Evaluator: 31 Grade Level:4th Grade 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 are engaged in a phenomenon for every Investigation, called the anchor phenomenon, within a unit; the phenomena are related and build on one another. For example, in the Environments Unit, investigation 1 has students work with the phennmenon of wive mealworms, isopods, and leaf cutter critters,

investigation twho's phenomenon is water organisms, investigation three's is ecological problem of water levels affecting bird habit, and investigation four's is different plants react and thrive in different environments. These investigation phenomena all relate to back to the Focus or Guiding Question for each investigation. Each anchor phenomenon also has a storyline that is associated with it to provide context.
An example of the storyline from Environment: Investigation Guide Anchor Phenomenon for Investigation 2 is a fourth grader wondering why owls can see to hunt at night if they don't have light after hearing the nocturnal animal hooting at night. This information was found in Environment: Investigation Guide pages ii-iii.
The three dimensions are embedded into each and every unit and multiples are evident in each investigation. According to the Environment: Investigation Guide on page vi EVERY SEP is evident in EVERY unit (Environments, Rocks, Soil, and Landforms, and Energy). Many CCCs are evident in each unit as well; there are 5 CCC for the Environments unit, 6 for Rocks, Soil, and Lanforms, and 4 for Energy.
Engineering Tasks are evident in the Energy and Rocks, Soil, and Landforms units. There is an additional STEM unit that can be purchased, but was not available in the demo mode. The engineering tasks for the Energy unit are embedded into investigation 3; "Students use all the concepts they have learned to engineer a simple telegraph system and communicate using a click code," and investigation 5; "Students use light wave energy to design series and parallel solar cell circuits and observe the effect on the speed of a motor." (page 4 of the investigation guide). In Soils, Rocks, and Landforms unit in investigation 3, engineering components are touched on, "Students are introduced to phenomena that cause rapid changes to Earth's surface: landslides, earthquakes, floods, and volcanoes, and generate ideas that engineers and scientists might use to reduce the impact of these Earth changes", and investigation 4, "The class makes a stepping stone out of concrete and goes on a schoolyard walk to find objects and structures and consider what natural resources were used to construct them."according to page 4 of the investigation guide.

To what extent do the materials support Criterion 1A? Include your reasoning.
FOSS has a strong correlation and use of many CCC and EVERY SEP for each unit. They have different phenomena for each investigation within a unit and are loosely connected to each other. The phenonmena are real world and relevant to 4th graders. They have engineering present in 2 of the 3 units, and these engineering tasks are embedded into the investigation and connect to the phenomenon of the investigation. It is unclear how much the students drive the solution for these engineering problems, but they are applying their content knowledge.

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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
The three dimensions are embedded into each and every unit and multiples are evident in each investigation. According to the Environment: Investigation Guide on page vi EVERY SEP is evident in EVERY unit (Environments, Rocks, Soil, and Landforms, and Energy). Many CCCs are evident in each unit as well; there are 5 CCC for the Environments unit, 6 for Rocks, Soil, and Lanforms, and 4 for Energy. This is referenced in Environments: Investigation Guide page X for all units. In the Environments: Investigation Guide (page 34), there is evidence of ESS domain integrated with the LS domain. There is no ETS domain integrated into this unit however there is evidence of students high levels of student thinking and problem solving' In the Environments: Investigation Guide investigation 2 students control a variable for a mealworm experiment, and in investigation 3

they control a variable and collect data, and lastly in investigation 4 they set up and control and experiment and map the school yard.
Engineering Tasks are evident in the Energy and Rocks, Soil, and Landforms units. There is an additional STEM unit that can be purchased, but was not available in the demo mode. The engineering tasks for the Energy unit are embedded into investigation 3; "Students use all the concepts they have learned to engineer a simple telegraph system and communicate using a click code," and investigation 5; "Students use light wave energy to design series and parallel solar cell circuits and observe the effect on the speed of a motor." (page 4 of the investigation guide). In Soils, Rocks, and Landforms unit in investigation 3, engineering components are touched on, "Students are introduced to phenomena that cause rapid changes to Earth's surface: landslides, earthquakes, floods, and volcanoes, and generate ideas that engineers and scientists might use to reduce the impact of these Earth changes", and investigation 4, "The class makes a stepping stone out of concrete and goes on a schoolyard walk to find objects and structures and consider what natural resources were used to construct them."according to page 4 of the investigation guide.
In Environments: Investigation Guide page vi-vii, the three dimensions performance assessment features are to explain the phenomenon, "what to look for" for assessing student understanding of the phenomenon,, assessesment coding guide for tracking of student understanding, and monitor progress. There is a specific breakdown for the CCC, DCI, and SEP for each investigation on page 48-51.

