

TPS STEAM into Science Grade 2

TPS STEAM into Science Grade 2 Executive Summary

Section 1. Science-Related Texas Essential Knowledge and Skills (TEKS) and English Language Proficiency Standards (ELPS) Alignment

Grade	TEKS Student %	TEKS Teacher %	ELPS Student %	ELPS Teacher %
Grade K	100%	100%	100%	100%
Grade 1	100%	100%	100%	100%
Grade 2	100%	100%	100%	100%

Section 2. Instructional Anchor

- The materials are partially designed to strategically and systematically integrate scientific and engineering practices, recurring themes and concepts, and grade-level content as outlined in the TEKS.
- The materials sometimes anchor the learning in phenomena and problems as the key lever for driving learning and student mastery of disciplinary knowledge and skills.

Section 3. Knowledge Coherence

- The materials are designed to build knowledge systematically, coherently, and accurately.
- The materials provide some educative components to support teachers' content and coherence knowledge.

Section 4. Productive Struggle

- The materials provide some opportunities for students to engage in productive struggle through sensemaking that involves reading, writing, thinking, and acting as scientists and engineers.

Section 5. Evidence-Based Reasoning and Communicating

- The materials partially promote students' use of evidence to develop, communicate, and evaluate explanations and solutions.
- The materials provide teacher guidance to support student reasoning and communication skills.

Section 6. Progress Monitoring

- The materials include a variety of TEKS-aligned and developmentally appropriate assessment tools.
- The materials include some guidance that explains how to analyze and respond to data from assessment tools.

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- The assessments are partially clear and easy to understand.

Section 7. Supports for All Learners

- The materials provide guidance on fostering connections between home and school.
- The materials include some listening, reading, writing, and speaking supports to help Emergent Bilinguals meet grade-level science content expectations.
- The materials partially include a variety of research-based instructional methods that appeal to a variety of learning interests and needs.
- The materials include some guidance, scaffolds, supports, and extensions that maximize student learning potential.

Section 8. Implementation Supports

- The materials include year-long plans with practice and review opportunities that support instruction.
- The materials include some classroom implementation support for teachers and administrators.
- The materials provide some implementation guidance to meet variability in program design and scheduling.

Section 9. Design Features

- The visual design of materials is sometimes clear and easy to understand.
- The materials are not designed to engage and support student learning with the integration of digital technology.
- The digital technology or online components are not developmentally and grade-level appropriate and do not provide support for learning.

Section 10. Additional Information

- The publisher submitted the technology, price, professional learning, and additional language supports.

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Indicator 2.1

Materials are designed to strategically and systematically integrate scientific and engineering practices, recurring themes and concepts, and grade-level content as outlined in the TEKS.

1	Materials provide multiple opportunities for students to develop, practice, and demonstrate mastery of grade-level appropriate scientific and engineering practices as outlined in the TEKS.	M
2	Materials provide multiple opportunities to make connections between and within overarching concepts using recurring themes.	PM
3	Materials strategically and systematically develop students' content knowledge and skills as appropriate for the concept and grade level as outlined in the TEKS.	M
4	Materials include sufficient opportunities, as outlined in the TEKS, for students to ask questions and plan and conduct classroom, laboratory, and field investigations and to engage in problem-solving to make connections across disciplines and develop an understanding of science concepts.	M

Partial Meets | Score 2/4

Materials partially meet the criteria for this indicator. Materials are partially designed to strategically and systematically integrate scientific and engineering practices, recurring themes and concepts, and grade-level content as outlined in the TEKS.

Materials provide opportunities for students to develop, practice, and demonstrate mastery of grade-level appropriate scientific and engineering practices as outlined in the TEKS. Materials provide some opportunities to make connections between and within overarching concepts using recurring themes. Materials strategically and systematically develop students' content knowledge and skills as appropriate for the concept and grade level as outlined in the TEKS. Materials include opportunities, as outlined in the TEKS, for students to ask questions, plan and conduct classroom, laboratory, and field investigations, and engage in problem-solving to make connections across disciplines and develop an understanding of science concepts.

Evidence includes, but is not limited to:

Materials provide opportunities for students to develop, practice, and demonstrate mastery of grade level appropriate scientific and engineering practices as outlined in the TEKS.

- Materials provide opportunities to develop, practice, and show mastery of grade-level appropriate scientific practices. For example, in the *Teacher Textbook*, the lesson is about weather forecasting severe weather storms. Students will conduct a scientific investigation, and the teacher will show the steps of the investigation. Students are to follow the example and then write their own.
- Materials provide multiple opportunities for practice and mastery of engineering practices. For example, a Science is a Verb (SIAV) and a lesson in the *Teacher Textbook* provide teacher guidance as students evaluate how to group objects using inquiry. The questions start students on their inquiry journey using and applying their scientific and engineering practice skills. Also,

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students use scientific practices to complete mini-experiments, create a risk assessment, and identify safety hazards. In the *STEAM Activity Guide - Grade 2 Teacher Edition*, students study scientific practices and focus on questions, answers, and problem-solving. In the STEM project, Window Shopping, students follow the DAPIC process, which is described in the teacher guide. Students Define, Assess, Plan, Implement, and Communicate. In this learning cycle, students experience the scientific inquiry method as they explore how light and colors interact. Careful attention to recording data is important. They also work on the physical properties of paper structures, magnets to control movement, and marbles rolling and sliding down ramps. They then apply their knowledge as they design and build a window display. Students continue to experiment with properties in the art projects that follow and, within those projects, apply scientific practices. Students create an experiment to show that sound, light, or heat energy, when increased or decreased, can change the appearance of an object.

Materials provide multiple opportunities to make connections between and within overarching concepts using recurring themes.

- Materials include opportunities for students to make connections within, but rarely between, overarching concepts using recurring themes. Most lessons provide connections to the recurring themes within concepts. The Earth's Changing Surface lesson, 10A - TRAD, in the *Teacher Textbook - Grade 2 Science* provides instruction on how forces of weathering, erosion, and deposition can change the Earth's surface. However, there is no connection made between concepts about factors that cause change, such as how the presence or absence of thermal energy can cause changes to matter.
- Materials include opportunities for students to make connections within, but rarely between, overarching concepts using recurring themes. Most lessons provide connections to the recurring themes within concepts. Lesson 7A, B SIAV in the *Teacher Textbook - Grade 2 Science* explores cause and effect relationships. However, there is no connection made between concepts about cause and effect relationships, such as the force of wind and water can affect earth materials.
- The materials provide some connections between and within overarching concepts through the narrative texts in the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*; however, while the text weaves stories of different science disciplines together, this doesn't equate to an opportunity because the direct connections between the concepts are not articulated fully by the materials, either by questions posed to students, or guidance provided to the teacher to make the connections.
- The materials sometimes provide opportunities to make connections between and within overarching concepts using recurring themes. In the *STEAM Activity Guide - Grade 2 Teacher Edition*, Lesson 7A - AS - Does My Strength Affect The Push Or Pull Of An Object? the materials provide a discussion activity that states, "In this activity, you have looked at how things can cause objects to change. Now, with your teacher and classmates, discuss how factors can cause plants or animals, and systems to change." This connects within and between overarching themes but is a rare occurrence in the materials and is only found in the resource teachers are not instructed to use until Step 3, according to the publisher's instructions for implementing the program. This lesson connects across grade levels as well since it is the exact same lesson as in the *STEAM Activity Guide - Grade 2 Teacher Edition*.

