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

Category 1: Designed for Three-Dimensional Learning

Criterion 1A: Phenomena and Problems

Instructional materials focus on students making sense of phenomena or designing solutions to problems which drives student learning.

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

Examples of Evidence:

- ◊ Photographs of trash washed up on a beach that leads into a unit on waves in 4th grade physical science unit. (A first-hand experience, video, photograph or data set to start a learning sequence that becomes the "why" for further study grounded in everyday student experiences.)
- ◊ A bucket of water is physically explored by students and leads to exploration of properties of matter in 2nd grade.
- ◊ Garbage from the lunchroom is examined to start a unit on matter and how it changes in the 5th grade physical science unit.
- ◊ 3rd grade students explore balloons, aluminum cans, styrofoam beads, and transparent tape to make observations and generate questions about static electricity in the physical science unit, lesson 3.
- ◊ Students address the problem of communicating at a distance without sound following a study of light in the 1st grade physical science unit.

Specific Evidence from Materials
Design of Bring Science Alive! Curriculum is centered around phenomenon. Has an anchor phenomenon for each unit which encourages students to make connections with the world around them. Students then further explore the phenomenon during the PA. Within the anchor are lesson phenomenon (investigative phenomenon used to pique students' interest and drive instruction as well as at the end students use what they've learned to make sense of the phenomenon), as well as local phenomenon where students build a deeper, personal connection to the phenomenon through direct observation. See the Try it! See it! And Research it! Activities which are embedded in every lesson and allow for students to make real-world connections. -Grade 4 Review Guide Page 23 has a phenomenon chart. It has students organize their thoughts around the phenomenon as "Know, Wonder, Learned." I'm always one who likes a good note-taker/thought organizer. - Grade 4 Review Guide Page 24 – Tells us that the phenomenon (for Lesson 2) is: Water waves can be big and fast enough to surf on. This is more for the teacher it seems. When consulting the Science Journal for Unit 4, Lesson 2, page 29 shows us what students are actually interacting with. Students discuss – Have you ever been to the ocean? Did you see people surfing on the waves? After that, they observe a video of water waves and people surfing on them, and then they get to

fill a plastic container and try to make their own waves. From there students engage in thinking about what they already know about waves and ask questions. The anchoring phenomenon for Unit 4 is that people can communicate using sound waves (pg. 394 of the encompassing lesson guide for all 4 units). The progression of units helps students to make sense of this phenomenon. The progression is such that students build understanding by exploring waves, developing a model of patterns of waves and later modeling and acting out properties of amplitude and wavelength, they study wave effect on objects, then use their own bodies to model how earth's crust moves during earthquakes, they then use patterns of sound to communicate about geometry concepts, and finally students design digital devices that send secret messages and determine which device works best.

-The online materials have a plethora of pictures and videos across each lesson to show students to engage them in observing phenomenon. Teachers can also easily supplement if they wish. The phenomenon is engaging and allows for lots of opportunities for students to ask questions.

-There is a unit 4 video about a student who requires hearing aides to get students in to the unit and thinking about the anchoring phenomenon.

- Unit 4 Lesson 1 shows a picture of the wave, then shows a video of the wave, and then has the class engage in doing the wave.

-Unit 4 Lesson 5 shows a picture of a fire truck in motion, then shows a video of an ambulance sound, then has students connect to the sound the school bell makes and what that means, and leads to a brainstorm of what other ways people use sounds to communicate.

