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.

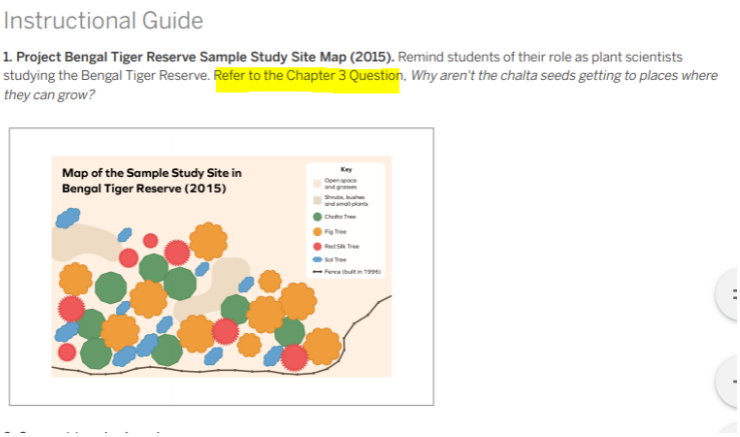
Less of this:	**More** of this:
Phenomena are just for the initial hook.	Phenomena drives the learning.
Phenomena are fun or flashy to engage students.	Phenomena that builds on everyday experiences supports engagement.
Phenomena are brought in after students develop the science ideas so they can apply 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:

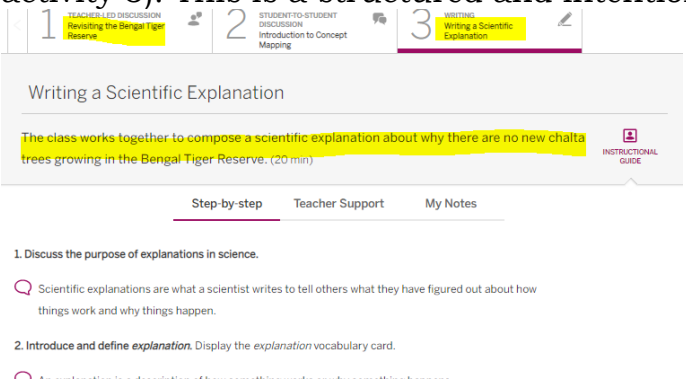
- ◊ Photographs of trash washed up on a beach that leads into a unit on waves in 4th grade physical science unit. (A first-hand experience, video, photograph or data set to start a learning sequence that becomes the "why" for further study grounded in everyday student experiences.)
- ◊ A time lapse video 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
-- The grade 2 unit "Plant and Animal Relationships" uses the anchoring phenomenon, "What is happening to the chalta trees in the Bengal Tiger Reserve?" to drive instruction across the entire unit.

--Unit phenomenon is presented through photographs and story telling (Chapter 1, lesson 1). Students engage in observation and discussion of the phenomenon.
--Within this unit, “chapter phenomena” are used to scaffold the unit phenomenon and revise understanding throughout the unit. For example, the phenomenon used in chapter 3 is “Why aren’t the chalta seeds getting to places where they can grow?”. This will lead students to understand that the elephant disperse the chalta seeds through their droppings and will provide evidence to the anchoring phenomenon of “What is happening to the chalta trees in the Bengal Tiger Reserve?”.
--Further, some lessons contain an investigative phenomenon. Within chapter 3, lesson 2 (3.2) focuses on “Seeds can get to new places in a habitat”.
--Throughout each lesson, educators are prompted to refer back to the phenomenon of the unit or chapter. For example, in lesson 3.2 (activity 1) it asks teachers to “Refer to the Chapter 3 Question. Why aren’t the chalta…” (p. 358) See evidence below:



--Each chapter ends with a culminating lesson that answers the chapter phenomenon. For example, the last lesson in chapter 1 concludes by having students write a scientific explanation to answer the chapter 1 question about why no new chalta trees are growing in the Bengal Tiger Reserve (lesson 1.7, activity 3). This is a structured and intentional conclusion. See evidence below.