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Materials strategically and systematically develop students' content knowledge and skills as appropriate for the concept and grade level as outlined in the TEKS.

- Materials provide strategic guidance and connections to the grade-level TEKS. For example, in the Teacher Textbook, the TEKS are at the top of the page, the activities listed follow those TEKS, and they are appropriate for the content and grade level.
- Materials provide guidance to develop students' content knowledge. The *Learn By Doing Teacher's Guide* includes an Essential Content Guide that shows how the program is structured and gives an overview of the sequence of units, showing how the program systematically presents content and concepts for students to make connections between content areas throughout the program. A Scope and Sequence document that illustrates how content builds within each grade, with scaffolding information in each *Teacher Textbook* lesson plan and prior knowledge in each lesson plan. In the *Teacher Textbook*, the lessons build on having students engage their prior knowledge for the new lesson. For example, the lesson Making Changes helps build student background knowledge before moving on to the lesson Combining Materials, and then moving on to the lesson Things Can Be Done to Materials to Change Their Physical Properties.
- Materials provide an explanation of the rationale for the sequence of units. The Teacher Program Guide states, "Our team utilizes a by standard, strand and/or learning cycle structure which engages students in active interaction with the content." For the *Learn by Doing STEAM Reader Books*, there are two documents to refer to the Pedagogy behind the approach: Teaching Pedagogy – Storytelling and STEAM, and Scope and Sequence. These documents explain the background for the pedagogy behind the *Learn by Doing STEAM Activity & Reader Books* and how the book content is structured.

Materials include some opportunities, as outlined in the TEKS, for students to ask questions, plan and conduct classroom, laboratory, and field investigations, engage in problem solving to make connections across disciplines, and develop an understanding of science concepts.

- Materials provide opportunities for questioning and for students to plan and conduct classroom, laboratory, and field investigations. For example, the *STEAM Activity Guide* includes a Scientific and Engineering Practice Project that allows students to plan and conduct an open-ended engineering project. In the *Learn By Doing STEAM Activity Reader Book*, there are opportunities for students to ask questions while investigating the "Apollo Mission Research Project," as students are asked to create questions they want to discover.
- Materials provide suggestions on problem-solving to make connections. For example, the *Learn by Doing STEAM Activity Reader Book*, Activity 1, Rosa's Scores, could be considered as making connections across disciplines but not relating it to the science; it is critique and comprehension. There are financial literacy, money, and place value connection activities. In the *STEAM Activity Guide*, there are ELA and Math connections provided. Students should be able to use the data collected to propose a solution to the problem "How can I make the pattern formed by my pendulum larger?" and "Which material is best at causing a marble to change direction?"
- Materials provide opportunities for students to ask questions and conduct investigations, engage in problem-solving to make connections across disciplines, and develop an understanding of science concepts. In a STEM activity called Rock Hard, students solve the problem of the mini flagpole and how it was damaged. They test various solutions and eventually mix concrete.

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Indicator 2.2

Materials anchor the learning in phenomena and problems as the key lever for driving learning and student mastery of disciplinary knowledge and skills.

1	Materials embed phenomena and problems across lessons to support students in constructing, building, and developing knowledge through authentic application and performance of scientific and engineering practices, recurring themes and concepts, and grade-level content as outlined in the TEKS.	PM
2	Materials intentionally leverage students' prior knowledge and experiences related to phenomena and engineering problems.	M
3	Materials clearly outline for the teacher the scientific concepts and goals behind each phenomenon and engineering problem.	M

Partial Meets | Score 2/4

Materials partially meet the criteria of this indicator. Materials somewhat anchor the learning in phenomena and problems as the key lever for driving learning and student mastery of disciplinary knowledge and skills.

Materials partially embed phenomena and problems across lessons to support students in constructing, building, and developing knowledge through authentic application and performance of scientific and engineering practices, recurring themes and concepts, and grade-level content as outlined in the TEKS. Materials intentionally leverage students' prior knowledge and experiences related to phenomena and engineering problems. Materials clearly outline for the teacher the scientific concepts and goals behind each phenomenon and engineering problem.

Evidence includes but is not limited to:

Materials embed phenomena and problems across lessons to support students in constructing, building, and developing knowledge through authentic application and performance of scientific and engineering practices, recurring themes and concepts, and grade level content as outlined in the TEKS.

- Materials embed phenomena in some instructional components to support students in constructing, building, and developing knowledge. For example, in the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*, the materials provide narrative texts that provide access to phenomena that provide a springboard for learning. However, in the *Teacher Textbook - Grade 2 Science* most of the chapters begin with Teacher Guided Questions to Inquiry, which provides a series of questions for the teacher to ask the students to begin the learning cycle. While the questions are designed well, they are not a replacement for observing phenomena.
- Materials provide opportunities for students to develop, evaluate, and revise their thinking as they define problems. In the *Teacher Textbook - Grade 2 Science*, some project-based lessons center around phenomena. Students then design solutions. However, the ideas presented for problems to be solved are not phenomena-inspired ideas. They are problems presented by the teacher.
- The materials provide problems for students to address; however, the problems are often embedded with a specific expected outcome provided by the materials and not created by the

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students, making the application and performance of engineering practices less than authentic. For example, in Chapter 5 of the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*, students are provided an opportunity to design and build a bridge. The teacher instructions state, “this activity’s objective is for students to use their knowledge of physical properties and their engineering capabilities to design and build a bridge.” There is no authentic problem the students are solving and no relevant context or purpose for engaging in the engineering design process for this activity; the materials simply tell the students to complete the task.

- The materials provide some direct connections to the recurring themes and concepts across disciplines as the TEKS require. For example, there are opportunities for students to consider cause and effect relationships as they relate to pushes and pulls, but there are no opportunities to make a connection to how that also relates to cause and effect with regards to changes caused by heat.