-The examples above are indicative of all of the lessons in Unit 4

To what extent do the materials support Criterion 1A? Include your reasoning.
Score of 2-The materials support Criterion 1A, but not as well as FOSS. While we have determined that phenomenon should build off of students' everyday experiences, it is a fact that many students do not have experiences that would allow us to build upon. This is the great thing about phenomenon though, because we can present these experiences to our students so that they can then have a shared experience from which to ask questions and start to build understanding. For example, Unit 4 Lesson 2 (Science Journal pg. 29 but also online materials) shows a video of people surfing. If I asked students at my school, in the 4th grade if any of them have ever been surfing, chances are going to be slim that even half have surfed…but that should not discredit this phenomenon. It is possible that a larger number of students have seen people surfing whether in person or on tv, but showing a video to the whole class helps to level the playing field of seeing ocean waves and people surfing on them. The teacher could use the provided video to build upon and show other videos of surfing or ocean waves that may further engage students in asking questions about this particular phenomenon. To take it a step further, this curriculum has students fill a plastic container with water (building off of the same example) and has them making water waves, giving them another opportunity to interact with the concept. The engineering design solution is grade appropriate in that our students today are inundated with different ways to communicate. It is both engaging and relevant for students to act as engineers to design digital devices that send secret messages and through a process of testing out different devices finding which one works best and why. They are engaging in the actual work of real-world scientists and engineers, just with a focus on creating a new method of communication based off of using different types of waves.

Evaluator number: 20Program: TCI Score of 1 = Best; 2 = partial, 3 = Least

Criterion 1B: Integrating the Three-Dimensions

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

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

Examples of Evidence:

- ◊ Students conduct an investigation, including collecting data, with balls and ramps to determine cause and effect relationships of speed and energy in unit 2 lesson 4.
- ◊ Students investigate how to make different looking waves in water and how these waves affect a floating object in the 4th grade physical science unit.
- ◊ 3rd grade students generate, test and refine solutions to keep two moving objects from touching each other by applying ideas learned about magnets in lesson 9.

Specific Evidence from Materials
-Unit 4, Lesson 5, page 94 of the Science Journal: Students make drums to communicate nine geometry terms to each other as part of the progression in making sense of and building understanding toward the phenomenon that people can communicate using sound waves. -Unit 4, Lesosn 6, page 112 of the Science Journal: Students define a problem by investigating sending types of messages. The problem to define – what are the criteria for a successful digital device? What are the constraints? The idea is to test their solutions, refine, update the problem and then plan and build a solution, test it again, etc. -The SEP are not presented linear, but the lessons are designed in a more linear fashion to build upon understanding of the lesson phenomenon to then answer the larger anchor phenomenon at the end of the unit. -Unit 2, Lesson 2, page 29 of the Science Journal: Students have the opportunity to plan an investigation to test – What happens to the energy if a moving object hits a still object? I like that there are supportive measures in place to help students at this age set things up and then consider how to plan it out. If it were MS or HS – I would not offer so many supports. -Unit 2, Lesson 4, page 71 of the Science Journal: Students build circuits to investigate how electric current transfers energy. They then build and solve a puzzle using electric currents. There are multiple ways for students to build this circuit that gives the same result (pg. 211 in the Lesson Guide). -Page 418 in the Lesson Guide is an example of how direct this curriculum shows what SEPs, CCCs, and DCIs are being used and toward what PE. It also lists out connections to the Nature of Science and any Common Core Standards connections.

To what extent do the materials support Criterion 1B? Include your reasoning.

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Score of 2 - In my opinion these two physical science units are all based in inquiry and completely intertwine the three dimensions through the lesson progressions. There are many opportunities for students to connect with the individual lesson phenomenon which stimulates engagement with the SEPs to build knowledge around the DCIs to then form an overarching understanding of the CCC's and they tie it all up by making sense of the anchor phenomenon.

Evaluator number: 20Program: TCI Score of 1 = Best; 2 = partial, 3 = Least

Criterion 1C: Coherence

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

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

Examples of Evidence:

- ◊ 5th grade students are investigating water sources around the Earth and make connections to properties of matter in both the physical science and earth science units and prior learning about weather and climate from 3rd grade.
- ◊ Students apply ELA learning to write a set of directions for conducting an investigation in the earth science unit, lesson 6.
- ◊ Line plots are used to analyze data in unit 4 at the 3rd grade level.