--Further, the unit ends by answering the unit phenomenon, coming full circle. This is done through a unit assessment in lesson 4.4 where students work with a digital app and complete habitat diagrams.

--Each anchor phenomenon centers around a real-world, relatable problem. For example, the unit “Plant and Animal Relationships” focuses on “What is happening to the chalta trees in the Bengal Tiger Reserve?”. The unit “Changing Landforms” uses, “Why is the edge of the cliff closer to the flagpole than it used to be?” and unit “Properties of Materials” uses, “How can we design a glue mixture that is better than what the school uses now?”.

To what extent do the materials support Criterion 1A? Include your reasoning.
The materials support Criterion 1A to a high extent. All the science instruction is driven by phenomena which includes anchoring or unit phenomena, chapter phenomena, and investigative phenomena. Lesson plans and teacher support present these phenomena clearly and continuously refer back to them. They are explicit and very easy to find and are in no way hidden or ambiguous. Further, within instruction, educators are prompted to refer back to the phenomenon throughout the lessons/activities, making it explicit to students and allowing the phenomenon to drive further instruction. Also, the materials include culminating discussions and activities to answer the phenomena presented throughout the unit. This occurs on the chapter level through scientific explanations and the unit level through an end of unit assessment. The use of these culminating tasks make it clear to both teachers and students that learning is focused and driven by phenomena.

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.

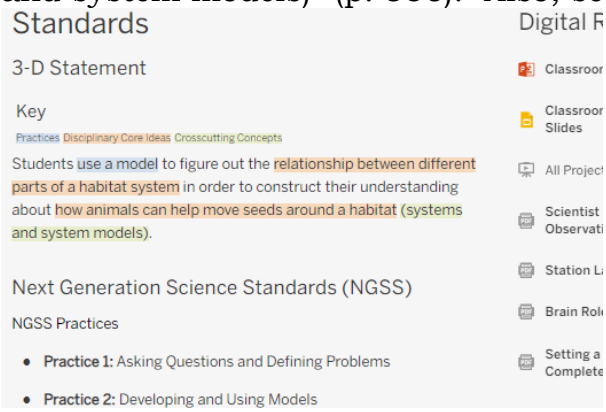
Less of this:	**More** of this:
Students only engage in a single practice element in a lesson.	The lesson helps students use and develop multiple practice elements.
Lessons teach the dimensions separately or only address them at the general level.	Lessons integrate grade-appropriate elements for each 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
*All evidence refers to the grade 2 unit "Plant and Animal Relationships" --In lesson 1.3 students conduct an investigation where they observe and record the type and number of plants in a sample study site on their school grounds. --In lesson 1.6 students conduct an investigation to see the effects of sunlight and water on seeds. Students measure and record data of the plant growth they observe. --In lesson 3.3 students use models of animal droppings to investigate how seeds can be dispersed by animals. --In lesson 3.2 students use models of the yummyberry and sweetpink fruits to explore the different parts of the fruit and the connection to seeds. --SEPs are made explicit to students throughout the lessons. For example, lesson 3.2 makes the practice of developing and using models clear. Within the lesson, it

explains “Sometimes scientists can’t investigate the actual place they are studying. For example, we can’t go to the Bengal Tiger Reserve to see how animals move seeds. What else could we do to investigate? [We can make a model.] Remember that a model is something scientists make to answer questions about the real world. Since we can’t observe a habitat up close, we are going to pretend that our classroom is a habitat and investigate how animals help seeds get to new places here. We will complete Part 1 of our model today.”
--Each lesson includes a 3-D statement that identifies the DCI, SEP, and CCC addressed in the lesson. These statements are color-coded and very accessible to educators. For example, in the grade 2 unit “Plant and Animal Relationships” lesson 3.2 provides the 3-D statement of, “Students use a model to figure out the relationship between different parts of a habitat system in order to construct their understanding about how animals can help move seeds around a habitat (systems and system models)” (p. 356). Also, see evidence below.