Materials intentionally leverage students’ prior knowledge and experiences related to phenomena and engineering problems.

- Materials provide opportunities to leverage students’ prior knowledge and phenomena-related experiences. For example, in the Matter and Properties Unit, the teacher holds up a piece of clothing and asks students what it is and to identify the properties of the materials. The Teacher Textbook provides common misconceptions and how to address them. The Matter and Properties unit states, “Students may find it difficult to understand that the material is the same before and after you have done something to it. Have them consider whether you have added anything to the substance or taken anything away in each case. Ensure students understand that you are not referring to the fabric when you use the word ‘material.’ This is likely to be the only instance they have come across of its use.” In the Teacher Textbook, at the beginning of each chapter there is a section called The Science that provides information needed to activate student background knowledge for the chapter.
- Materials intentionally leverage students’ prior knowledge of engineering problems. For example, in *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*, Activity 9, students will design and build a device that uses sound to solve the problem of communicating over a distance. Students will use the design engineering process and the background knowledge from the chapter. Students are assigned the challenge and work in groups. In the *Learn By Doing STEAM Activity Reader Book - Grade 2 Student Edition*, students use their understanding of physical properties and engineering capabilities to design and build a bridge.

Materials clearly outline for the teacher the scientific concepts and goals behind each phenomenon and engineering problem.

- Materials guide the teacher on the goals behind each phenomenon and engineering problem. For example, in the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*, materials provide lesson objectives. The Teacher Textbook lessons contain an objective that outlines the scientific goals for each lesson. In the Combining Materials lesson, the objective states, “Students will be able to combine materials that, when put together, can do things that they cannot do by themselves (such as building a tower) and justify the selection of those materials.”
- Materials guide teachers on the scientific concepts behind each phenomenon and engineering problem. For example, the teacher *Textbook - Grade 2 Science* lessons contain a section called

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The Science that outlines the scientific concepts for each lesson. The Combining Materials lesson states, “We use different materials for different purposes according to their properties. However, few of the things we commonly use are made from just one material. We combine materials because they can do things together that they cannot do by themselves.” The Teacher Guide clearly outlines the order of lessons, starting with TEKS and vertical alignment, then assessment, and concluding with How the Content Supports Teachers.

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Indicator 3.1

Materials are designed to build knowledge systematically, coherently, and accurately.

1	Materials are vertically aligned and designed for students to build and connect their knowledge and skills within and across units and grade levels.	M
2	Materials are intentionally sequenced to scaffold learning in a way that allows for increasingly deeper conceptual understanding.	M
3	Materials clearly and accurately present grade-level-specific core concepts, recurring themes and concepts, and science and engineering practices.	M
4	Mastery requirements of the materials are within the boundaries of the main concepts of the grade level.	M

Meets | Score 6/6

The materials meet the criteria for this indicator. Materials are designed to build knowledge systematically, coherently, and accurately.

Materials are vertically aligned and designed for students to build and connect their knowledge and skills within and across units and grade levels. Materials are intentionally sequenced to scaffold learning in a way that allows for an increasingly deeper conceptual understanding. Materials clearly and accurately present grade-level-specific core concepts, recurring themes and concepts, and science and engineering practices. Mastery requirements of the materials are within the boundaries of the main concepts of the grade level.

Evidence includes but is not limited to:

Materials are vertically aligned and designed for students to build and connect their knowledge and skills within and across units and grade levels.

- Materials are vertically aligned and designed for students to build and connect their knowledge and skills. For example, in the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*, when looking at a specific TEKS, Earth and Space, regarding Earth materials, the grade-level materials explore shapes, color, size, and texture and make observations as a foundation for the next grade level. In grade 2, students build a tower and talk about the properties and texture of rocks to make the tower stable. In the *STEAM Activity Guide, Amelia Rose Explores Earth and Space*, the teacher reads through the story and activity. The student then completes a journal about plants and the types of soils. The students write about the color, textures, and water retention. It is aligned with the kindergarten and grade 1 lessons.
- Materials are aligned and provide connections to prior knowledge. Materials offer a K-8 program and provide a grade-level vertical alignment document demonstrating how students build and connect knowledge across grade levels. The Teacher Supports show how the materials are vertically aligned. The document titled Horizontal and Vertical Alignment Information states, "As students progress within each grade, the STEAM storybooks are the first level in a series of TPS curricular materials, horizontally aligned to allow the students to engage in a curriculum that builds on knowledge and skills aligned with the Texas Essential Knowledge and Skills.

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“Materials are designed to build content knowledge within each chapter. For example, the Teacher's Guide scaffolding information is included at the beginning of every chapter.

- Materials are designed to connect knowledge and skills across grade levels. Examples include the Project Based Lessons in the *Teacher Textbook - Grade 3 Science*, which list the scaffolding between grade levels for the TEKS. In the *Teacher Textbook*, the TEKS for the prior and following grade levels are listed under the section labeled Scaffolding. The Heating and Cooling chapter lists the objectives for kindergarten and first grade and the TEKS for third grade related to heating and cooling in the Scaffolding section.

Materials are intentionally sequenced to scaffold learning in a way that allows for increasingly deeper conceptual understanding.

- The *Teacher Program Guide - Grades K-8 Science* describes the lesson progression with each resource. The guide explicitly states teachers begin each unit with the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition* and then move to the exploration in the *Teacher Textbook - Grade 2 Science*. The *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition* introduces all chapters with fictional characters asking and answering questions. Materials intentionally provide content information through the narrative text before students move to exploration. The lesson plans included in the *Teacher Textbook - Grade 2 Science* begin with students engaging with media, discussing what they understood, have seen before, or sparked curiosity. The teacher then begins the instruction, providing steps to complete the investigation if materials offer one.
- Materials are intentionally sequenced to scaffold learning in a way that allows for deeper understanding. For example, in the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*, in Chapter 3, Lost in a Forest, the teacher reads the story. The students do activities related to the story, then progress to the Design Engineering Challenge at the end of the unit to demonstrate a deeper understanding. In the *Teacher Textbook - Grade 2 Science*, there is sufficient evidence that materials are intentionally sequenced to scaffold learning in a way that allows for deeper understanding. In How Do You Group Objects?, the teacher starts with background information, then guided questions and additional hints. Then, the students conduct mini-experiments to separate and compare objects.
- Materials present content in a way that builds complexity within and across units. In the Teacher Guide, students begin learning about matter and its properties. Students start by taking clay and making objects and then changing those objects to make new ones. For the final investigation, students will create a bridge that will need to hold up to a strength test.
- Materials include a concrete progression before abstract reasoning when presenting concepts that allow for an increasingly deeper conceptual understanding. For example, in the *Learn By Doing STEAM Activity Reader Book - Grade 2 Student Edition*, Chapter 2, Activity 3, students experiment with light to examine the behavior of a light source before drawing a representation of their results in the book. In the *Teacher Textbook - Grade 2 Science*, in the chapter Matter and Properties, students experiment to alter several materials using heat before reading about heating and cooling and answering questions in the book. In the *Teacher Textbook*, the lesson begins with students talking about properties and looking at different objects. Later, students use mathematical concepts to compare strength and flexibility with rulers.
- Materials include a progression of concrete and representational before abstract reasoning when presenting concepts that allow for an increasingly deeper conceptual understanding. In the *Teacher Textbook - Grade 2 Science*, students begin learning about matter and how to describe and classify matter. Students use several different physical properties to compare and

