments” for when teachers are circulating after a prompt or during an investigation. These can be found throughout investigations and include “look-fors” for what students should be discussing or doing as well as what to do if students need some prompting. These formative assessments also include what portion of a standard are being addressed at that point (in lesson 2.4) it is the crosscutting concept of patterns with the DCI). PES page 64: Unit pre-assessment – this is a guided discussion with questions that students answer in a whole group setting, using this as an opening assessment allows the teacher to determine general preconceptions. PES page 81: On the fly assessment: Look fors, Now what? And NGSS connections. These provide the teacher easy ways to see if students are understanding the content but also what to do if they are not. PES 81: daily written reflections: 5-10 minute written response to daily investigation questions.

PES page 174: On the Fly assessment with Look fors, Now what? And NGSS connections.

PES page 204: Student self assessment: Reflecting on the Unit's Central problem – there are 4 student self-assessments in the unit to determine their own progress towards the unit goals. The prompt is "scientists investigate in order to figure out how things work. Am I getting closer to figuring out why we see different stars at different times?"

To what extent do the materials support Criterion 2A? Include your reasoning.
Click or tap here to enter text.

Criterion 2B: Instructional Experiences

Instructional materials support equitable access to science knowledge and practice for all students.

- Students engage with direct (preferably first-hand), shared experiences that are relevant and authentic, serve as the basis for learning and meet the developmental needs of elementary students.
- Students' questions, prior experiences and diverse backgrounds related to the phenomenon or problem drive learning.
- Materials provide an opportunity to learn by allowing for the development of scientific understandings over time using multiple modalities.

Less of this:	**More** of this:
The lesson focuses on a topic that some students have experienced.	Direct experiences in the classroom provide access and equity for all students.
Student questions and prior experiences are not connected to the learning.	Materials provide supports for connecting students' own questions to the targeted learning.
Students read about what others have done.	Students learn through concrete experiences.
Only one or two modalities are used.	Multiple modalities are used throughout each instructional segment.

Specific Evidence from Materials
The initial investigation students are asked to write an explanation to answer the guiding questions for a unit. This is good practice to have students think about what they already know about the topic, however it limits students to answering just questions – rather than actually developing an explanation or model as an initial explanation of a phenomenon. Built into lessons is simulations using computers. The simulations are built to provide students with practice using models and informing explanations using the information gained from those models. *A concern would be if schools do not have that technology available (2 to 1 for computers) how would that affect the unit overall. There are specific instructions for students to gain practice using the simulation and for the teacher to give the students specific things to become familiar with the simulation for use in multiple lessons. The lesson progression provides opportunities for students to engage with the content and add to their understanding through a variety of ways – simulations, hands-on investigations, readings, discussion with peers. Many of the labs are simulations. There are hands-on investigations, but the majority of data collection comes from the simulations. Discussions are held based on the simulations. And if the simulations are not done properly or there isn't access to required computers, it would be hard to have a discussion.

PES page 49-54 images are used to elicit student ideas about the introduction to a unit. The images represent cultural ideas about stars through 6 different time frames and different cultures. They loosely connect to the guiding questions and phenom.

PES page85: Students work with a partner to explore a simulation and determine how the stars in the sky seem to change over time.

PES page 127: Simulation to collect data to fill into student worksheet for distances between different stars.

PES page 133: Students become a physical model of the star distances from above simulation – this is a k-2 grade band model as it does not require inputs and outputs.

PES page 157: Physical model – Explain that this model will help students understand how the distance to a star affects what we see from earth. – Students develop a physical model with a ball and a seed – all of the investigations up to this point and pretty cookbook. Students follow a set of directions to get to a prescribed outcome. The same is true with the simulations for the most part – when students are using a simulation is it under prescribed conditions with little deviation from those directions.

PES page 230: Simulation/data collection: Patterns of Earth and Sky Simulation – students observe the simulation and collect data. Students combine information from the model (head as earth) as well as the simulation to make sense of whe new see certain stars. The then collect data to provide evidence about their answer to the question.

PES page 277: As you know scientists investigate to answer their questions, they support their answers with evidence. We are going to look for even more evidence that will support your idea that Earth's spinning is the cause of the daily pattern of when we see the sun and other stars. – Students go on to see images, video to collect additional information.

PES page 279 Investigating how shadows change – students conduct a hands-on investigation to determine how the length of the shadows change each day at different times. Students are the model of the earth (Mt Nose) and add to their ideas started from the simulation.

To what extent do the materials support Criterion 2B? Include your reasoning.
Click or tap here to enter text.

