Washoe County School District K-5 Science
2020 Instructional Materials Evaluation Rubric
(Community Members, Administrators and Families 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.

- A good phenomenon builds on everyday student experiences and targets grade appropriate learning goals.
- Engineering design solutions are tied to grade specific science ideas.

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 bucket of water is physically explored by students and leads to exploration of properties of matter in 2nd grade.
- ◊ 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 take on the role of light and sound engineers as they are challenged with a design problem to design, build, and then project a scene for a puppet show. The unit's reference book serves as a source of secondhand data. Investigation notebook to record observations. Vocabulary cards (pocket chart and individual) Explanation Language Frames cards (vocabulary with visuals) Photographs to observe phenomenon Multi-language glossary Print materials for classroom wall Student books and big book for each chapter

To what extent do the materials support Criterion 1A? Include your reasoning.
Materials allow students to observe, discuss, and explore the phenomenon in the anticipation of being engineers in the culminating engineering design. Although the lesson overview compilation states, “An introduction to the puppet-theater company’s problem provides motivation for students to engage in working toward a solution to this problem,” I would have to disagree with that assumption. How many of our students have seen a puppet show or participated in one? Teachers use Reader’s Theatre, but I have not seen that media performed like a puppet show. While the chapters, each with a guiding question, are appropriate to the grade level content, I wonder if the activities are engaging enough for first grade students in general and in particular our English language learners and our students with special needs. There is multi-media used to gather knowledge (create, observe, listen); however, it is not in balance with opportunities to explore and wonder about the phenomenon.

Criterion 1B: Integrating the Three-Dimensions

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

- Students are doing science as scientists would to explain the natural and human-built world.
- Materials use an inquiry-based and problem-solving approach where students engage in the practices of science and engineering.
- Science and engineering are not presented in a linear manner; they are messy.

Examples of Evidence:

- ◊ Students conduct an investigation, including collecting data, with balls and ramps to determine cause and effect relationships of speed and energy in unit 2 lesson 4.
- ◊ Students investigate how to make different looking waves in water and how these waves affect a floating object in the 4th grade 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.

Specific Evidence from Materials
Standards and goals delineate the three-dimensions. Every chapter includes the problem to solve, a chapter question, and an investigation question with the intent of gaining knowledge to address the problem. Diagramming of solution comes after the revision stage of their design. The lessons are scaffolded in a linear manner with each question building towards generating a solution.

To what extent do the materials support Criterion 1B? Include your reasoning.
The materials do not appear to lend themselves to self-discovery by the students. This particular unit does give students knowledge about some of the work scientists and engineers do to solve problems. I wonder if the students had other ideas such as generating a Tik Tok video or a music video would teachers be savvy enough to gear the chapter's lessons toward that idea.

Criterion 1C: Coherence

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

- Materials make connections between lessons, units and grade levels.
- Students engage in learning experiences with explicit connections to other science disciplines and other subjects with intention.

Examples of Evidence:

- ◊ 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.
- ◊ Students apply ELA learning to write a set of directions for conducting an investigation in the earth science unit, lesson 6.
- ◊ Line plots are used to analyze data in unit 4 at the 3rd grade level.

Specific Evidence from Materials
The chapter questions do allow for connections to the problem to be solved. Cause and effect is a cross cutting concept across content areas. Explanation language frames support explanatory writing. Sorting cards Diagramming Kinesthetic activities Reference book and student books 3D Assessment

To what extent do the materials support Criterion 1C? Include your reasoning.
The focus on asking a question and finding an answer is clearly a part of the ELA standards, and provides for multiple opportunities for students to engage in speaking, listening, and writing. Explanation language frames support our students with special needs and EL learners. Diagrams are often found in non-fiction texts and in math texts.

Kinesthetic activities offer multi-modalities for learning

3D Assessment chart shows how the performance expectations connect across content and disciplines.

Reference books support the research component of writing and gathering information to help problem solve.

Unit overview provides information on how content is connected to content in a higher grade.

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.