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separate objects. Students name a property they can test and describe what classifying objects means.

- Materials are intentionally sequenced to scaffold learning. For example, in the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*, Chapter 4, Zane's Birthday Candle, the information is scaffolded and deepened with complexity through the Idea Boxes. In Idea Box 1, students compare and contrast the physical properties of water and a candle. In Idea Box 2, students mind map the physical properties change. In Idea Box 3, students use 3D solids to describe the physical properties of a candle.

Materials clearly and accurately present grade level specific core concepts, recurring themes and concepts, and science and engineering practices.

- Materials clearly and accurately present grade-level-specific core concepts, recurring themes, and science and engineering practices. For example, in the *Learn by Doing STEAM Activity Reader Book - Grade 2 Student Edition*, in the Moon Mystery unit, the core concepts are present, recurring themes are introduced, and science and engineering practices are also present in the Apollo Research Project. The short story describes the missing moon. In the story, the students remember that the Moon never leaves and is in the new moon phase. The *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*, Chapter 3, Lost in a Forest, introduces measurement, recording, and graphing of weather information and identifying patterns in the data, along with the importance of weather and seasonal information for making choices in clothing and activities.
- Materials clearly and accurately present grade-level-specific core concepts. For example, in the *Teacher Textbook - Grade 2 Science*, the core concepts are evident throughout the Project-Based Lessons. In the Force, Motion, and Energy lesson, students demonstrate and explain that sound is made by vibrating matter, as aligned to the TEKS.
- Materials clearly and accurately present engineering concepts. Students design and create their engineering practice project in the *STEAM Activity Guide*. In the *Learn By Doing STEAM Activity Reader Book*, in Chapter 5, Build a Bridge, students use the Engineering Design Process to create a bridge from popsicle sticks. Students use the core concepts of physical properties.
- Materials present grade-level-appropriate recurring themes and concepts. According to the *Teacher Program Guide - Grades K-8 Science*, one of the approaches TPS uses to teach science is storytelling. "They begin their learning journey with a story relevant to their lives with scientific concepts embedded within it." "The activities sections at the end of each chapter allow the student to explore the scientific topics in activities that engage them physically and mentally." Although materials present grade-level-specific core concepts, no clear, concise road map exists.

Mastery requirements of the materials are within the boundaries of the main concepts of the grade level.

- Materials provide mastery requirements that are within the boundaries of the main concepts of the grade level. At times, materials contain content that is above grade level, in addition to, not instead of content that is at grade level. Materials create inclusive content, and as such provides materials that also cater for below and above level students. For example, in the traditional lesson, Energy, the materials introduce the idea of energy changing from one form to another and state the focus TEKS is "2.6A classify matter by observable physical properties, including texture, flexibility, and relative temperature, and identify whether a material is a solid or liquid."

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The lesson reflects the content of the student expectations, and students encounter the focus question number 5, “How does electricity cook your dinner? It changes into heat energy.”

- Materials include some lessons where the mastery requirement falls outside the boundaries of the main concept of the grade level which is appropriate for some learners. For example, in the lesson Making Changes, the idea of state changes is introduced. While the TEKS mentions changes to matter’s physical properties, such as melting and freezing, the idea of state changes is introduced in grade 3. However, in the Test Yourself section of the lesson, students must recognize in question 1 that “When you melt a material, you are changing its state as well as the temperature.” The boundaries of the grade level indicate that changes in temperature account for changes such as melting and freezing; the concept of these being state changes is appropriately introduced in this lesson.
- Materials stay within the boundaries of the main concepts of the grade level and include material outside the main concept when appropriate. For example, in the Combining Materials lesson, students are learning about combining matter to form new objects and that you choose things based on the physical properties that are needed. The lesson uses a clever example of several different types of shoes and their different properties and introduces the term waterproof for the lesson as well as flexible. While flexibility is listed as a term to be mastered in grade 2, waterproof is not present in the K-5 science standards. This is an opportunity to expose students to upper-level vocabulary, waterproof is listed as a key word for the lesson.

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Indicator 3.2

Materials provide educative components to support teachers' content and knowledge coherence.

1	Materials support teachers in understanding the horizontal and vertical alignment guiding the development of grade-level content, recurring themes and concepts, and scientific and engineering practices.	PM
2	Materials contain explanations and examples of science concepts, including grade-level misconceptions to support the teacher's subject knowledge and recognition of barriers to student conceptual development as outlined in the TEKS.	M
3	Materials explain the intent and purpose of the instructional design of the program.	M

Partial Meets | Score 3/6

The materials partially meet the criteria for this indicator. Materials provide some educative components to support teachers' content and knowledge coherence.

Materials provide some support to teachers in understanding horizontal and vertical alignment guiding the development of grade-level content, recurring themes and concepts, and scientific and engineering practices. Materials contain explanations and examples of science concepts, including grade-level misconceptions to support the teacher's subject knowledge and recognition of barriers to student conceptual development as outlined in the TEKS. Materials explain the intent and purpose of the instructional design of the program.

Evidence includes but is not limited to:

Materials support teachers in understanding the horizontal and vertical alignment guiding the development of grade level content, recurring themes and concepts, and scientific and engineering practices.