Criterion 2C: Student Sense-making

Instructional materials support equitable access to science knowledge and practice for all students.

- Materials support student sense-making at both an individual and group level.
- Classroom discourse focuses on expressing and clarifying student reasoning with opportunities for students to share ideas and feedback with each other that supports the iterative and collaborative co-construction of explanations.
- Materials include supports for oral and written language processing to involve students in scientific discourse for sense-making including a language-in-use approach.

Less of this:	**More** of this:
The teacher tells students what they need to know.	Students figure out explanations through classroom discourse with each other.
The teacher calls on a few students to share reasoning.	All students have the opportunity to share their thinking orally or in writing.
The focus is only on getting the "right" answer.	Sense-making begins with initial student ideas that progress in sophistication.
Vocabulary is front-loaded. All students are provided with sentence frames.	Specialized vocabulary is embedded in the instructional sequence with multiple opportunities to use and development over time. Writing supports are differentiated.

Specific Evidence from Materials
Students are continually asked to discuss ideas from investigations with the class. Activity 4 tends to focus on student-to-student discussion utilizing the data from the Simulation completed in the lesson. Simulations are used throughout to aid in student sense-making. Many simulations are 2-1 requiring students to work together to complete a simulation. PES Page 57 students are asked to think about the images and how they relate to the guiding questions Page 88: Think-Write-Pair-Share, students respond in various formats for the prompt. Page 89 has a discourse routine to provide science talk in a low stakes setting PES page 135: Students use the model to discuss why the stars don't look like a flat square anymore. PES page 176 students answer the question "What is the closest star to earth? Using book, simulations, and physical models.

PES page 183: Discourse Routines: Word Relationships: at this point in the lesson students are using the words and ideas they have been working with to practice talking with partners "scientifically"

PES page 193: Discussing ideas, Students generate ideas to answer the Chapter 1 questions: Why don't we see a lot of starts in the daytime?" – this occurs multiple times throughout the chapter and this lesson is starting with the question. Helps review what was already learned and focus learning for this set of activities.

PES page 228: Think write pair share – as you participated n the model, what pattern(s) did you observe? Students are given specific prompts to go through each section think, write, pair, share to develop their thoughts to include the model and patterns into their ideas. They also have an opportunity to partner talk and further develop their ideas.

The online program provides a progress build for each unit – discussing how students ideas progress with each layer of the UCLA structure and within each cycling investigative framework.

To what extent do the materials support Criterion 2C? Include your reasoning.
Click or tap here to enter text.

Criterion 2D: Teacher Supports

Instructional materials support teacher planning and instruction.

- Materials include background knowledge in both science content and pedagogy and student preconceptions.
- Materials have clear and concise instructional directions and connections to the standards.
- Materials provide guidance to support differentiated instruction, extra support and extensions at the appropriate level for a broad range of learners.
- Materials include professional learning and additional instructional planning resources.
- Materials have supports for families to extend learning.

Specific Evidence from Materials
PES Copyright date 2018 by The Regents of the University of California Science background section for each unit contains background information about the 3Ds, rationale for the progression of the unit as well as student possible preconceptions. It is intended to provide the teacher with information they will need to teach prior to instruction occurring, and is explicitly not meant as student material. There are specific Pedagogical Considerations and Preconceptions built in and called out within the science background section. Within these sections there is also a boundary as to what the unit does not cover. The teacher science background section provides a good base for teachers lacking the content knowledge to understand what the unit and accompanying lessons will be about. Although the DCI is addressed mainly in the section, it lacks pedagogy aligned to integrating the 3Ds. Even the pedagogy section discusses briefly what the students will be doing but does not necessarily reflect the 3D integration. The sections with preconceptions align to what students should have learned in previous grades and provide a good starting point for teachers to determine what students may already know The section labeled Investigation explains the SEPs the unit focuses on – although also explains all SEPs are integrated throughout. However even with the list of SEPS there is no explanation as to how they are integrated within the larger context. The teacher materials include a “Standards at a glance” section with only lists the number or the standards and does not provide detail as to what the standards are or links to the standards documents. Lessons provide easy step-by-step instructions and potential scripts for teachers to use throughout each lesson. There are potential student answers built in as

well, and links (on the online text) are linked to the PowerPoint slide with the specific step of a lesson that it would be used with.
UCLA structure of the program allows for embedded structures that support learning at a deep level. This structure also allows for easy access at various learning points during the different units.