To what extent do the materials support Criterion 1B? Include your reasoning.
There is a high level of integration between CCC, DCI, and SEPs in the investigations for each unit. These integrations are use multiple CCC, SEP, and DCI for EACH investigation as well as work towards preparation for studentsn to work on performance tasks that are similar. The investigations guide students towards gain content knowledge, practice applying that knowledge to identify and solve problems in context, and then be assessed in a similar manner.

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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
In Environments: Investigation Guide after each investigation there are suggested extensions for math, science/engineering, language, home, and even art. In Environments: Investigation Guide page 48-51 there is a list of ELA standards that are integrated into EACH investigation. For each investigation there are a dozen or so ELA standards in total, that address some for each ELA domain. There is also the 14 page document called, FOSS and Common Core Math that breaksdown all the math integration for each unit. There are fewer math integrations but they are present in Problems of the week, a few in home/school connections and a measurement standard used during a few investigations in two

units. In addition, there is a document titled Science-centered language development; this large document explains much of the pedagogy for the ELA domains for grade levels and special populations and strategies used to aid in sense making and using vocabulary in context.

In Enrvironments: Investigation Guide page 46 in the content sequence sections it explains and shows the coherence for grades kindergarten through middle school specific to the life science domain. It shows, where the 4th grade content and practices fit into the sequence. Addtionallu, In Environments: Investigation Guide Page ix thre is a logical sequence reference preconceptions from grade 1 and future knowledge for grade 5 specific to the environments unit.

Assessment is embedded into each investigation and unit. The units have a survey (pre-test)/posttest assessment, embedded assessments, notes sheets for formative assessment tracking, and a performance assessment checklist to track SEP and CCC performance. Each investigation also includes an investigation check, or I check, which is more of a summative assessment at the end of each investigation to make formative observations before the summative,unit posttest. For example, In Environments: Investigation #1 the students are given a scenario and asked to write down their application of knowledge to explain their problem and their plan to investigate. There are also scenarios that include questions with multiple choice answers, data tables where students have to analyze and draw conclusions, and/or support a claim with evidence.
There is also a portfolio checklist (notebook participation check list) to make formative assessments for eachpart of the investigation.

To what extent do the materials support Criterion 1C? Include your reasoning.
Students have many opportunities to experience, learn, and make sense of content through many hands on experiments. Each part of an investigation builds on itself from previous parts, and investigations within a unit also build on eachother. Science domains are sometimes integrated, however what is more common is that multiple standards from the same domain are integrated in investigation after investigation. There is significant integration of three dimensional learning for every investigation, and engineering is incorporated some of the time. ELA is a large component that is meaningfully integrated to aid in sense-making. This is the only one reviewed that has art integration in several investigations.

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
Assessment is embedded into each investigation and unit. The units have a survey (pre-test)/posttest assessment, embedded assessments, notes sheets for formative assessment tracking, and a performance assessment checklist to track SEP and CCC performance. Each investigation also includes an investigation check, or I check, which is more of a summative assessment at the end of each investigation to make formative observations before the summative,unit posttest. For example, In Environments: Investigation #1 the students are given a scenario and asked to write down their application of knowledge to explain their problem and their plan to investigate. There are also scenarios that include questions with multiple choice answers, data tables where students have to analyze and draw conclusions, and/or support a claim with evidence.