- The introductory materials in the *Teacher Textbook - Grade 2 Science* state, "Science Concepts, scientific practices, and engineering are introduced in this first component," in reference to the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*. The inclusion of the Horizontal Alignment Chart, the TEKS 1-5 Content Guides, and pacing guide provide a document that shows when scientific and engineering practices and recurring themes are addressed. This does not support the teacher in understanding how instructional content within the program builds horizontally or vertically.
- The *Teacher Program Guide - Grades K-8 Science* somewhat supports teachers with the vertical and horizontal alignment of the program. It references the use of a storybook "to provide an introduction to in a personally relevant manner." The *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition* is followed by the activities section. Materials say, "These activities build upon communication, creativity, critical thinking, and collaboration." Materials state, "As students progress through the grade levels, the STEAM storybooks provide opportunities to develop knowledge and skills gradually built through vertical alignment through the TEKS." The description in the *Teacher Program Guide - Grades K-8 Science* does not fully support teachers, as it does not reference specific learning.

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- Materials include some guidance that supports teachers in understanding how new learning connects to previous and future learning across grade levels in the Scaffolding Information section within the lesson. At the beginning of the Traditional lessons in the *Teacher Textbook - Grade 2 Science*, the Scaffolding Information section provides some information on knowledge students should already have, then lists the TEKS for the previous and future grade levels. Listing the TEKS does not provide enough guidance about connection to future learning. Materials provide minimal guiding documents or information that support teachers in understanding how new learning connects to previous and future learning across grade levels.
- The instructional materials include some guiding documents that support teachers in understanding how new learning connects to previous and future learning across grade levels. For example, *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition* includes an Appendix - Essential Content Guide that describes what science, math, and ELAR concepts are taught in each unit. There is a horizontal and vertical alignment information document in the Online Library for Teacher Support. This provides general information and does not help teachers understand how their specific grade-level content connects to prior or future learning.
- The materials provide little teacher support for understanding the horizontal and vertical alignment of the recurring themes and concepts across disciplines, as the TEKS require. For example, there are opportunities to consider cause and effect relationships as they relate to pushes and pulls, but there are no opportunities to make a connection to how that also relates to cause and effect with regard to changes caused by heat. *The Teacher Program Guide - Grades K-8 Science* mentions, "TPS help teachers to facilitate students to make connections between . . . recurring themes and concepts," but there is little evidence in the materials of providing teacher support in understanding these and drawing both horizontal and vertical connections.

Materials contain explanations and examples of science concepts, including grade level misconceptions to support the teacher's subject knowledge and recognition of barriers to student conceptual development as outlined in the TEKS.

- Materials contain explanations and examples of science concepts for teachers. For example, in the *Teacher Textbook - Grade 2 Science*, The Science section of the lesson is a synopsis of what students have learned and will learn. Background and Preconceptions sections are also in the lessons to help teachers understand before starting the activities. The background information for teachers provides explanations and examples of science concepts. In the Teacher Textbook, before each experiment, the materials offer a section titled Background and Misconceptions. In the How Do You Make It Change? experiment, the Background and Preconceptions section tells the teacher how to prepare the clay shapes for the experiment and provides questions, one misconception, and an extension.
- Materials contain explanations for teachers on grade-level misconceptions to support teacher's subject knowledge. For example, in the *Teacher Textbook - Grade 2 Science*, the Common Misconceptions section helps the teacher "know better." Background and Preconceptions sections are also in the lessons to help teachers understand before starting the activities. In the Making Changes lesson, the section provides background information about the properties of matter. The same lesson contains a section titled Common Misconceptions that states, "Students may find it difficult to understand that the material is the same before and after you have done something to it. Have them consider carefully whether you have added anything to the substance or taken it away. Ensure students understand that you are not referring to the fabric when you use the word 'material.' This is likely to be the only instance they have come across of its use."

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- The materials provide explanations and examples of science concepts to support the teacher's subject knowledge. For example, the *Teacher Textbook - Grade 2 Science* provides a section titled The Science prior to traditional (TRAD) lessons and a Background and Preconceptions section in the Science Is A Verb (SIAV) lessons. These provide a thorough yet concise explanation of the science contained in the lesson and corresponding activities.

Materials explain the intent and purpose of the instructional design of the program.

- Materials provide a purpose or rationale for the instructional design. The *Teacher Program Guide - Grades K-8 Science* in the Support Notes for Teachers states that the content scaffolds as the characters go alongside the diverse students. The *Teacher Program Guide - Grades K-8 Science*, under the section Support Notes for Teachers, gives information about the rationale of how the program was designed. For example, "The STEAM storybook was designed with two key purposes: first to teach science through the prism of STEAM, science, technology, engineering, and math as an approach more relevant to students' lives."
- Materials explain the intent of the instructional design of the program. The *Teacher Program Guide - Grades K-8 Science* describes the philosophy of science teaching and learning. They explain the publisher's philosophy that we learn best by doing and the importance of scientific understanding for all students. They also explain the science teacher's role in developing critical thinking, problem-solving, and an appreciation of the scientific process. The *Teacher Program Guide - Grades K-8 Science* describes the Teaching Pedagogy - Storytelling and STEAM. The guide references the research on structure strategies and more information on why teaching science through storytelling is important.
- Materials provide an explanation of the goals of the program. For example, in the *Teacher Program Guide - Grades K-8 Science*, the Philosophy of Science teacher and learning section states, "TPS believes that we learn best by doing. Science is more than memorizing facts. It is a way of organizing and understating the surrounding universe." The section references active learning, STEAM, storytelling, and inquiry as the main strategies of the program to cover required TEKS. For example, the subsection on research-based strategies states, "Recent research about STEAM content and storytelling can be read at the end of this guide. It heavily impacted the design of our program, and the first component of the program uses storytelling as its main strategy." The Program Introduction does not reference goals tied to content knowledge, recurring themes and concepts (RTCs), or science and engineering practices (SEPs).

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Indicator 4.1

Materials provide opportunities for students to engage in productive struggle through sensemaking that involves reading, writing, thinking, and acting as scientists and engineers.

1	Materials consistently support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers.	M
2	Materials provide multiple opportunities for students to engage with grade-level appropriate scientific texts to gather evidence and develop an understanding of concepts.	PM
3	Materials provide multiple opportunities for students to engage in various written and graphic modes of communication to support students in developing and displaying an understanding of scientific concepts.	M
4	Materials support students to act as scientists and engineers who can learn from engaging in phenomena and engineering design processes, make sense of concepts, and productively struggle.	M

Partial Meets | Score 2/4

The materials partially meet the criteria for this indicator. Materials provide some opportunities for students to engage in productive struggle through sensemaking that involves reading, writing, thinking, and acting as scientists and engineers.

Materials consistently support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers. Materials provide some opportunities for students to engage with grade-level appropriate scientific texts to gather evidence and develop an understanding of concepts. Materials provide multiple opportunities for students to engage in various written and graphic modes of communication to support students in developing and displaying an understanding of scientific concepts. Materials support students to act as scientists and engineers who can learn from engaging in phenomena and engineering design processes, make sense of concepts, and productively struggle.

