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
This program explicitly tells the teachers what the phenomena is they are teaching in the lesson overviews for each lesson. There is an anchor, everyday and investigative phenomena mentioned. An example is a picture of an ancient artifact depicting night and day. This is suppose to lead them to the idea of patterns of

night and day. The lessons seem to go with the investigative phenomena and the anchor phenomena is revisited throughout the unit.

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
Amplify says on pg 26 of the manual for Patterns of Earth and Sky that all units will only cover 5 of the SEP's and within each unit only one SEP is covered. On page 28 of the this manual only two Cross Cutting Concept is taught for the unit. In the Earth system manual only one is taught as well. The 3 Dimensions seem disjointed. In Lesson 2-1 Patterns of Earth and Sky, the students learn modeling and it's importance. The next lesson talks about data collection, they do an activity collecting data. They collected data from a simulation activity. The students are not usually doing the 3 Dimensions themselves. The 3 Dimensions are taught separately and at different times throughout the unit.

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
In each unit ,except for the Patterns of Earth and Sky, molecules is addressed in some form. The Earth System and Ecosystem Restoration unit make connections to molecules and matter that are taught in Modeling Matter. There are ELA and Math connections in all units. The Investigation Notebook for the student has notetaking, and reflective writing. Students collect data but the data tables are given to them. In Patterns of the Earth Sky they plan and complete an investigation for constellations. They plan an investigation at the end of each unit. The individual lesson do build off of each other.

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
In almost all lessons there are "On-the-Fly" assessments that tell teachers what to look for and what to do if students are having trouble with the topic. Example: On page 112 in the Ecosystem Restoration unit for 5th Grade teachers look for synthesizing ideas. Summative assessments were at the end of the unit. There is a written argument section which is performance task, there is a digital component to the test as well or student discussion. The materials you give to the students are not in the teacher manual they are on the website and would need to be printed from there. The end of the unit argument assessment is differentiated. There are two versions, one with writing stems and one without. Rubrics are provided to grade them. At the end of each chapter there is a scientific argument activity to be used to help assess their understanding of that chapter. The

arguments are driven by the phenomena given for the unit. The Investigation Notebook looks like it could be used for formative assessment after each lesson.

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
In this program there is a lot more digital simulation of models and concepts and less of the students actually doing the science. For example, in Modeling and Matter there are 4 hands-on activities out of 10 lessons in Chapter 1. In Chapter 2 there are 5 lessons, one is hands-on. There are plenty of opportunities for students to discuss, a lot of reading and writing, and using simulations on-line. In the Modeling Matter the students use chromatography to decide if food coloring is a mixture of colors. In Chapter 4, lesson 1 of The Earth System Unit the students experience a teacher led discussion, then a simulation, an hand-on activity, and finally a student to student discussion. There is an abundance of opportunity for students to engage in discussion about the science. There is a lot of chance for students to write their thinking in the Investigation Notebook and to draw their

thoughts as well. The questions are given to the students, there is not a lot of student generated questions opportunities.

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
There is a lot of discussion and sharing of ideas in each lesson. The teacher gives students questions to help solicit their thinking about the topic. Ex: "What living things do you think you would find in this ecosystem?, "What do you know about ecosystems?" Students share out their ideas or share with a partner. There are teacher led discussion and student-to-student discussion. After discussion teachers post key concepts on their wall so students can look back on them. There is partner reading where the teacher assigns students certain pages to read together, they discuss what they read and then the class discusses the reading. The expectation that is shown to teachers is that the students are responding using the academic vocabulary. Ex: "Based on what we're reading in Matter

Makes it All Up, what can we say about all organisms? Answer from student: They are all made of matter, which is made of molecules. There is a lot of simulations that the program uses instead of hands-on activities for students to make sense of a phenomena. There are some hands-on activities.

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
On the Amplify website and at the beginning of the teacher manual, they have a section called Science Background that supplies content knowledge for the teacher, as well as preconceptions the students might have about the topic and gives some parameters for what is taught at the grade level and what is not. The, "Getting Ready to Teach" section provides a list of things teachers will need to do in order to teach this unit. At the beginning of each lesson in the lesson guide section there are some general ways to help EL learners and students who need extra support. Through out the lesson they give tips to have students draw instead of write, reassuring anxious students after the preassessment. At the beginning of each lesson there is a lesson overview that lists the anchor phenomena and everyday phenomena being taught. Scripted for teachers. Embedded assessment is pointed out to teachers within the lesson and at the back of the manual telling them what to look for. Gives sentence stems for teachers to use to support struggling students. There is no letters for families explaining what the children are learning. There is one explaining NGSS.

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
On-line the teacher manual can be Spanish or English. There is a multi-language glossary for the students. On the website there is an Espanol button you can push that changes all the writing in the simulations and apps for students into Spanish. There are simulations for the students. You can purchase the investigation notebook in Spanish. There are 4 units with about 22 to 25 lessons in each unit. Each lesson is 60 minutes long. This would be about 264 minutes a week for science. About 5 weeks per unit. There is such bigger portion of the lessons that will require the students to access computers at least 2 to 3 times a week.

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
There are enough materials for 9 groups of students. Some materials are not supplied. For instance, in Chapter 3, Ecosystem Restoration, activity 2 the students will need a hand lens to observe soil. No hand lenses were provided. The terrariums should last for a few years. There is not enough supplies for each individual student to do the investigations. There are meter tapes for measuring. No scales either. According to the kit materials list there should be enough materials for a teacher to teach the kit to 36 students for two years. You will need to call Amplify to order more materials. There are a lot of materials that the teachers are expected to provide like pitchers, a cooler, glass cup, salt, trays, bowls, fans, jars, rocks, etc. A lot needs to be provided by the teacher for each unit.

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
There are different types of reading materials for the units. They all have content-specific academic vocabulary in them. You can find the books on-line in the library section of the website. The books are available in Spanish and English. There is a text-to-speech option for the on-line books. In all of the books the scientists represented come from all over the world. There are picture book style books and more informational text type books. The comprehension questions for the book in the Investigation Notebook vary in complexity. The students give their opinion and write what surprised them for the “Drinking Cleopatra’s Tears” book. For “Water Shortages, Water Solutions”, the students are asked to talk about the water quality where they live. In Patterns of Earth and Sky the artifact the is part of the phenomena is historical.

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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