Specific Evidence from Materials
Lesson progression is outlined in all units. The lessons build student understanding as the student works through in a 3D fashion. The understanding is built by engaging students in lesson and local phenomenon. The different experiences students progress through equip them with enough information to understand the anchor phenomenon and ultimately build overall understanding of the Performance Expecation. See page 14 of the Grade 4 Review guide as an example. You can also look at the online materials which show the connections as well. The learning progression is outlined on page 406 of the Unit Lesson Guide where it shows what and when students learned a related concept and what is coming after. There are connections (though I didn't find any explicit yet) to other units in this curriculum as well as to other standards. For example, PE 4-LS1-2 is Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. There is a connection that can be made to Unit 4 in regards to the anchor phenomenon that people can communicate using sound waves. So I might ask students that if people can communicate using sound waves, can animals do the same? How? And try to connect that to 4-LS1-2. Also, I think a connection could be made with Unit 4 to Unit 3 (Earth's Changing Surface) when discussing Earthquakes. PE 4-ESS2-2 could come into play here as well to tie the two units together. Again though, I didn't yet find where this curriculum made the explicit connection for the teacher or students. -The online learning materials provide explicit interdisciplinary connections. -Page 418 in the Lesson Guide is an example of how direct this curriculum shows what SEPs, CCCs, and DCIs are being used and toward what PE. It also lists out connections to the Nature of Science and any Common Core Standards connections.

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To what extent do the materials support Criterion 1C? Include your reasoning.
Score of 1 – I feel like TCI is tied with FOSS in this area. They both do a great job of sequencing and creating connections.

Category 2: Instructional Supports

Criterion 2A: Assessing the Three-Dimensions
Instructional materials support monitoring student progress in all three dimensions.

- Multiple and varied assessments allow students to demonstrate learning in all three dimensions including application of knowledge in performance tasks.
- Formative assessments, including teacher, self and peer assessments, are embedded throughout to inform instruction.
- Assessments are unbiased and elicit direct, observable evidence from all students.
- A phenomena or problem drives tasks, and information from the task is required to complete it.
- Rubrics and scoring guidelines are provided for interpreting student performance including sample student responses.

Examples of Evidence:

◊ As students are engaged in a performance task, there are indicators for teachers to look for and information about possible responses and next steps. This information is embedded in the lesson.
◊ In unit 1, there are two performance assessments, peer feedback throughout, exits slips, a summative assessment, and a prewrite.
◊ Individual student learning is assessed using written work that answers the driving question of the unit. (Earth Science, p. 76)

Specific Evidence from Materials
-Sample rubrics are provided for all performance assessments. These rubrics assess student understanding explicitly within each of the three dimensions. So far I've only found these in the online resources, not in the print materials. For example, click on the Assessments tab on the left side. Use the drop-down to select any Unit or Lesson. I looked at Unit 4, Lesson 5. Above this drop-down menu is an orange box with an I in it. Click it and it will open up a place where you can click on the word Rubrics. It will show the PA rubric for that unit's PA. You can also go to the Text in Notes section and change it to Performance Assessment on the right side and it will allow you to put in online rubric feedback for students.

To what extent do the materials support Criterion 2A? Include your reasoning.
Score of 2-This curriculum mostly meets Criterion 2a. A phenomena drives all assessment tasks, there are rubrics to assess student knowledge on all three dimensions of the task. Formative assessment ideas are given during every lesson. The science notebook prompts assess students' 3D learning during each investigation and provides reflection questions.S I'm not sure the assessments are unbiased. I didn't have enough time to dive into all of them.

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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.

Examples of Evidence:

- ◊ Students develop physical models of a landfill as open and closed systems to observe during the 5th grade garbage unit.
- ◊ Students identify components of garbage disposal in their homes and communities which connects the phenomena that started the unit.
- ◊ Students conduct a first-hand investigation of erosion and deposition using a stream table, observe time-lapse videos of landslides, engage in a virtual investigation, read accounts earth changes by wind and record changes to the playground after a snow event in the 4th grade earth science unit.
- ◊ Students raise trout from eggs in the classroom and make observations over time as part of their study of traits in the life science unit.