--All 3-D statements can be found listed in order of lesson in the “Teacher References” (p. 558-561).
--In lessons 4.2 and 4.3 students use paper, cotton, and paperclips to build models of seeds. They then plan and conduct experiments with these seeds to explore the idea of seed dispersal by wind.
--In the teacher resources titled, “Science Background, Planning for the Unit” the focal practices are explicitly identified for the grade 2 unit “Plant and Animal Relationships” (p. 26).
--CCCs and SEPs are clearly explained in the “Teacher Support: Background” portion of each lesson. In lesson 1.3 it includes, “Background Crosscutting Concept: What Is Meant by Scale, Proportion, and Quantity?” and goes on to explain in depth the CCC of the lesson.

To what extent do the materials support Criterion 1B? Include your reasoning.
The materials support Criterion 1B “Integrating the Three Dimensions” to a high extent. Every lesson identifies the DCI, SEP, and CCC to be addressed. This is done both within the teacher lesson materials and the instruction provided to students. Within the teacher lesson materials, the 3-D statement is included for every lesson and clearly lists each of the three dimensions. This statement is color-coded and extremely clear to the educator. Further, extensive support and

explanation of the targeted dimension is included. The materials are very thorough in this sense as they explain what the specific CCC, for example, means as well as how it specifically relates to the lesson. This makes the 3-dimensions not just present in the lesson but explicitly stated for the educator. This is important because not only are all 3 dimensions included in the lesson but they are very clear to the teacher. This allows educators to be fully aware of the dimensions as they teach and gives them the foresight to recognize them within their teaching and refer to them as students engage with each dimension.

The materials also support Criterion 1B to a large extent because they are present in instruction. The learning activities include hands-on opportunities such as planning and conducting experiments, making observations and asking questions, analyzing data and patterns, measuring and recording data, and using models to engage with the content. Most lessons include first-hand experiences. All lessons include discussion and written components. Further, the DCIs, CCCs, and SEPs are referred to throughout instruction. This is important because students are made aware of not only the content but also the practices and crosscutting concepts they are engaging with. This is done through explicit dialogue or scripts provided in the lesson plans (as seen in the evidence from lesson 3.2 above).

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
--Unit Map is provided for each unit which states the phenomenon for the unit and for each chapter and how they connect. --Unit Map is organized into two paragraphs for each chapter of the unit which states what students are learning and also how they are learning it. --Lessons within chapters refer and build upon each other. For example, in the grade 2 unit "Plant and Animal Relationships" lessons 3.1 and 3.5 build on each other. In lesson 3.1 students take on the role of animals and hide seeds around the classroom. In lesson 3.5 students are tasked with finding the same seeds they had hidden, exploring the idea of seed dispersal by animal.

--Lessons 1.4 and 3.4 build on each other. In lesson 1.4 students are introduced to the Broadleaf Forest habitat and read to gain information on the plants and animals that live there. In lesson 3.4 students create and use diagrams of the Broadleaf Forest habitat to explore the relationship of the chalta fruit tree and elephants. These lessons, though taught far apart, are designed to build on each other as student revise their ideas about the unit phenomenon.
--Grade 2 unit "Plant and Animal Relationships" consists of 4 chapters that build on each other to revise ideas about the unit phenomenon. In chapter 1, students explore the needs of plants (sunlight and water). In chapter 2, students use their understanding of the needs of plants to explore how plants meet their needs (plant parts, location of plant). In chapter 3, students explore how seeds can be dispersed by animals (specifically their droppings) to provide opportunities for them to meet their needs. And in chapter 4, students explore other seed designs that are dispersed by wind.
--Self-assessments titled "Check Your Understanding" are placed at the end of each chapter. They require students to reflect on their learning in relation to the unit/anchoring phenomenon. This constantly ties chapter phenomenon to the anchoring phenomenon which makes the connection explicit to students.
--Reading and writing are used extensively throughout the chapters of each lesson. For example, in lessons 1.1, 1.2, and 1.4 to primary mode of student learning is "literacy inquiry" where students engage with an informative book to gain information. In lesson 1.2 students read "My Nature Notebook" and in lesson 1.4 students read "Handbook of Habitats".

