Evaluator: Click or tap here to enter text.Grade Level:5th Program: TCI Bring Science Alive

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.

Examples of Evidence:

- ◊ Photographs of trash washed up on a beach that leads into a unit on waves in 4th grade physical science unit. (A first-hand experience, video, photograph or data set to start a learning sequence that becomes the "why" for further study grounded in everyday student experiences.)
- ◊ A time lapse video of a badger decomposing is shown to start a life science unit on matter and energy in ecosystems. Students return to the video throughout to explain what is happening.
- ◊ Garbage from the lunchroom is examined to start a unit on matter and how it changes in the 5th grade physical science unit.
- ◊ 3rd grade students explore balloons, aluminum cans, styrofoam beads, and transparent tape to make observations and generate questions about static electricity in the physical science unit, lesson 3.
- ◊ Students address the problem of communicating at a distance without sound following a study of light in the 1st grade physical science unit.

Specific Evidence from Materials
LTE: Anchor Phenom: Some Organisms can grow really big. For example, the Humongous Fungus grew to be as big as 1,665 football fields! Learn more by studying how organisms interact with their ecosystems! – This is listed in the teacher guide section, students then watch a video (1:09) that provides the storyline for the unit and introduces the humongous fungus. – Every unit starts with the same set up – Anchor phenom then video to introduce the unit storyline.

Unit 1 Lesson 1: How do you think different types of animals are able to meet their needs and survive together in the same place? – A slide show accompanys the guiding question and lesson phenom. The Phenom is explicitly called out "All sorts of different aniumals can meet their needs in the same area" with a picture of a bunch of animals (in Africa) in one location. Students are encouraged to ask questions about this idea once they see the slide.

U1L2: Introduces investigative phenom like the first lesson and has students ask questions about the short video.

U1L2: Making sense of the Phenom. – students return to the lesson phenomenon and answer the guiding question for the lesson. Students do not return to the anchor at the end of lesson 2.

Each lesson in a unit contains a "Lesson Phenomenon", these are related to the Unit Anchoring Phenomenon however, the lessons do not relate back explicitly to the anchor.

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

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.

Examples of Evidence:

- ◊ 4th grade students conduct an investigation using fair tests in which variables are controlled and the number of trials considered, including collecting measurements and representing data in tables, with balls and ramps to determine cause and effect relationships of speed and energy in unit 2 lesson 4.
- ◊ Students ask questions about waves moving objects and collaboratively investigate how to make different looking waves in water and analyze how these waves affect a floating object in the physical science unit.
- ◊ 3rd grade students generate, test and refine solutions to keep two moving objects from touching each other by applying ideas learned about magnets in lesson 9.
- ◊ With teacher guidance, kindergarten students conduct an investigation with peers to compare the effects of different directions of pushes and pulls on playground balls, student chairs and erasers on different surfaces in the physical science unit, lesson 3.

Specific Evidence from Materials
The standards correlations for each unit have information for each dimension as well as the elements that are addressed for the grade band for each dimension. Unit 1 L.1: Students go on an "ecological journey" to collect information about different ecosystems. Students arecollecting information, asking questions, and making connections between the different locations on the given map at each stop. This allows students to find patterns (CCC) ansk questions about those patterns and locations (SEP) and determine what interactions may occur. U1L3: the investigation in this lesson is to dissect an owl pellet. The activity itself does not include the three dimensions well, and seems more like just an activity, for activity's sake. The DCI is missing unless supported by the teacher out of the

investigation, the CCC is not supported and the SEP is not specific to specific to the grade band.

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 with intention.

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.

Examples of Evidence:

- ◊ In the first unit, students address the physical science standards around the phenomena of garbage and partially address a life science standard related to decomposers. In the second unit on ecosystems, students extend and apply their understanding of decomposers which leads to an engineering problem about materials such as plastics that do not decompose.
- ◊ 5th grade students are investigating water sources around the Earth and make connections to properties of matter in both the physical science and earth science units and prior learning about weather and climate from 3rd grade.
- ◊ 2nd grade students plan and conduct an investigation with water and earth materials as a whole class in one lesson and then in the next lesson students work with a small group to plan and conduct another investigation with wind and earth materials to further learning of core ideas and practices.
- ◊ Students apply ELA learning to write a set of directions for conducting an investigation in the earth science unit, lesson 6.
- ◊ Students use line plots to analyze climate data in grade 3, unit 4.

Specific Evidence from Materials
Units: There are 4 units in the program labeled as Unit 1: Living Things and Ecosystems, Unit 2: Earth's Systems, Unit 3: Changes in Matter, Unit 4: Earth, the Moon, and the Stars. – Although there is a numerical order to these units, they are topical rather that utilizing a overall storyline running through them. As a result they could be taught in any order. The units themselves do have a storyline structure that embeds context into the unit. LTE Unit Storyline: The TV Show "Colossal Travels" visits some of the largest organisms in the world! How do these trees, animals, and fungi grow so much?