Specific Evidence from Materials
-Unit 4, Lesson 5, page 94 of the Science Journal: Students make drums to communicate nine geometry terms to each other as part of the progression in making sense of and building understanding toward the phenomenon that people can communicate using sound waves. -Unit 4, Lesosn 6, page 112 of the Science Journal: Students define a problem by investigating sending types of messages. The problem to define – what are the criteria for a successful digital device? What are the constraints? The idea is to test their solutions, refine, update the problem and then plan and build a solution, test it again, etc. -The SEP are not presented linear, but the lessons are designed in a more linear fashion to build upon understanding of the lesson phenomenon to then answer the larger anchor phenomenon at the end of the unit. -Unit 2, Lesson 2, page 29 of the Science Journal: Students have the opportunity to plan an investigation to test – What happens to the energy if a moving object hits a still object? I like that there are supportive measures in place to help students at this age set things up and then consider how to plan it out. If it were MS or HS – I would not offer so many supports. -Unit 2, Lesson 4, page 71 of the Science Journal: Students build circuits to investigate how electric current transfers energy. They then build and solve a puzzle using electric currents. There are multiple ways for students to build this circuit that gives the same result (pg. 211 in the Lesson Guide).

-Page 418 in the Lesson Guide is an example of how direct this curriculum shows what SEPs, CCCs, and DCIs are being used and toward what PE. It also lists out connections to the Nature of Science and any Common Core Standards connections.

To what extent do the materials support Criterion 2B? Include your reasoning.
Score of 2-I believe that the experiences provided help to provide access to the content for all students. They do engage in direct, shared experiences as noted in the evidence. However, I did not see where activities connect to individual student 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.

Examples of Evidence:

- ◊ 5th grade students develop models of how scents travel that are refined over the course of a three weeks using a combination of visual and written language providing multiple opportunities to develop precise vocabulary in the physical science unit.
- ◊ 3rd grade students answer questions in their notebook individually using pictures and words to explain their initial ideas about how a magnet works and have the opportunity to revise this after discussing with a peer and the whole class in the physical science unit.
- ◊ The teacher facilitates a class discussion using a word wall where kindergarten students share observations with a shoulder partner and the whole group about the kinds of things in their homes to figure out that the things we need come from nature.
- ◊ Suggested sentence frames are included to support oral and written responses when needed with the goal of independence.

Specific Evidence from Materials
-There are language supports in various ways in the online tools. All items are offered in English and Spanish. Students can opt to have the text read to them, and have tools to draw on the slides. They can also add closed captions to the videos. -There are online vocabulary games. -All lessons are about sense-making and can be done at both an individual and group level.

To what extent do the materials support Criterion 2C? Include your reasoning.
Score of 3-I ran out of time reviewing these materials in person so I did not gather enough evidence to really support Criterion 2c.

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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 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
Online tools: -There is a fast track lesson guide for teachers to use or a master lesson guide with extended learning opportunities. -A lesson support dialogue is offered with suggestions. -They include what the learning progressions are for energy prior to 4th grade. -Differentiation ideas are provided for EL, SPED, Advanced. -A tab is included for student preconceptions. -Online resources and ideas are included for enhancing learning either at school or at home. -The online materials have the ability to adjust the reading level. The standard grade level is A, and level B is two grade levels below standard. Stduents can highlight the text, make notes, print, save to Google drive, have the text read to them. They can also press a button that highlights the main ideas. However, most of these features can be turned on or off by student, depending on the students' needs. -There is a "lesson support" button you can click in most parts of each lesson that tells teachers what to prep for and think about. -The online tools offer professional learning opportunities for teachers.