To what extent do the materials support Criterion 1C? Include your reasoning.
The materials support Criterion 1C "Coherence" to a very high extent. The learning experiences are extremely coherent and progress in a logical sequence. Each lesson is built off the one before. This can be seen throughout the unit and specific examples are included above. Connections between lessons, especially when those lessons are present in different chapters of the unit, show the purposeful learning trajectory of the program. Examples of these connections can be seen in the evidence of lessons 1.4 and 3.4 as well as lessons 3.1. and 3.5. Through connections such as these, it is evident that the activities students are engaging with have clear relevance to the targeted dimensions of the unit. Further each chapter is built from the one before. The chapter phenomenon act as stepping stones to the understanding of the anchoring phenomenon of the unit. As seen in the evidence above, each chapter is part of a clear learning trajectory. The application of ELA is strong throughout the program. Students are constantly engaging with text including informative books written specifically for the unit, PowerPoint presentations, and worksheets. The integration of ELA skills and standards is done very intentionally and pairs well with the first-hand science inquiry of the program. Further, the writing portions of the programs are very strong and promote a healthy and positive use of argumentation with science. The claim, evidence, reasoning structure is used well and scaffolded for use in a second grade classroom.

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
--Four main types of assessment are used: Pre-Unit assessments, On-the-Fly assessments, Critical Juncture assessments, and Unit assessments. --All assessments and the DCIs, SEPs, and CCCs addressed can be found in the "Teacher References: Assessment System" on page 562-571. --In grade 2 unit "Plant and Animal Relationships" On-the-Fly assessments are provided for lessons 1.2,1.4, 1.5, and 1.6. These assessments prompt teachers for what to look for from student discussion in class. Teachers are responsible for finding their own system to record student understanding (a system was not seen in the program) --The formative "On-the-Fly" assessment for lesson 1.4 is "As students discuss, circulate and listen for whether they notice differences and similarities among different habitats".

--Possible student responses are provided for these on the digital teachers' guide. An example from lesson 1.5 is show below.

Step-by-step | Teacher Support | Possible Responses | My Notes

Investigation Notebook

New Plant Growth (page 13)

Order of strawberry plant images: seed, sprout, plant without flowers, plant with flowers, plant with fruit

--Typically only one "Critical Juncture" assessment is given at the end of each chapter. For example, the formative "Critical Juncture" assessment for chapter 1 is "Students use this science vocabulary to complete a written response to two prompts about how plants grow." (Lesson 1.7).
--End of the Unit assessments include all 3 dimensions. It is performance based and allows students to use their knowledge of SEPs to produce a product to demonstrate their understanding of the DCIs and CCCs. For example, the unit assessment of "Plant and Animal Relationships" is "Students work with a digital app and then complete habitat diagrams, serves as the End-of-Unit Assessment" (Lesson 4.4).
--Students are required to categorize seeds using a digital app, make observations and conclusions based on the data they collect, and develop a model of a habitat by annotating a diagram.
--An assessment guide for end-of-unit assessments is provided to teachers that includes a summary of the task, standards assessed, rubrics to score student work, and student work samples. This is a separate document and can be found on the digital teachers' guide of the last lesson of the unit (Lesson 4.4 for the unit "Plant and Animal Relationships"). See evidence below.

Assessment Guide: Assessing Students' End-of-Unit Diagrams About Explaining the Plants in a Habitat

This End-of-Unit Assessment is an opportunity for students to show their growth over the course of the unit. See the 3-D Assessment Objectives (under Printable Resources) for a summary of how summative and formative assessments across the unit, grade and grade band reveal student knowledge and use of the three dimensions to support progress toward the focal Performance Expectations for this unit.

Explanation is an important practice in science—explanations are the accounts that scientists construct for the things that we can observe in the natural world. There are three core criteria for scientific explanations that we use to assess their quality: causal and explanatory, clear and well-organized, and grounded in evidence (described below). To support students' understanding of the criteria by which they will be evaluated, the projection (in Lessons 1.7, 2.5, and 3.6) and

--Self-assessments are included as an option throughout the unit. For example in Unit 1 "Plant and Animal Relationships", a "Check Your Understanding" page is

included in the investigative notebook at the end of each chapter. Students check their understanding in relation to the unit anchoring phenomenon (p. 22, 37, 56, 72).