Learn more by studying how organisms interact with their ecosystems. – This provides context for the investigations throughout the lessons.

U1L1: After several investigations and discussions students return to the phenomena to make a claim about what they learned and answer the guiding question. A Claim Evidence Reasoning chart is provided to support students in making a claim about the phenom and guiding questions.

Each Lesson follows the same progression: Observing Phenomena, Investigation, Making Sense of the Phenomenon, Vocabulary, Super Simple Science

There seems to be some coherence within a unit, although even within a unit the lessons don't build upone each other, but rather explore the same phenom in multiple ways (fungi, vs bison, vs tree – they all need energy to grow type of thing).

The units are also topical so any coherence across units is limited.

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.

Examples of Evidence:

- ◊ As students are engaged in a performance task in unit 3, lesson 2, there are indicators for teachers to look for and information about possible responses. This information is embedded in the lesson.
- ◊ In unit 1, there are two performance assessments, peer feedback throughout, exits slips, a summative assessment, and a prewrite.
- ◊ Individual student learning is assessed using written work that answers the driving question of the unit. (Earth Science, p. 76)

Specific Evidence from Materials
Unit performance assessment aligns with the anchor phenom. The the LTE Unit "Students find a local plant to support an argument for how it gets materials to grow. Students use this information to develop a model for how matter cycles through an ecosystem." U1L1: An ecosystem is all the living and nonliving things that interact in an area: students are supposed to rank their own understanding of this on a slider tool. U1L2: The lesson assessment is a fill in the blank with the vocabulary words from the lesson. It is one dimensional (DCI PS3.D) and vocab heavy.

U1 Game – A virtual submarine dive asks students DCI questions and if they answer correctly the animals they find light up.

All units have Performance Task at the end which also includes a rubric that is specific to each of the 3Ds outline in the unit. The Performance task for unit 1 has students developing a segment of a tv show to explain a model of how energy cycles through an ecosystem and individuals. This does align to the phenomena throughout the uni. It provides enough supports for students to be successful with demonstrating their knowledge, but also requires them to understand the science to be successful.

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.
- Materials provide opportunities for students to make connections to and explore the natural world outside the classroom.

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.

Examples of Evidence:

- ◊ Students develop physical models of a landfill as open and closed systems to observe during the 5th grade garbage unit.
- ◊ Students identify components of garbage disposal in their homes and communities which connects the phenomena that started the unit.
- ◊ Students conduct a first-hand investigation of erosion and deposition using a stream table, observe time-lapse videos of landslides, engage in a virtual investigation, read accounts of earth changes by wind and record changes to the playground after a snow event in the 4th grade earth science unit.
- ◊ Students raise trout from eggs in the classroom and make observations over time as part of their study of traits in the life science unit.

Specific Evidence from Materials
U1L2: Conducting the Experiment and Experimental Plant A: This is considered an experiment (standard one plant gets water one does not) but students don't actually perform the investigation, thbey look at slides and results if someone else doing the experiment. Students only thinkg about the results. This doesn't allow students first hand experience with conducting an investigation. U1L3: Dissecting the Owl Pellet – students dissect an owl pellet. The lesson phenom is supposed to be related to "Pigs grow larger as they eat". Although these are connected, there is a disconnect as to energy transfer and digging through an owl pellet and that connection remains vague throughout the lesson. The students are asked to develop a model of energy transfer as a result of dissecting an owl pellet, but this is a weak transfer of knowledge.

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.

Examples of Evidence:

- ◊ 5th grade students develop models of how scents travel that are refined over the course of a three weeks using a combination of visual and written language providing multiple opportunities to develop precise vocabulary in the physical science unit.
- ◊ 3rd grade students answer questions in their notebook individually using pictures and words to explain their initial ideas about how static electricity works and have the opportunity to revise this after discussing with a peer and the whole class in the physical science unit.
- ◊ The teacher facilitates a class discussion using a word wall where kindergarten students share observations with a shoulder partner and the whole group about the kinds of things in their homes to figure out that the things we need come from nature.
- ◊ Suggested sentence frames are included to support oral and written responses when needed with the goal of independence.

Specific Evidence from Materials
U1L1: Debriefing the Trip – class goes through the ecosystems and describes the information they collected as a class, an additional video (:13) has students think deeper about the big ideas that they discussed and to add that information into the ecosystems. Guiding questions are posed, but the answers are not given to students by the teacher or the video. The teacher serves as a guide for the discussion. U1L2: The wrap up has students discuss 4 questions. However the 4 questions are very DCI based and not neceassarily gotten from reading through the results of the investigation (they did not conduct the investigation, they read about it).