Evidence includes but is not limited to:

Materials consistently support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers.

- Materials support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers. In the *Learn by Doing STEAM Activity Reader Book - Grade 2 Student Edition*, materials provide reading through storytelling, thinking through the idea boxes, and acting through the design and engineering pieces. There are writing prompts and opportunities to describe what they know or have learned. In the Student Textbook, there are writing activities. Students read like scientists in the *Learn by Doing STEAM Activity Reader Book - Grade 2 Student Edition*. Additionally, this component includes idea boxes to support the teacher in having students think like scientists and stimulate critical thinking through class discussion of the chapter texts. Following each chapter, activities allow the students to act as scientists or engineers investigating and designing engineering solutions. The activity sections also include opportunities for the students to engage in age-appropriate letter-word analysis, writing, and math. In Chapter 6, "Drip, Drip, Drip," students read and think like scientists and

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engineers about the topic. In Activity 3 of the same chapter, students think and act like scientists to experiment to compare saltwater and freshwater. After listening to the story, "Where is Louis?" In the *Learn by Doing STEAM Activity Reader Book - Grade 2 Student Edition*, students test the effect of light on color perception. Throughout the materials, there is consistent reading through the storytelling, thinking through the idea boxes, writing predictions and observations, and acting through the design and engineering pieces.

- Materials provide learning activities that support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers. In the *STEAM Activity Guide - Grade 2 Student Edition*, students read, write, think, and act like scientists. In "It's a Worm's Life," students research what habitat is needed for mealworms before creating their habitat. Students then observe and record observations about ten mealworms as they progress through their life cycles.
- The *Teacher Program Guide - Grades K-8 Science* provides a philosophy of science teaching and learning as The materials provide teachers with guidance on labs in the "Science is a Verb" explanation found in the Teacher Textbook that supports sensemaking. For example, the materials state, "The critical portion of any lab is to have a thorough discussion of the results and student thinking after the experiment is complete. It is suggested you take as much time as the experiment to have this discussion with students. The real learning occurs not from hands-on experiments, but from a deep discussion of the experiment while making connections to the concept they are learning." The guidance supports sensemaking by taking the lesson beyond a hands-on investigation and building conceptual knowledge through discussion.

Materials provide multiple opportunities for students to engage with grade level appropriate scientific texts to gather evidence and develop an understanding of concepts.

- Sometimes, the materials provide text that is not grade-level appropriate. For example, in the traditional lesson, Energy, the materials introduce the idea of energy changing from one form to another and state the focus TEKS is "2.6A classify matter by observable physical properties, including texture, flexibility, and relative temperature and identify whether a material is solid or liquid." The lesson does not reflect the content of the students' expectations and students encounter the focus question 5, "How does electricity cook your dinner? It changes into heat energy."
- The materials sometimes provide scientific texts that are not grade-level appropriate and impair students' ability to gather evidence and develop an understanding of the concept. For example, in the lesson Combining materials, students are learning about combining matter to form new objects and that you choose things based on the physical properties that are needed. The lesson uses a clever example of several different types of shoes and their different properties and introduces the term "waterproof" for the lesson and flexible. While flexibility is listed as a term to be mastered in grade 2, waterproof is not in the K-5 science standards. While this could be an opportunity to expose students to upper-level vocabulary, waterproof is instead listed as a keyword for the lesson.
- The material sometimes provides appropriate scientific text for the targeted grade level. For example, in the *Learn by Doing STEAM Activity Reader Book - Grade 2 Student Edition*, the story spends several pages discussing linear and nonlinear motion instead of using grade-level appropriate language.

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Materials provide multiple opportunities for students to engage in various written and graphic modes of communication to support students in developing and displaying an understanding of scientific concepts.

- Materials provide multiple opportunities for students to engage in various written and graphic modes of communication to support students in developing and displaying an understanding of scientific concepts. In the *Learn by Doing STEAM Activity Reader Book - Grade 2 Student Edition*, students explain how sand was moved to the dunes after learning how wind and water move soil. Students write about the answer. In the *Learn by Doing Steam Activity Reader, Teacher Edition*, students investigate the needs of plants and discuss what had the biggest impact on plant growth. Next, students record whether their hypothesis is correct, fill in the blanks, record short answers, match, fill in tables, and complete graphic organizers.
- Materials provide multiple opportunities for students to communicate thinking on scientific concepts in written and graphic modes. In the *Student Textbook - Grade 2 Science*, in the investigation, "Pendulum Swing Art," students record their observations in written form and by drawing. Students draw pictures of their paint design that resulted from the cup swinging. Students also write to answer questions about the investigation. In the "How Much Is Enough?" investigation, students observe the distance the rubber band stretched. Students then write to answer questions about forces. In the *Student Textbook - Grade 2 Science* in the Tools unit, students draw and label a tool. In the How do You Group Objects unit, students use graphic organizers to classify objects by size, temperature, and weight. In the Properties unit, students draw a picture and then complete a fill-in-the-blank table for the investigation.
- Materials provide multiple opportunities for students to engage in various modes of communication to display understanding. For example, in the *Student Textbook*, the Energy unit, the students communicate thinking on scientific concepts in written and graphic modes, with data tables and open-ended written questions. The *Learn by Doing STEAM Activity Reader Book - Grade 2 Student Edition*, has many opportunities for displaying understanding. Throughout the reader, there are fill-in-the-blanks, open-ended questions, drawing observations and ideas, and graphs for data. In chapter 4, "Who Shut That Door?" there are scenarios for understanding magnets and how they work, as well as tables to collect data and analyze.

Materials support students to act as scientists and engineers who can learn from engaging in phenomena and engineering design processes, make sense of concepts, and productively struggle.

- Materials support students to act as scientists and engineers who can learn from engaging in phenomena and engineering design processes. In the *Learn by Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*, students experience the scientific inquiry method as they explore how light and colors interact. As students experiment with the light and colors, they record information in their journals. Students answer questions in their journals about the different results. Bridges will be tested by adding one gram of weight. Students then discuss which bridges were the strongest and compare them.
- Materials support students to act as scientists and engineers who can productively struggle. The student textbook provides student engagement and perseverance of concepts through productive struggle while acting as engineers in the Scientific and Engineering Practice Project in the *STEAM Activity Guide - Grade 2 Student Edition*. In this project, students find a problem, design, and engineer a solution. Students conduct the research, plan, build a mock-up, prototype, and test it. They evaluate the results to determine how to make it better.