Sample responses are included for an Investigation Check, answer keys snd rubrics for determining number of points for each written response are available in the Coding Guide documents, found under assessment, in the teacher resource section. In this same document on page 1, there is mention of self-assessment activities, but no further information can be found on which activities are self-assessment and there are no formal self-assessments. There is also a portfolio checklist (notebook participation check list) to make formative assessments for eachpart of the investigation.
In the Environments: Investigation Guide on page 2-3 there is a module matrix, that discusses each assessment present in investigations and the unit. There are embedded assessments, benchmark assessments. This is information is elaborated on, on page 339 that the benchmark assessents are the survey/posttest and the investigation checks are summative for every 1-2 weeks, and the notebook entries (graphic organizers, data sheets, questions, etc) are the embedded formative assessments. The performance assessment has is one part of each investigation and is used to assess CCC and SEP. There are also interim assessments that can be used for test preparation for standardized testing.
FOSS Map is the online assessment program where students can assessments online through their student portal and much of it is self graded according to the assessment section of the instructional guide.

To what extent do the materials support Criterion 2A? Include your reasoning.
There are many summative assessment opportunities and options, and there are embedded assessment strategies and options provided for each investigation or broadly suggested strategies. The assessments include many scenario based questions where students have to analyze, problem solve, and apply content knowledge among other CCC or SEP skills. These scenarios are phenomena related and real world scenarios. There are answer keys, student samples, and clear scoring guidance for assessments.

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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
Students engage in 3-5 investigations per unit and these investigations are broken in 2-5 parts. The investigations are hands on where students are making observations of mealworms, isopods, fish, and plants in the Environment unit. In the Energy unit students are working hands on with wires, bulbs, and circuit elements. They are building complex circuits and experiment with conductors, insulators, solar power, and motors. These shared investigation experiments are the beginning foundation of inquiry prior to "teaching" content. Students engage in a focus/guiding question that is related to the phenonmena prior to the inquiry investigation that will guide students learning. The students re-visit this question after the investigation.

The materials that are provided allow for multiple modalities, such as kinesthetic, visual, auditory, and written. There are diagrams, simulations, videos, experiments, and texts.
According to the Investigation Guide for Environments page 10, the components of the "active investigation" are formative assessment, science notebook, science centered language development, reading of science resource book, accessing technology, taking FOSS outdoors, referred to as the learning cycle. On page 25, it explains that collaborative groups are part of the experience for sense making and gives guidance on setting norms for collaborative work and class discussions.

To what extent do the materials support Criterion 2B? Include your reasoning.
The students have access to many engaging, shared invesitgations or experiences that are inquiry based. The students can read, write, draw, manipulate, and get outside with the investigation tasks. Students partipate in a progression of learning by answering the focus question prior to the experience and then revisting the question after the hands on and sense making components occur. The experiences start off basic, such as lighting a bulb and then move towards more complex such as building a parallel or series circuit with a switch and solar panel. This progression provides equitable support for all backgrounds and provided very concrete learning experiences.

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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
On page 25 of the Environments: Investigation Guide, it explains that collaborative groups are part of the experience for sense making and gives guidance on setting norms for collaborative work and class discussions. In the Energy Investigation Guide on pages 120-129 sense making is evident for Investigation #1 part 1 with a class discussions to activate prior knowledge from the focus question, introduce "sense making discussion" after the exploration/inquiry activity, provide formal vocabulary after the inquiry with pictorial or model supports, discuss principles of the science content, participate in class charts, answer the focus question a second time, participate in a group discussion after reading the text and discussing the supplied questions, and lastly

participate in a claims and evidence writing task where students engage in argumentation.

In the Energy unit students are working hands on with wires, bulbs, and circuit elements and progress towards building complex circuits and experiment with conductors, insulators, solar power, and motors. These shared investigation experiments are the beginning foundation of inquiry prior to "teaching" content. Students engage in a focus/guiding question that is related to the phenonmena prior to the inquiry investigation that will guide students learning. The students re-visit this question after the investigation.
According to the document titled Science-centered language development; vocabulary is meant to be taught in context. This large document explains much of the pedagogy for the ELA domains for grade levels and special populations and strategies used to aid in sense making and using vocabulary in context. Page 77 of the Energy Investigations guide, discusses the use of the word wall and on page 120 it provides a teacher note in the sidebar of when to include specific words to word wall, and directs to "say, see it, hear it, write it". The word energy is introduced to word wall in investigation 1 part 1 after students are introduced to the phenomenon of the flashlight and they have peer discussions. Specific vocabulary strategies are included in the EL notes in the sidebar and in the ELA connections sidebar for specific texts.