Examples of Evidence:

- ◊ As students are engaged in a performance task, there are indicators for teachers to look for and information about possible responses and next steps. 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
From Progress Build: organizes the sequence of instruction, defines the focus of the assessments, and grounds inferences bout students' understanding of the content, specifically at each of the critical juncture assessments found throughout the unit. Assessment guides/rubrics Clipboard assessment tool Formal and informal assessment Summative assessment Progress monitoring Grading

To what extent do the materials support Criterion 2A? Include your reasoning.
Emphasis on students demonstrating knowledge through their oral and physical responses to prompts during partner and class discussions which is vital to developing oral language skills. The clipboard assessment tool supports this type of assessment quite nicely. Providing teachers with possible student responses aid teachers in promoting student understanding of the concepts. The varied assessment components would work nicely in a PLC to discuss student progress toward the performance expectation.

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.

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 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
Students walk the school to find light/sound sources, investigate how to make surfaces look bright, engage in kinesthetic blocking model/passing through model, draw and write to explain, plan, test and revise,

To what extent do the materials support Criterion 2B? Include your reasoning.
There is limited opportunity (2 walks to find light/sound sources) to make connections to and explore the natural world outside the classroom/school. There is some diversity represented in the student books. There is still a concern around the engineering problem being relevant to students in Reno.

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.

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 a magnet 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
Sentence frames to support explanatory writing. Vocabulary with visuals for exceptional learners. Class discussions after a learning walk, Use of investigation notebooks to write about learning, some diagramming, a few writing opportunities. Materials relevant to the unit are premade and can be posted in the science area or on pocket charts for reference during the unit. There is choice in how the reading materials are utilized, such as students skimming the book for a picture they find interesting as a light source and sharing information with a partner or with the class.

To what extent do the materials support Criterion 2C? Include your reasoning.
The materials provided align with the developing and diverse needs of first grade learners. The premade word cards and sentence frames are an added benefit for teachers in their prep for the unit.

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 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
2 page "Information about the NGSS for Parents and Guardians of First Graders" Background about the disciplinary core ideas, science and engineering practices, and cross cutting concepts are included. Preconceptions are addressed Engineering and design practices are explained with the EDC Explanation of the cross cutting concept is included. Preparation lists are provided for teachers to be ready to teach the lesson. Specific ideas for differentiation are provided for various groups of students. Power point slides

To what extent do the materials support Criterion 2D? Include your reasoning.
The strength of the supporting materials is in the background knowledge and differentiation ideas especially for our EL learners. Especially nice for teaching and learning are the power point slides already created for the unit to help guide instruction providing key points, objectives, and directions for activities!

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
Elementary Student Apps provide digital copies of student books in English and Spanish, can be read to them. Digital resources are available as slides in PDF, Google as are student sheets available in google Digital navigation structure available Hands on investigations are available as YouTube videos for home/distance learning Unit extensions such as Field trips, research project, STEAM extensions This unit consists of a pre-assessment and 4 chapters; the program consists of 3 units so I believe it would fit within our teaching day.

To what extent do the materials support Criterion 3A? Include your reasoning.
Loved their online/distance learning materials; appear easy to use. The program does include an investigations notebook that appears more workbook-like than an investigatory journal.

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
Kit materials can be used twice for a class of 36 students. Materials to be provided by the teacher to teach the unit once to 36 units.

To what extent do the materials support Criterion 3B? Include your reasoning.
I would be concerned about the teacher provided materials and ensuring the District is able to purchase those supplies, as well as the kit materials when needed. The student books/big books appear to be of an acceptable quality.

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
Reference book specific to the content. One book for each chapter in the unit evidences diversity of people in the photographs. The books are available online to be read to students if needed. The books introduce students to features found in non-fiction books. Problems/solutions is the focus of one

To what extent do the materials support Criterion 1A? Include your reasoning.
Although the unit offers one book to support the question of the chapter, it would be beneficial to have more texts on the subject. Currently there are no light or sound books in the digital library. This would be an additional costs to schools/teachers.

Referenced, adapted and formatted from the following documents:

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Nolan, C. (2015). *Getting their hands dirty: Engaging learners in authentic science practices outside the classroom* (Practice Brief No. 20). STEM Teaching Tools.

Washoe County School District Needs Evaluation

Washoe County School District. (2020). Request for Instructional Material Submission RFP 2020A.