To what extent do the materials support Criterion 2A? Include your reasoning.
The materials support Criterion 2A to a moderate extent. The End-of-Unit provides a comprehensive task where students are required to apply all three dimensions of learning to complete. This assessment is reflective of phenomenon based teaching and requires students to engage with the content in a variety of formats. This provides a more comprehensive look at student understanding. Further, a complete rubric with possible student responses is provided to make evaluating student understanding more clear. The formative assessments provided by the program are very informal and require a lot of student watching. Although the program does provide a focus for teachers, it may be difficult to observe 30 plus students within the lesson time and record student understanding on a checklist or other recording system. These systems are also not provided by the program. Opportunities to evaluate short written responses are much more manageable by the teacher rather than just verbal responses. When formative assessments are intended to be written, possible student responses are provided by the program making it clear to the educator what to look for in student thinking. Overall, the pre and post unit assessments are comprehensive but the formative assessments are lacking.

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
*All evidence refers to the grade 2 unit "Plant and Animal Relationships" --In lesson 1.3, students first investigate a sample study site to observe the plants present. This is done by defining a site on their school grounds (grassy area, garden, native habitat, etc.) with string and then observing and recording the type and number of plants within the defined study site. Students engage with this first-hand experience before analyzing maps of the study site used for the unit phenomenon in the Bengal Tiger Reserve. --In lesson 1.6 students conduct an investigation to see the effects of sunlight and water on seeds. Students measure and record data of the plant growth they observe. --In lesson 3.3 students use models of animal droppings to investigate how seeds can be dispersed by animals.

--In lesson 3.2 students use models of the yummyberry and sweetpink fruits to explore the different parts of the fruit and the connection to seeds.
--In lessons 4.2 and 4.3 students use paper, cotton, and paperclips to build models of seeds. They then plan and conduct experiments with these seeds to explore the idea of seed dispersal by wind.
--Four student apps are provided for students to engage with a computer model related to seed dispersal and plant growth. Three of the 4 apps are for instructional uses and the last is used for the end-of-unit assessment. The lessons the apps support are lessons 2.4 and 2.5.
--Lessons provide students will multiple modalities to access the content. Further, every lesson includes a "multimodal instruction" section in the lesson overview. This section highlights the type of modalities used in the lesson. See evidence below.

> Multimodal instruction. This lesson includes an outdoor investigation, structured discussion, and the use of photographs and other visuals. Multimodal instruction provides students with many opportunities to make sense of concepts and provides access points for different types of learners. Students record their observations of a sample study site around their school, discuss their findings as a class, and then analyze a map of the fictional Bengal Tiger Reserve. This combination of activities helps students consider the diversity of plants in a habitat as they engage in the practice of carrying out investigations.

To what extent do the materials support Criterion 2B? Include your reasoning.
The materials support Criterion 2B "Instructional Experiences" to a high extent. Students are given many opportunities to have first-hand experiences and develop understanding by doing. The experiences are relevant to the standards and are focused on the learning outcomes of the grade-level. The first-hand experiences are also developmentally appropriate for second grade and provide students with teacher support/scaffolding when needed. This program is strongly supported by "literacy inquiry". About 41% lessons of the grade 2 unit "Plants and Animal Relationships" has a strong reading component. Students are provided with various opportunities to engage with the text which ranges from teacher read-aloud, partner read, and group work. Students do have the opportunity to access the content through student apps where they can explore seed dispersal and plant growth in three different habitats with varying resources to meet plant needs. This provides an interactive tool for students to engage with content but is relatively limited in respect with the overall amount of lessons. The interactive apps support 2 of the 22 lessons. Further, the program lacks video resources. Lessons do not utilize video media to present or reinforce content. The main modes of learning include hands-on experiences (45%), observations of pictures and visuals, reading (41%), writing, speaking, and listening, and application of math skills.