To what extent do the materials support Criterion 2C? Include your reasoning.
Students have multiple opportunities to engage in collaborative and peer discourse during everyt einvestigation. The students use the student notebook and the assessments to record their thoughts in written form. There are some vocabulary supports in place during the teaching and reading activities. Investigations progress in sophistication in very sequential order and truly start at the most basic level and allow for students to drive the learning more quickly if needed.

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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
According to the Environments Investigation Guide on page xii the there are teacher prep videos, teaching resources, introducgtory vidos, custom Professional development option, and home/school connections. On pages 40-45 there is a section for background knowledge for the unit that is quite extensive, and on pages 82-87 there is more content background knowledge as well as background information relating to the CCC, DCI, and SEPs on pages 88-90,for the teacher for that specific investigation and this pattern continues for each investigation. Lastly, there is a teacher prep video for each investigation on fossweb. There are pedagogical explanations for the unit instructional design on pages 12-20 and detailed pedogogical explanations of active investigation components. The program is very detailed and offers detailed steps and scripted portions. There are sequential order of all tasks within the investigation including reading texts, assessments, etc. The sidebars offer tips for teachers either suggested supports. Connection opportunities or notes, what to look for tips for formative assessment and identifying the SEP and CCCs in the investigation. There are photos of graphic organizers, notebook pages, assessments, and textbook pages that make it easier to identify the many materials.

There is differentiation present with suggested supports as well as broad suggestions for EL and vocabulary supports in the investigation guide for Environments in the Differentiated Instruction for Access and Equity section starting on page 20 in the overview section. There are extension opportunities for each investigation that include math extensions, problems of the week for math, home/school connection, art, language, and sciene/engineering extensions.

To what extent do the materials support Criterion 2D? Include your reasoning.
There is extensive background knowledge provided for the teacher at the unti and investigation level that is quite exemplary. There is a lot of pedogicial explanations for their learning cycle/components. The format is clear and sequential but is overwhelming at first with the amount of background knowledge, preparation, and lesson components. Once the parts of the lessons are located there are still quite lengthy and there is a fair amount of preparation required for the teacher in terms of equipment, copies, and content preparation. There are a lot of suggestions for extensions and there are fewer explicit supports for struggling learners, but that is partially because their embedded strategies are strategies that work well with all learners and provide a lot of supports innately. The pace of the investigation parts can vary depending on the needs of the classroom population which means that it does meet the needs of a broad group of learners with a rigorous program offered for both sides of the spectrum. There are supports and extensions for the families so that families can build on what is taught in class and be a part of the learning.

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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
There are full materials in both Spanish and English. They differ in that the Spanish edition is one entire book whereas the English textbooks are broken up by units. Multimedia and technology resources are abundate online. According to the Environments Investigation Guide for investigation 3 part 2 there is an interactive simulation map and for investigation 3 part 3 there is a virtual investigation. There is also a video gallery, such as evident with investigation 1 of Environments where the students watch a video on animal needs, and animal behavior in the rainforest. A second example, from the Environments Investigation Guide on pages 2-3 investigation 1 there are 3 videos, and in investigation 2 that are 2 videos and 2 online activities. There is are also digital versions of an identification guide link and and an insect identification key. Each investigation offers powerpoint and google slides to progress the lesson. The investigation guide for environments on page 68 references that ebooks, an online media library and virtual investigations are all offered online. Graphic organizers in the form of data collection tables, questions, directions, and other resources for the investigations are available for the teacher to copy and are either meant for the student science notebook or are full size sheets. There are not ELA graphic organizers pre-made, but they are referenced and shown in the