PES Page 89: Providing more experience: Home Investigation – provides an optional activity for students to do at home wit their family

PES page 180: Teacher Support: Background: Science Practices: About Evidence – describes the concept of evidence as a scientist and how that concept plays into the lessons

PES page 359: Lesson overview and lesson at a glance: these present the phenomena that will add to the unit phenomena that have been explored. The lesson at a glance provides time frames, titles of activities, brief synopsis, and either teacher led, simulation, student to student discussion for easy prep.

PES Page 360: Materials and Prep. Provides prep for classroom, students, group work for the lesson. There is also a section for UNPLUGGED? With a description of how the digital devices should be used for the lesson. Many of the lessons have had the option to run unplugged, but this one recommends students use digital devices. If that is not an option, it gives a suggestion to run the simulation as a class.

The online teacher page has a ton of resources for teachers for each unit including: Unit overview, unit map, progress build, getting ready to teach, materials and prep, science background, standards at a glance, lesson overview, standards and goals, 3D statements, assessment system, embedded formative assessments, books in the unit, apps in the unit, flextensions in the unit. – These provide easy access to important tools for teaching and teacher prep prior to beginning a unit.

To what extent do the materials support Criterion 2D? Include your reasoning.

Click or tap here to enter text.

Category 3: Student Materials

Criterion 3A: Program Design
Instructional materials represent a comprehensive K-5 core program.

- Materials provide instruction that correlates to our recommended instructional minutes for science.
- Materials are available in both English and Spanish.
- Graphic organizers and templates for science notebooks are included.
- Teacher and student materials have resources both in print and online.
- Multimedia supports are included such as videos, tutorials and simulations.
- Technology options are appropriate for both classroom and home use.

Specific Evidence from Materials

To what extent do the materials support Criterion 3A? Include your reasoning.
Evidence (no fillable box above): Online supports include all materials in Spanish – both the teacher and student versions of these materials are available digitally and available as a PDF for print. Reasoning: Providing print and verbal materials in Spanish and English allows teachers to plan and instruct attending to dual language needs. However this requires students to be literate in Spanish (many students home language may be Spanish, however that does not mean they have a formal academic understanding or use of the language). These materials would be beneficial for TWI courses for teachers to develop and use the language within the classroom. These materials would also be beneficial to help bridge the language gap of many students to support their understanding. However these do not serve to just provide students independently. The online student resources are easy to use and find. The student dashboard has access to all materials that would be needed for virtual learning. Additionally the simulations are accessible from the same dashboard. PES page 164: Lists materials including for classroom, groups of 4, pairs, individual students, digital resources and vocabulary. This also states if the lesson can be don't "unplugged" without digital devices.

PES page 179: Video “Lost in Light” and Instructional Guide – has video with timeframes to stop for teacher to discuss specifics.

Criterion 3B: Science Equipment

Instructional materials include hands-on materials and equipment that support three-dimensional learning.

- Enough materials are included to allow students to do the investigations themselves.
- Materials are of a quality that will last through many uses.
- Materials include the tools necessary to make observations and measurements and conduct investigations.

Specific Evidence from Materials
Patterns of Earth and Sky: Materials for the unit are listed in the overview section. The list denotes those that are included for use during multiple units, specific units, or ones that need to be provided by the teacher. The materials list also denotes which materials are consumable or non consumable. Many of the consumable materials are easy to find in a school (sticky notes, tape, etc.) *However these materials do need to be provided by the teacher! The materials are set up for a class of 36, and the consumables are only stocked for one use (according to the online list). They will need to be replenished after each use.

To what extent do the materials support Criterion 3B? Include your reasoning.
Click or tap here to enter text.

Criterion 3C: Reading Materials

Instructional materials include grade-appropriate texts that support three-dimensional learning.

- A range of text types and genres, both print and online, are embedded in learning experiences.
- Texts support context-specific academic vocabulary.
- Materials reflect the diversity of our students and society in a culturally responsive manner including different genders, from many cultures and nations, both contemporary and historical.
- Materials include supports for reading comprehension for a variety of student needs including high-quality questions.

Specific Evidence from Materials
Digital text and physical texts are included. PES Page 93: Partner reading lesson – students read the text with a partner and answer questions utilizing information from the text. PES 176: Students read a section of Handbook of Stars and Constellations so they can understand why most starts are not visible during the daytime. – Students gather additional data (an investigation was already conducted) through a text to help students make an explanation for the guiding question.

To what extent do the materials support Criterion 1A? Include your reasoning.
Click or tap here to enter text.

Referenced, adapted and formatted from the following documents:

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