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
--Partner, group, and whole class discussion is incorporated throughout each lesson. For example in lesson 3.2 of "Plant and Animal Relationships" students engage with a variety of discussion in activity 4. They first discussion their measurement and data whole-class. Then work in groups to record their data and measurements. Next, discuss whole-class. Last, discuss with partners before sharing out whole-class. --A variety of guiding questions are provided throughout the lesson and activities. For example, lesson 3.2, activity 4 provides five quality questions to guide discussion. An example of two of those questions are provided below.

1. Return to the purpose for investigating. Refer to the Setting a Purpose chart.

Our purpose for investigating today was to figure out how animals help yummyberry and sweetpink seeds get to a good place to grow.

What did we discover about how yummyberry seeds get to a good place to grow?

What did we discover about how sweetpink seeds get to a good place to grow?

Have students turn and talk to a partner. Then, ask volunteers to share out. Students should mention that yummyberry seeds get to a good place to grow when strongbills eat the fruit and leave the seeds in droppings at a good place to grow, and that sweetpink seeds get to a good place to grow when strongbills or flitterbirds eat the fruit and leave the seeds in droppings at a good place to grow.

--The unit "Plant and Animal Relationships" opens with a discussion of images and the story of the Bengal Tiger Reserve. Initial students ideas are solicited and drive instruction. Within the materials it specifically states "All student ideas accepted". This structure of student led discussion which refines ideas over time is established in the first lesson and continues throughout the unit.
--The last lesson of each chapter provides students an opportunity to write scientific explanations to justify their answer to the chapter phenomenon. For example in chapter 3.6 students conclude by writing a scientific explanation to answer why the chalta seeds in the Bengal Tiger Reserve are not getting to places where they can grow. Writing support is provided for students in the form of sentence frames. See evidence below.

Question: Why aren't the chalta seeds getting to places where they can grow?

Topic sentence:

The chalta seeds are not getting to places where they can grow **because**

_____

_____.

Supporting ideas:

The chalta trees depend on _____

to _____.

_____

--Vocabulary is introduced within context. For example, in lesson 1.3, the work "observe" is introduced during the third activitiy of the lesson, after students have observed the sample study sites. See evidence below.

Point out that it can be helpful to observe more than one sample study site.

3. Discuss *observe*.

We just went outside to observe plants in our sample study sites. *Observe* means to use any of the five senses to gather information about something.

Let students know they will continue to make observations throughout the unit.

--Further, the academic definition is also provided for teachers and an explanation of teaching vocabulary within context is described in the teacher

references. For example, lesson 1.1 provides rationale to teachers. See evidence below.

Lesson 1.1
Activity 1

Plant and Animal Relationships
Lesson Guides

Rationale

Literacy Note: Teaching Science Vocabulary in Context
To know a word is to know more than just its definition. Sophisticated word knowledge involves an understanding of how words relate to other words and how words are used in context. The vocabulary words for this unit were strategically selected to support students' learning of science concepts and their understanding of the practices of science. Throughout the unit, words are usually introduced after students have had multiple opportunities to hear and see the words in context. Students will be exposed to unit vocabulary words many times, in many ways, to help them develop flexible word knowledge.

To what extent do the materials support Criterion 2C? Include your reasoning.
The materials support Criterion 2C "Sense Making" to a high extent. Instruction is student led and discussions with high quality questions are used to revise and advance learning. Further student writing is used to construct scientific arguments and is scaffolded and supported with language supports such as sentence frames. Vocabulary is also highly supported through strategies such as introduction through content, visual vocabulary cards, use of academic vocabulary in informative texts, and support through discussions.