investigation guide. Often they are strategies or activities that students can easily replicate in their science notebook.
Students have the ability to each have their own class account for online access; they can take assessments online, they can watch tutorials or videos and simulations, Environments investigation guide page 9.
There are not estimated times for activities, investigation parts, or investigations with the lessons. There is a unit planning guide available that estimates the time for each unit, this document is called FOSS grade-level planning guide-grade 4, pages B2 and B3 state that Soils, Rocks, and Landforms will take about 9 weeks, Energy is about 11 weeks, and Environments is 9 weeks. Page B8 gives an example, of a page from the investigation guide called "at a glance", on this page at the bottom it states that a session is 45-50 minutes long and breaks down the number of total sessions for the one investigation including the time of investigation, assessment, and reading for each investigation; this particular example has 15 sessions at 45 minutes for part 1 of the investigation with this pattern of about 12 sessions per investigation times 4 parts to each investigation times 45 minutes and divided by about 10 weeks, that puts instructional minutes around 215 per week over 30 weeks.

To what extent do the materials support Criterion 3A? Include your reasoning.
Time commitment for instructional minutes seems to be on the high end, especially if utilizing extensions or if students need more time due to complex concepts. Materials are quality for both languages and the science notebook materials are rigrous and numerous. The online resources (print, multimedia, and student assessments) are very good albeit a bit overwhelming to navigate at first, but sorting by lesson helps. The online components could be used for both home and school, and there are special resources/tips for "remote learning" this year.

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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
Textbooks come in sets of 16. Materials come in drawed boxes ranging between 3-6 boxes per unit. There are labels on the front of each drawer with titles, quantities, and items in each drawer. Baggies, boxes, and etc are labeled and have quantities on the container.Almost every single material is supplied, down to tape.

To what extent do the materials support Criterion 3B? Include your reasoning.
Textbooks sets are not enough for the average 4th grade class of 30, two sets would need to be ordered for each class, especially if sharing due to health regulations is not permitted. The hands on materials are usually grouped into sets for small group or partner learning. The textbooks and hands on materials are very sturdy and a strong durability potential. The texts are hard bound and the materials, such as the circuits are plastic boards with separate, components that can be added or removed and replaced individually. The teacher manual is soft covered, hard backed, spiral bound manual; one for each unit and is quite large. The equipment comes in anywhere from 3-6 boxes per unit. They come in drawered boxes with detailed labels on the front with specific items, titles, and quantities in each box. It appears that most of the materials are grouped by investigation, but that since some materials are used repeatedly there are exceptions. Extensive amount of materials are supplied, even down to plasti cups, masking tape, and index cards. There are also word wall cards and safety posters included. Students and/or teachers would need to supply VERY LITTLE with this program; notebook, scissors, pencil, and a glue stick.

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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
According to the investigation guide on page viii, there is an access and equity section that addresses the needs of special circumstances, ethnicities, diverse popultions, EL, poverty, girls, and gifted students. There is a statement about the culturally and linguistically responsive teaching approach the curriculum used and the equity of the science experiences. In the Environments, Investigation guide for investigation 1 module matrix on page 2-3, there is a journal referenced as one of the genres and 4 other informational texts. In the Energy textbook, there is a page on the practices, a txt on engineers, an biographical account of a scientist,historical texts on energy, inventors, and inventions, further experiments for students, a comic strip, a class report, and dozens of other informational texts. The visuals of students in the Energy book appear representative. Comprehension supports are embedded into lesson steps for each text with each investigation part; however the page or graphic organizer is not provided. There are general strategies, such as 3-2-1 reading comprehension strategy in investigation 1 part 1 of Environments.

To what extent do the materials support Criterion 1A? Include your reasoning.
There is a broad range of genres and a wealth of information in the student resource book. This book is available online in full digital form. The texts support the content very specifically and use a lot of academic vocabulary, which have vocabulary supports in the text, including bolding and a glossary. The materials are fairly representative, however, in the example I saw the modern scientist biography was the only one in the book and it was a white female. The other scientist/engineers in the text were historical, such as Edison. There was a clear and apparent focus on Lewis LAttimer the black American inventor that is not credited with his part in the

lightbulb. Questions are present at the end of each text and differ from the suggested comprehsion strategy recommended in the investigation guide, the questions are decent.

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