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- Materials support students to act as scientists and engineers who can make sense of concepts. The student textbook provides student engagement and perseverance of concepts through productive struggle while acting as scientists and engineers in STEM Projects in the *STEAM Activity Guide - Grade 2 Student Edition*. In the "Window Shopping?" project, students explore how light and colors interact and record data about them. They also work on the physical properties of paper structures, magnets to control movement, and marbles rolling and sliding down ramps. They then apply that knowledge to build a window display.

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Indicator 5.1

Materials promote students' use of evidence to develop, communicate, and evaluate explanations and solutions.

1	Materials prompt students to use evidence to support their hypotheses and claims.	M
2	Materials include embedded opportunities to develop and utilize scientific vocabulary in context.	M
3	Materials integrate argumentation and discourse throughout to support students' development of content knowledge and skills as appropriate for the concept and grade level.	PM
4	Materials provide opportunities for students to construct and present developmentally appropriate written and verbal arguments that justify explanations to phenomena and/or solutions to problems using evidence acquired from learning experiences.	PM

Partial Meets | Score 2/4

The materials partially meet the criteria for this indicator. Materials prompt students to use evidence to support their hypotheses and claims. Materials partially promote students' use of evidence to develop, communicate, and evaluate explanations and solutions.

Materials include embedded opportunities to develop and utilize scientific vocabulary in context. Materials integrate some argumentation and discourse throughout to support students' development of content knowledge and skills as appropriate for the concept and grade level. Materials provide some opportunities for students to construct and present developmentally appropriate written and verbal arguments that justify explanations of phenomena and/or solutions to problems using evidence acquired from learning experiences.

Evidence includes but is not limited to:

Materials prompt students to use evidence to support their hypotheses and claims.

- The materials outline the DAPIC - define, assess, plan, implement, and communicate - process in the *Teacher Program Guide - Grades K-8 Science*. The DAPIC presents a scaffold to help students use evidence to support claims. Teacher guidance in the Program Guide indicates that materials intend for teachers to use the DAPIC in practical investigations for students to communicate claims and solutions based on evidence.
- Materials prompt students to use evidence when supporting their hypotheses and claims. In Chapter 8, Activity 5, Part B, in the *Learn By Doing STEAM Activity Reader Book - Grade 2 Student Edition*, students investigate what plants need to survive. Students work in groups to create a hypothesis of what they expect to be the outcome of the investigation and explain the rationale behind their hypothesis. Students test their hypotheses and then analyze and discuss the results. Materials state, "Discuss the results with students. Which factor had the biggest impact on plant growth?" In the textbook's Project-Based Lesson "Can You Change Sound?", students investigate if they can change the sound of kazoos. Students first create a prediction of what they think the sound will be before poking a hole in each kazoo. Students test their hypotheses and then analyze and discuss the results. After testing each one, there are

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questions, including, "Did all the samples the teacher had sound the same? Would it sound the same if you used a smaller tube?"

- In *Learn By Doing STEAM Activity Reader Book - Grade 2 Student Edition*, Chapter 8, Activity 5, students work in small groups and test and write hypotheses. Students record their methods and results in their notebooks. In Chapter 3, Activity 10, students investigate erosion using a stream table. Students create a hypothesis and write a rationale. They test their hypotheses and write the results in their journal. Materials imply the use of evidence by stating, "Record your results here" and "Write your conclusion here."
- Materials provide prompts for students to use evidence to support their hypotheses and claims. For example, in the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*, Chapter 3, Activity 1, students are prompted to "Write your conclusions." In Chapter 4, Activity 8, students are prompted to "write a sentence describing whether your hypotheses were correct."
- Materials prompt students to use evidence to support their hypotheses or claims. For example, the *Student Textbook - Grade 2 Science* in the Project-Based Lesson question 3 in the Science section mentions, "collect data from your tests to use as evidence for discussion."

Materials include embedded opportunities to develop and utilize scientific vocabulary in context.

- Materials include embedded opportunities to develop, utilize, and apply scientific vocabulary in context. In the *Learn By Doing STEAM Activity Reader Book - Grade 2 Student Edition*, students read chapters about science content with embedded scientific vocabulary. Students then apply the vocabulary to some of the activities following each chapter. For example, in Chapter 6, students read about saltwater and freshwater. The embedded vocabulary words include *dissolving ocean, salt, saltwater, and freshwater*. In Activity 3, students use vocabulary words to create saltwater and compare how things sink and float in saltwater versus freshwater. In Chapter 7, students read about animal adaptations. The embedded vocabulary words include *breath, gills, habitat, lungs, prey, shelter, and survive*. In the following Activity 10, students utilize the vocabulary words in the text to record and compare in drawings how the structures and behaviors of animals help them find and take in food, air, and water.
- Additionally, in the *Learn By Doing STEAM Activity Reader Book - Grade 2 Student Edition*, students learn vocabulary through the read-aloud story. In Chapter 3, after reading through the read-aloud Activity 11, students will review learned vocabulary words. In the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*, students should demonstrate language readiness by using words in a sentence under the vocabulary guidance.
- Materials include word work activities with science vocabulary. In the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*, vocabulary words are printed in bold. Students complete an activity to pronounce the words in syllables, sort by initial sound, sound out the words, and match the words to a picture.
- Materials provide defined vocabulary lists. The *Teacher Textbook - Grade 2 Science* has a section labeled "Key Words." These are the vocabulary words for the unit. They are listed with the definition beside each word.

Materials integrate argumentation and discourse throughout to support students' development of content knowledge and skills as appropriate for the concept and grade level.

- The *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition* contains some opportunities for students to develop practicing argumentation and discourse. In Chapter 3,

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Activity 1, students test the effect of light on color perception and discuss the results. The text says, "Discuss the results with the students after they have communicated their findings," and "During the discussion, other students should listen and engage respectfully in scientific discussion." These supports provide appropriate guidance for students to participate in and learn discourse skills.

- The materials provide some opportunities for students to develop how to engage in discourse. The *Learn By Doing STEAM Activity Reader Book - Grade 2 Student Edition* contains some opportunities for students to develop how to practice argumentation and discourse. In the Energy lesson, students learn that different forms of energy are important to everyday life. The text says, "Ask the students to prepare a presentation about the information learned in today's lesson" and "Ask them to consider their audience when preparing their presentation." It also says, "Students should be encouraged to listen carefully to each other's presentations, make notes and questions, and engage in respectful discussion on the strengths and weaknesses of each other's presentation." While this supports discourse among students, these do not include opportunities to develop an argument; argumentation is not integrated throughout the materials.
- The materials integrate some discourse within stages of the learning cycle. However, they lack guidance to teachers in developing these skills into scientific arguments. For example, teacher guidance suggests that students share their group designs on activities in the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*. The teacher asks how they would improve their design and why they designed the device the way they did. In this activity, the teacher asks guiding questions for the discourse, and there is little opportunity for students to engage in argumentation. In another example, students are asked to share the results of an investigation; however, there is no teacher guidance for students to provide proof or evidence for the findings in their investigations.