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-Fly Assessments have support of teachers called "Look For", "Now What?", etc. This provides the next steps for teachers after the formative assessment. See evidence below from lesson 1.4 of grade 2 unit "Plant and Animal Relationships". Embedded Formative Assessment **On-the-Fly Assessment 2: Habitat Diversity** **Look for:** As students talk with their partner about the discussion question, circulate and listen for how they are making sense of habitat diversity. Do students notice that different habitats have different plants and animals? **Now what?** If students have trouble noticing the differences among different habitats, give them a few additional minutes to flip through *Handbook of Habitats*. Ask them to consider how the plants and animals in the habitat they chose are different from the plants and animals in other habitats. Have pairs discuss what they notice about the range of plants and animals in different habitats. Encourage students to notice specific features of different plants and animals, such as their color, size, and shape. **NGSS connection:** This formative assessment reveals student knowledge and use of Disciplinary Core Idea LS4.D: Biodiversity and Humans. --Every lesson includes an overview of the lesson and summary of all activities within the lesson called "Lesson at a Glance". --Every "Lesson at a Glance" includes an icon next to each activity that clearly shows what students are doing. See evidence below. --Every lesson includes "Materials and Preparation" including how to prepare before, during, and after the lesson. --Every lesson includes "Differentiation" with information about potential challenges, preconceptions specific to the lesson, and specific strategies for EL

students, students who need more support, and students who need more challenge.
--Every lesson includes 3-D statements of the standards, integrated ELA and math standards, and targeted vocabulary.
--Every unit includes an extensive "Science Background" section that includes information on specific topics, vocabulary terms, related preconceptions. For example in the unit "Plant and Animal Relationships", the program provides content information on habitats, plants, leaves, roots, flowers, seeds, etc with appropriate references.
--Support for families is also provided through NGSS explanations and "Home Investigations". For example, in lesson 1.3, an optional home investigation invites students to identify and observe another sample study in their neighborhood or community.
--Vocabulary is introduced within context. For example, in lesson 1.3, the work "observe" is introduced during the third activitiy of the lesson, after students have observed the sample study sites. The academic definition is also provided for teachers and an explanation of teaching vocabulary within context is described in the teacher references. For example lesson 1.1 provides rationale to teachers. See evidence below.

Lesson 1.1
Activity 1

Plant and Animal Relationships
Lesson Guides

Rationale

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To what extent do the materials support Criterion 2D? Include your reasoning.

The materials support Criterion 2D "Teacher Supports" to a very high extent. The materials are extremely thorough and include extensive background information on the DCI's, CCC's, and SEP's. The program also provides assessments, remediations, rubrics, differentiation options, lesson extensions, home connections, and clear and concise unit and lesson overviews with detailed steps and possible scripts. Further, digital resources are easily linked and all materials including printable science notebooks (worksheets), student texts, apps, and much more. This program truly has an extensive support for teachers and makes it accessible to a variety of skill levels among educators. Teachers with great knowledge of the NGSS standards and phenomenon-based teaching have opportunities to extend the program. Teachers with a developing knowledge of NGSS and phenomena also have entry points to access the curriculum and deliver it successfully to students.

Further, the ability to view the resources via the website, pdf version, and printable teacher guides allow teachers to access the curriculum regardless of their preference.

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
--Units include chapters and lessons. In grade 2, there are 3 Units with 22 lessons in each. Each lesson are targeted to be 60 minutes long. --All materials are available in both English and Spanish and the website can toggle between languages with a simple "Espanol" button. By switching to Spanish, all online student materials are available in Spanish including PowerPoint presentations, apps/simulations/games, student worksheets, home investigations, and student books. --Student templates for science notebooks are provided digitally. Teachers can print them or order them preprinted. This resembles more of a packet than science notebook. --Few videos are present but are limited to demonstrations/directions for activities. --"Flextensions" are provided within units that allow teachers opportunities to extend lessons. The grade 2 unit "Plant and Animal Relationships" has one flextension. It relates to lesson 1.3 and investigates sample study sites. It reinforces students' understanding of how scientists study habitats. Students revisit the sample study sites they chose in Lesson 1.3 to measure, count, and record data about the living and nonliving things they observe. Over a number of visits, students collect data to analyze the changes that occur in their sample study sites. The purpose of this lesson is to give students more experience with determining what and how to measure as well as with recording measurements.

--All materials can be accessed digitally or printed (except apps, simulations, and games which are all digital).
--The program has an @Home option that is available and being further developed full distance learning.