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 and offers suggestions for how to help their student(s) at home.

Examples of Evidence:

- ◊ Information prior to lessons gives teachers things to except that students may already know in unit 1 p.12 in addition to how their understandings will build.
- ◊ 1st grade students have a choice to investigate different variables related to shadows, and suggestions are included as well as extensions to do at home. (Light unit, p. 40)
- ◊ The assessments include recommendations for additional supports when students don't meet expectations. "Students may struggle to articulate that scientists look back at the data they collect to look for patterns and to draw conclusions about phenomena. One way to support them in this thinking might be to share an anecdote such as, "When I was growing up, my mom used to measure my height by marking it on the wall in the pantry. When I look back at those marks, I notice patterns, like that I grew faster between the ages of 5 and 8 than I did when I was older."" (p.14)
- ◊ Students make observations of the sky with their families, looking for patterns over time. Families are provided with background information on how to record observations and what patterns to expect.

Specific Evidence from Materials
Units each have sections to click on for more teacher information: Unit Highlights, 3D learning progressions, explanaing the Anchor phenom. And Unit progression. The Unit progression document (clickable) lays out the Unit anchor and storyline but also includes the progression of lessons across the unit. Each lesson includes information about the lesson phenom, each fo the 3Ds addressed in the lesson, the associated PE and connections back to the anchor phenom. Each lesson has a planning section for teachers (online) that includes seceral tabs – Blended Learning, Lesson Overview, Materials, Learning Progression, Differentiating Instruction, Enhancing Learning, Science Background. – These sections include information for planning purposes as well as pacing, objectives and prep work to be done prior to instruction. Unit1 L1: The online resources are super accessible and easy to use. There is a ton of resources aside from just the lesson. Each part in a lesson also includes various supports that teachersmay need to implement. The Take you own ecological journey has built in timers for virtual or digital use, as well as additional components specific to this investigation including Connecting to Phenomena, Lesson support, Class map ideas, Misconceptions, Universal Access

for EL, Students with Special needs, NGSS components, Math and ELA components, and ELD tips for emerging, expanding and bridging students.

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 and when appropriate reflect the diversity of our students and society in a culturally responsive manner including different genders and sexual orientations, from many cultures and nations, both contemporary and historical.
- Technology options are appropriate for both classroom and home use possibly including translation capabilities.

Examples of Evidence:

- ◊ There are four units, each representing nine weeks of instruction at 180 minutes a week. This is short of our recommended minutes of 240 minutes a week for 5th grade.
- ◊ There are 132 60-min lessons for the whole year. This correlates to our recommended instructional minutes of 220 minutes per week for grades K-2. (3-4 60-min lessons per week)

Specific Evidence from Materials
Each unit has online access to all materials. There is also a blended learning tab for planning purposes for teachers. U1L2 Fast Track Lesson Guide (55min) or Master Lesson Guide (93 minutes) each lesson provides two different lesson durations with ideas as to when to use each the fast track tends to be about ½ hour less that then extended guide, but this gives teachers options to tailor the lesson to meet the needs of their learners. Online resources are available in both Spanish and English – beneficial for teaching purposes. The technology enhancements are very accessible and include a speaker button to have the prompts read aloud (both in enbglish and in Spanish) The materials are all accessible digitally and can be loaded to a google classroom (not necessary for Washoe, but still a nice accessibility feature).

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

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.

Examples of Evidence:

- ◊ There are enough thermometers, graduated cylinders, balances, magnifying glasses and measuring tapes for a whole class to use in small groups.
- ◊ Everything is included to engage in the lessons except for things that would already be found in the classroom like tape and colored pencils.

Specific Evidence from Materials
The materials are easily obtainable (both the permanent and consumables). A refill kit can be purchased separate from the all materials kit (however many materials are easily found in a classroom or school already). The consumables are fine. The permanent materials (such as the triple beam balance) are of a high enough quality that it will last for years if taken care of. The materials are also labeled as to what bin they belong in making them easy to find. The online TE has a list of the materials and pictures of each material for each lesson as well as the whole unit. This includes copies of student materials to be printed. This is convenient that it is all in one place.

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 and sexual orientations, 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.

Examples of Evidence:

- ◊ Texts include an interview of Sylvia Earle and profiles of Chien Shiung Wu and Benjamin Banneker. These highlight the connections to the science students are learning. Pictures of scientists working in the field represent the diversity of our students.
- ◊ Cultural myths about the sun and stars are included in the earth/space science unit.
- ◊ Vocabulary is highlighted in the reading that follows a concrete experience where the vocabulary is first introduced.

Specific Evidence from Materials
Click or tap here to enter text.

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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Washoe County School District Needs Evaluation

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