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

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Score of 3 (only because Amplify and FOSS had much more extensive supports). I believe the materials do a decent job supporting Criterion D. If I were in the classroom I would find all of the supports very helpful. The blended learning online model is especially great for students who find themselves excluded for COVID concerns, and in general would provide a great opportunity for a flipped classroom.

Evaluator number: 20Program: TCI Score of 1 = Best; 2 = partial, 3 = Least

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
Online tools: -There is a fast track lesson guide for teachers to use or a master lesson guide with extended learning opportunities. -A lesson support dialogue is offered with suggestions. -They include what the learning progressions are for energy prior to 4th grade. -Differentiation ideas are provided for EL, SPED, Advanced. -A tab is included for student preconceptions. -Online resources and ideas are included for enhancing learning either at school or at home. -The online materials have the ability to adjust the reading level. The standard grade level is A, and level B is two grade levels below standard. Stduents can highlight the text, make notes, print, save to Google drive, have the text read to them. They can also press a button that highlights the main ideas. However, most of these features can be turned on or off by student, depending on the students' needs. -Many graphic organizers are provided for each unit. -Videos, tutorials, and simulations are provided for each unit online. Just go to any unit and you will see that each lesson has them. -One of the units uses a video with a child with a hearing impairment as the phenomena. -There are a variety of names for characters used that span many different cultures, but that's about where the curriculum stops.

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To what extent do the materials support Criterion 3A? Include your reasoning.
Score of 3-Based on the evidence above this curriculum mostly supports Criterion 3A. It lacks in the culturally responsive piece as it did not hit all of the look fors. Other than that, it does a good job providing materials in Spanish and translating text into Spanish for anything that is read online, provides closed captioning for videos, and provides materials digitally and in print.

Evaluator number: 20Program: TCI Score of 1 = Best; 2 = partial, 3 = Least

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 provide for both 4th grade Physical Science units are enough for groups of students. They are items that could be easily replaced or replaced with similar items to create more so that students can work in pairs or individually.

To what extent do the materials support Criterion 3B? Include your reasoning.
Score of 1 – All three curriculum's meet this piece. Plenty of items are provided, supporting Criterion 3B.

Evaluator number: 20Program: TCI Score of 1 = Best; 2 = partial, 3 = Least

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
The materials do a great job supporting reading comprehension by providing online and in print graphic organizers, as well as how the questions are asked. In the online materials, students have access to highlight text, and make the main ideas visible (if the teacher allows this feature to be turned on). I saw white students and teachers and black students and teachers in both units, but I didn't see any other cultures represented. Content vocabulary is supported by providing a vocabulary matching game online, but I think they could've done a better job in both Physical Science units.

To what extent do the materials support Criterion 1A? Include your reasoning.
Score of 3. These materials partially support Criterion 3c. It is lacking in providing diversity of figures to connect to, and could've done a better job with content vocabulary. The materials do a good job of supporting reading comprehension.

Evaluator number: 20Program: TCI Score of 1 = Best; 2 = partial, 3 = Least

Referenced, adapted and formatted from the following documents:

Achieve, Inc. (2016). EQuIP Rubric, Version 3.0.

Achieve, Inc. (2018). Science Task Prescreen.

Achieve, Inc. (2016). Using Phenomena in NGSS-Designed Lessons and Units.

Achieve, Inc. (2017). Primary Evaluation of Essential Criteria (PEEC) for Next Generation Science Standards Instructional Materials Design.

Brennan et al. (2017) *Priority Features of NGSS-Aligned Instructional Materials: Recommendations for Publishers, Reviewers and Educators* [White paper].

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

National Academies of Sciences, Engineering, and Medicine (NASEM) (2017). *Seeing Students Learn Science: Integrating Assessment and Instruction in the Classroom.* Washington, DC: The National Academies Press.

National Research Council (NRC) (2012). *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas.* Washington, DC: The National Academies Press.

NGSS Lead States (2013). *Next Generation Science Standards: For States, By States.* Washington, DC: The National Academies Press.

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.