To what extent do the materials support Criterion 3A? Include your reasoning.
The materials support Criterion 3A to a high extent. The units are complete and can be extended with flextensions or expanded based on teacher/classroom needs. The materials are accessible in both English and Spanish and are easily switched between languages. There is a plethora of materials for student and teacher use including student templates for science notebooks (worksheets), PowerPoint presentations for each lesson, projectable images for each lesson, apps (computer models) to support learning, reading material accessed both online in a user friendly format and in print, vocabulary cards, and more. The materials are lacking in two areas. One area is video media. There were NO videos available for the grade 2 unit “Plant and Animal Relationships” that presented or reinforced the content. The second area was the graphic organizer and templates. These resembled more of a packet of worksheets rather than a support for genuine student-created science notebooks.

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
--Materials are meant for two classes of 36 students, so tons of materials are available. All materials are needed except common materials found in the classroom. --Some common materials must be provided by the classroom/school such as tape, glue, paper, plastic zip bags, microwave, etc. This is clearly listed at the beginning of the unit under "Materials and Preparation" and is labels as "Items Provided by the Teacher" or "Items provided in the _____ Kit". --18 student books are included for each unit (5 books per unit x 3 units). They are well made (bound by staples) and will last many years. --Student investigative notebooks are included for each student. They are sturdy and will last the unit. Clear and organized pages (black and white). Not too many pages required for each lesson (1-3 pages). Very structured for student writing and comprehension. --Posters and word cards are intentional. Phenomena is printed large for all chapters and units. --Words cards and posters students will use are made from glossy cardstock and will last many years. For example, in the unit "Plants and Animal Relationships" the Bengal Tiger Reserve maps are clear, colorful, large, and made of sturdy cardstock. --High quality materials/brands are used. For example in the unit "Plants and Animal Relationships" students use spoons and tongs as "beaks". They spoons and tongs provided are made of thick plastic that will be very durable for 2nd graders. Also, Honeywell fan, Solo cups, Ziplock containers are a few examples of the higher quality brands included. --Measurement tools such as tape measures are included. --Thousands of seeds/beans are included and clearly labeled which will be more than enough for many years of work.

To what extent do the materials support Criterion 3B? Include your reasoning.
The materials support Criterion 3B "Science Equipment" to a very high extent.

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
--Texts are provided in a user-friendly online format and in print. --18 books are provided per kit (5 books x 3 units) but can be accessed digitally. --In the grade 2 unit “Plant and Animal Relationships”, five student books are available in both English and Spanish. They include “A Plant is a System”, “Habitat Scientist”, “Handbook of Habitats”, “Investigating Seeds”, and “My Nature Notebook”. --Student books are presented in a “book format” rather than a “textbook” format. --Material has appropriate reading levels and engaging illustrations/photographs. --Material in this unit highlights a biologist named John Harte, a Caucasian American man. --Student text in unit “Properties of Materials” highlights food engineer Ambrose Lee, an Asian American man. --Student text in unit “Changing Landforms” highlights water scientist Chris Cianfrani, a Caucasian American woman.

To what extent do the materials support Criterion 1A? Include your reasoning.
The materials support criterion 3C “Reading Materials” to a high extent. The texts provided are extremely relevant to the content and lessons. They have been written specifically for the program. They are at an appropriate reading level and provide engaging illustrations and photographs. Further, vocabulary is incorporated in a genuine way through the context of the informative text. They texts are diverse when people are included in the texts.

Evaluator: 47 Grade Level: Grade 2 Program: Amplify Science

Referenced, adapted and formatted from the following documents:

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BSCS (2017). Guidelines for the Evaluation of Instructional Materials in Science.

BSCS Science Learning (2018). NextGen TIME

MacDonald et al. (2020). *Design Principles for Engaging Multilingual Learners in Three-Dimensional Science* Wisconsin Center for Education Research (WCER) Working Paper No. 2020-1. https://wcer.wisc.edu/docs/working-papers/WCER_Working_Paper_No_2020_1.pdf

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

Washoe County School District Needs Evaluation

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