Evaluator: 27 Grade Level:2 Program: FOSS

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
Students grow and observe the life cycle of mealworms, plants and milkweed bugs Sand, Silt and Pebbles 1.1 and 1.4- Observe rocks ad examine with hand lens, how many different kinds of rocks are int the bag, properties, what happens when

you rub the rocks together (simulating weathering) then moves to going into school yard to examine properties of rocks

To what extent do the materials support Criterion 1A? Include your reasoning.
Phenomena are engaging and builts on students everyday lives. There are anchoring phenomena and the engineering design tasks are problems that arise from the phenomena.

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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
Investigation 1- Mealworms allow students to engage in multiple practices. These practice are also included in other investigations thoughout the unit. In this unit, students raise mealworms and watch the needs and the lifecycles of the worms. Students monitor, observe and attend to the mealworms needs. (All components are included to make this lesson 3-D) They then go on to apply their knowledge with other insects. They observe the mealworms over time

To what extent do the materials support Criterion 1B? Include your reasoning.
Lessons integrate 3-D learning and students have multiple experiences with the dimensions. Engineering is included in at least once per unit

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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
Math Extensions – Create graph of mealworms (Insects and Mealworms) Solid and liquids: First students explore what materials solid objects are made of, then properties, then grouping… then moving to liquids, Then the mix of solid and liquid particles. Connects to Common Core – Online:Identify the main purpose of text including what the author wants to answer, explain, or describe (Read and discuss articles within text (Investigation 1 part 1 step 17) Focus Question with each lesson that drives the learning of the lesson

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Math: Rock graph Large and small- Describing the graph Investigation 2- Pebbles, Sand, Silt

To what extent do the materials support Criterion 1C? Include your reasoning.
Lessons are coherent and build upon each other as the unit progresses. They support students prior knowledge in all 3 dimensions. They fit together and scaffold information. The connections between ELA and Math make sense and connect to the lesson.

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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
Online games to help support concepts. Focus Question given to focus students: What do meal worms need to live? – Each investigation has embedded assessment in science notebook entry. Online: Regional Resources: Nevada Wildlife Federation_ Schoolyard Habitats Pre/Post Test given after each unit Science Notebook kept throughout all units-students writing – Formative assessment

To what extent do the materials support Criterion 2A? Include your reasoning.
Pre and Post test help guide learning and see students strengths and weaknesses and the grading rubrics help teacher identify strengths and weaknesses

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Multiple types of assessments are given and driven by lessons.

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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
Equity given through differentiation of lessons with limited English, Low SES Students Raise Bugs and plants in classroom Students find outdoor locations where young plants can grow and thrive- Plant seedlings outdoors and observe over time. Life Cycle Unit Students have concrete experiences:rubbing rocks and exploring erosion, students feel the rocks and the dust and make observations- Pebbles, Sand and Silt – Lesson 1.1

To what extent do the materials support Criterion 2B? Include your reasoning.
Authentic learning that students can use to make connections. Students have direct experiences with manipulatives. Materials help students build understandings.

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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
Meaningful home/school activities to promote exploration of ideas from unit Home/School Connection Investigation 1: First Rocks Students grow meal worms, make observations and then label vocabulary and explain the life cycle (Investigation 1 – Life Cycle) and write abou the life cycles. Show video on how plants grow- Have sense making discussion about ideas on plants (pg 155 Life cycles) – Sense making circles where students engage in scientific talk sentence stems are given to support students ideas and turn and talk to scaffold learning Graphic organizers: The Story of sand:largest to smallest stones Inves. 2 Sand, Silt and Pebbles

To what extent do the materials support Criterion 2C? Include your reasoning.
Materials support sense making at individual and group level. Classroom discussions help build understanding. Sense making circles allow students to see different ideas and co-construct explanations. There are written and oral supports given for students.

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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
Teacher prep videos for each investigation:Pebbles, Sand and Silt Investigation 1 Part1 Question sentence stems for teachers to promote conversations F8 (Teacher's Manual Pebbles and Sand) Adjustments given for Low SES and Ethnicity F21- Pebbles and Sand Gives Background for the Teacher on What do Mealworms need to live, how do mealworms change and grow (Insects and Plants 78-79) Lessons laid out with Materials, getting Ready pg 86-87(insects) Videos on Sense-Making Discussions, Science Notebooks… to help support teachers

To what extent do the materials support Criterion 2D? Include your reasoning.
Videos will help teacher organize the materials they need, what to look for and best practices in teaching. Directions are clear and manuals give teachers the science content and the pedagogy to help students. Materials provide professional learning by having videos on sense making videos.

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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
Spanish and English Videos available Online Games-Pebbles, Sand < silt Property Chain Game There are 3 units. With in the Solid Liquid Unit there are 4 units and each unit has 4 -5 parts. There are a total of 19 lessons total in this unit. The units are meant to be taught in a 12 week period. Lessons are scheduled for approximately 50 minutes so over 12 weeks- approx. 80 min. per week. -Lesson Powerpoints are available online in Spanish and English Student books are available in audio form

To what extent do the materials support Criterion 3A? Include your reasoning.
Lessons meet the sciene requirements for lessons, multimedia supports learning and graphic organziers are present. Studnets can use technology in school as well as at home.

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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
There are multiple copies of some materials for students to have them on their own (Materials- ceramic, fabric, leather, metal, paper, plastic, rubber and wood (solids and liquids – Investigation 2) There are 32 books for students to have their own books. There are some materials for students to work with partners (16 droppers … Solids and Liquids) and in small groups (5 card deck sets for memory – Solids and liquids)

To what extent do the materials support Criterion 3B? Include your reasoning.
There are enough books for students to have their own books. The materials invesigations are meant for partners and small groups. Consumables are easily replaced with common items.

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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
Text Supports content Vocabulary and there are check to assess understanding of reading "Flowers and Seeds" Review- Notebook Masters pge 8– There are colorful pictures, bold words, captions 32 Student books are given that are reusable for year after year Text support invesigations and supports vocabulary- Students explore properties of rocks and then read about different properties in books.

To what extent do the materials support Criterion 1A? Include your reasoning.
Text supports content vocabulary and key words are bolded. There are diagrams (Plant lifecyles (pg22) in addition to picture support. It supports concepts that were explored in previous lessons. There is an audio version available on the online texts for struggling or second language learners.

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Referenced, adapted and formatted from the following documents:

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Washoe County School District Needs Evaluation

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