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
Unit 3, Changes in Matter, lesson 1- What Is Matter Made Of? "Phenomenon: The balloon changes size and shape when the girl blows into it" Unit 3, Changes in Matter, "Anchoring Phenomenon: When pale gooey liquid batter hits the griddle, it turns into a golden fluffy solid pancake." Local connection to phenomenon example: Unit 1 science journal, p. 7 "Head to your local park and observe the animals that visit. How many different types of animals do you observe?" but also provides a picture of animals at a watering hole (zebra, elephant, gazelle, etc.)

To what extent do the materials support Criterion 1A? Include your reasoning.
Anchoring phenomena provide students with a context to their learning as they develop their understanding of the concept by explaining pieces of the anchoring phenomenon as they go. For example, in Unit 3 "Changes in Matter" the unit asks students to make sense of how liquid batter turns into solid pancakes. They do this through exploring what matter is beginning with understanding that gas takes up space through the exploration of why a balloon changes size and shape when inflated. The progression of understanding students will go through is very well laid out in the teacher guide and is apparent in the lessons as well with tangible experiences for student sense making. After each lesson in a unit students are asked to return to their explanation of the Anchoring Phenomenon and add their new learning to their understanding.

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
Unit 3, Changes in Matter, Lesson 7- How Do Engineers Improve Materials? Creating a Control Recipe "As a class, make a control recipe: Mix together 60 mL of water with 15 g of flour (about one heaping spoonful) in a bowl. Keep the bowlin a plastic tub in case of spills. Stir for 1 minuts. Then, allow the glue to dry for 1 hour before testing it. While the glue is drying, think of some properties that glue needs to be effective." Unit 3, Changes in Matter, Lesson 5- What Causes Substances to Change?, Planning Mixtures "You will investigate substances to determine which combinations cause new substances to form."

To what extent do the materials support Criterion 1B? Include your reasoning.
Instructional materials has intentional integration of SEPs, CCs, and DCIs. Some lessons have structured experiments (see glue example above) while some experiments are open for students to design and test to make sense of the content (see above). Engineering was not as obvious in this unit because it was built into the design process for the experiments.

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
Unit 3, Changes in Matter, Learning Progressions lists what students learned in second grade (2-PS1-3), what they will be doing in the lesson, what they should understand after the investigation (5-PS1-1), and where their learning will go in middle school (MS-PS1-1).

To what extent do the materials support Criterion 1C? Include your reasoning.
Interdisciplinary Connections are provided and Math & ELA CC standards are stated. Discussion prompts, drawing prompts, research ideas, and others are provided. This shows that the ELA connections are intentional. Learning progression is provided and states the NGSS PEs that are prerequisites for the unit as well as in previous units and lessons. It also shares where they are going next with this understanding (see above). Lessons build on one another but the teacher manual recommends teachers read through all of the lessons then they can choose where they want to start. This makes me wonder if the lessons are truly cohesive enough to be taught out of order? A list of what lessons must be taught is provided. These lessons teach concepts students have not been introduced to in previous years' content.

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
In unit 3, Changes in Matter, there are 7 end of lesson assessments correlating with the 7 lessons in the unit, there is an end of unit summative assessment that requires students to explain their understanding of the anchoring phenomenon using what they have learned through out the 7 lessons. Performance assessments have student working together but an individual rubric is provided. These performance assessments are hands-on. Summative assessments assess all parts of the PE, the questions have a mix of DOK from 1-4. Formative assessments include lesson games, phenomena explanations, student journals using claim, evidence and reasoning, checks for understanding for student are provided with interactive tutorials, simulations help students check their own understanding.

To what extent do the materials support Criterion 2A? Include your reasoning.
Formative assessments include student journal entries that ask students to explain their understanding of the anchoring phenomenon as well as lesson phenomenon, students are then asked to use what they have learned from each

lesson to adjust their understanding of the anchoring phenomenon using what they have learned throughout the unit.

Summative assessments include lesson assessments as well as unit assessments (see above).

Scoring guides are provided for both formative and summative asessments that include sample student responses.

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
In unit 3, Changes in Matter students explore changes to matter (a balloon inflating, ice melting, sugar dissolving, wood burning, etc.) to build their understanding of the structures and properties of matter.

To what extent do the materials support Criterion 2B? Include your reasoning.
The phenomenon students experience throughout the unit are first-hand experiences, if they are not hands-on first-hand experiences students are provided with a video or other form of exploring the phenomenon that allows students to have a shared experience to build their learning. Multi-modal learning was provided in the form of discussions, writing prompts, science notebooks, experiments, as well as videos that students could watch.

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
5th grade students, in lesson 3 of unit 3, are asked to "design an investigation to identify an unknown substance by its properties." This builds on their previous understanding from lesson 2 that substances can be solid, liquid or gas and can be mixtures. Students conduct experiments with partners, have whole class and small group discussions, as well as record their understanding in their science notebook.

To what extent do the materials support Criterion 2C? Include your reasoning.
The materials support student sense-making at an individual level, small group level, as well as whole class. Students are given opportunities to discuss their understanding with their peers to deepen or improve understanding. There are multiple opportunities for oral and written processing as students develop content understanding. They are provided opportunities to explain concepts in their own words and then provided with the academic vocabulary that connect to their understandaing.

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
Unit overview provides a suggested order for lessons and then explains which lessons must be taught and how students will build their understanding of the anchoring phenomena as they progress through each lesson in the unit. Pacing provides a fast track and master investigation time: p. 28 of Grade 5 review guide " Fast track investigation- 69 minutes, master investigation 97 minutes. Pacing is provided for each section in as small as 1 minutes increments and as large as 38 min. Safety tips, lesson supports, materials, student helper roles are provided. Science background is provided such as science vocabulary and concepts being taught. Student Science Journals are provided in English & Spanish.

To what extent do the materials support Criterion 2D? Include your reasoning.
Instructional materials support teacher planning and instruction by providing what students should have learned in previous grade levels, where their learning is heading in future lessons as well as grade levels. Teachers are provided with support for language development as well as supports for students with IEPs. I did not see home connections.

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
There are 4 units, each with 6-8 lessons. The lesson range from about 30 minutes to over an hour depending on if you follow the Fast Track Lesson Guide utilize the extensions. This is less than 1 lesson per week of a school year.

To what extent do the materials support Criterion 3A? Include your reasoning.
If assessment time is included in instructional time the materials provide instruction that is slightly less than the districts' recommended instructional minutes for science. Materials are available in English & Spanish. There are science notebooks for students to utilize as they develop understanding of concepts. These contain passages to read as well as graphic organizers to sort their ideas. Phenomenon are provided in multiple formats such as video, hands-on experiments, and photos. Studetns can access their student notebook online but are also given a printed copy. There are many supports for distance learning.

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
Consumables are available for order, each lesson's supplies are grouped in a bag. Everything is provided including materials that could be found in a typical classroom.

To what extent do the materials support Criterion 3B? Include your reasoning.
All materials are provided in lesson kits. I did not see how long these materials are expected to last or how many students each kit's consumable materials are expected to support.

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
Additonal reading opportunities are provided in a list of books that connect to concepts. They are listed by title with a short description. 5 reading passages are provided for each lesson to deepen student understanding.

To what extent do the materials support Criterion 1A? Include your reasoning.
Texts are provided that support student sense making. There are discussion questions for the texts as well.

Evaluator number: 14 Grade Level: 5 Program: Bring Science Alive!

Referenced, adapted and formatted from the following documents:

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Washoe County School District Needs Evaluation

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