Materials provide opportunities for students to construct and present developmentally appropriate written and verbal arguments that justify explanations to phenomena and/or solutions to problems using evidence acquired from learning experiences.

- Materials provide some opportunities for students to justify explaining phenomena and solutions to problems in verbal responses. In the *Learn By Doing STEAM Activity Reader Book - Grade 2 Student Edition*, Chapter 3, Activity 1, students test the effect of light on color perception. The text states, "Ask students to communicate what they learned from this experiment. Ask them to write one to two sentences in their notebooks." The materials do not provide a structure or prompt for students to construct an argument using evidence from the experiment.
- Materials provide criteria for some developmentally appropriate responses to explain a phenomenon or defend a solution to problems but do not support constructing an argument. In the *Teacher Textbook - Grade 2 Science*, Earth, and Space Project-Based Lesson, students investigate erosion with wind and water. The text states, "Some topics in science promote scientific debate," and "It is important to understand that a scientific debate is not an argument. Scientists use data to support their arguments and create models to make predictions." It also says, "Encourage students to think about the types of scientific debate today's topic may invoke. What are the different viewpoints that people may have on this topic? Place students into pairs and ask them to engage respectfully in scientific debate. Provide students with the data and information they need to support their argument." The materials use the word argument, and

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students are expected to develop an argument with the provided evidence; however, there is no structure for them to understand what arguments are or how to construct one.

- Materials provide some opportunities for students to construct and present developmentally appropriate, justified arguments. In the *STEAM Activity Guide - Grade 2 Student Edition*, students talk about recycling with discussion points. Students share experiences based on questions such as, "Do you know what recycling is?" Also, In the *Teacher Textbook - Grade 2 Science*, Project-Based Lesson, students discuss each experiment's results and compare and contrast results.
- Materials provide some opportunities for discourse but do not rise to the level of constructing an argument. The materials in the *Learn By Doing STEAM Activity Reader Book - Grade 2 Student Edition* prompt students to "communicate their findings" and engage in scientific discussions about activities 1-3 in Chapter 1. This guidance does not provide the expectation that students will construct arguments to justify their explanations for the evidence they gathered in the investigation or structures to construct arguments using evidence.

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Indicator 5.2

Materials provide teacher guidance to support student reasoning and communication skills.

1	Materials provide teacher guidance on anticipating student responses and the use of questioning to deepen student thinking.	M
2	Materials include teacher guidance on how to scaffold and support students' development and use of scientific vocabulary in context.	M
3	Materials provide teacher guidance on preparing for student discourse and supporting students in using evidence to construct written and verbal claims.	M
4	Materials support and guide teachers in facilitating the sharing of students' thinking and finding solutions.	M

Meets | Score 4/4

The materials meet the criteria for this indicator. Materials include some guidance to support student reasoning and communication skills.

Materials provide some teacher guidance on anticipating student responses and the use of questioning to deepen student thinking. Materials include teacher guidance on how to scaffold and support students' development and use of scientific vocabulary in context. Materials provide teacher guidance on preparing for student discourse and supporting students in using evidence to construct written and verbal claims. Materials support and guide teachers in facilitating the sharing of students' thinking and finding solutions.

Evidence includes but is not limited to:

Materials provide teacher guidance on anticipating student responses and the use of questioning to deepen student thinking.

- The materials provide teacher responses to possible students' responses. The materials divide teacher guidance into correct student responses, incorrect student responses, and partially correct student responses. The *Teacher Program Guide - Grades K-8 Science* recommends that students responding correctly be provided with "Level 2 assessment questions" from the "Online Library - Assessment tools" for the TEKS being taught and affirm comprehension. The guide recommends that students responding incorrectly be provided with "Level 1 assessment questions." The materials state, "A student responds incorrectly - use the Online Library - Assessment tools; choose Level 1 assessment questions for the TEKS being taught.... Determine if there is a misconception and resolve."
- Materials state teachers should respond the same to partially incorrect responses but expect a shorter time frame to resolve misconceptions. Additional suggestions to respond to struggling learners include studying keywords and using them correctly in a sentence, using "an arts project from the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition* states for relevant TEKS," and going back to "an earlier grade to ensure prior grade learning is completed."
- The *Teacher Textbook - Grade 2 Science* provides teachers with some possible student responses to questions and tasks. For example, when asked, based on the three previous experiments,

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what plants need to grow, “possible student response should include - nutrients from the soil, sunlight, and water.” In an assessment section, one question asks how a man in a kitchen could make a sound. The materials state, “Answers may vary, including banging pots and pans together with a metal utensil.”

- Materials provide some teacher guidance on questioning to deepen student thinking. In the *Teacher Textbook - Grade 2 Science*, Science is a Verb section, materials include the question, “Does everything change in the same way when you heat them?” Materials provide the suggested answer, “No, because the way that each looks after they are heated is different. The ice melted and turned clear. The crayons turned silky and glossy.” Materials do not include specific guidance for building on student thinking based on student answers.
- The *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition* states that book questions are provided for the teacher to ask the students. In chapter three, idea box 2 states, “Ask the students...Can they describe something they like about camping to share with the class?” In idea box 4, the teacher asks, “What would they be doing at 11 pm versus 11 am?” Materials do not include specific guidance for building on student thinking based on student answers.

Materials include teacher guidance on how to scaffold and support students’ development and use of scientific vocabulary in context.

- Materials include teacher guidance on how to scaffold understanding of scientific vocabulary. The *Teacher Textbook - Grade 2 Science* guides how to scaffold and support students’ development and use of vocabulary in the support sections of the Investigations. These sections guide teachers on how and when to use the vocabulary. It guides them to encourage students to use the glossary and the word walls to understand.
- The *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition* provides general guidance for teachers. For example, in Chapter 8, materials include vocabulary words such as *carbon dioxide*, *nectar*, *photosynthesis*, and *pollination* within the chapter story text. Materials provide a review in the vocabulary section in the last activity of the chapter.
- At the end of each topic, teacher guidance states, “Review the following words with the students using TPS vocabulary cards. The objective of this activity is not to be able to sound, spell, and read all the words, as many are complex, but instead for the students to understand their meaning(s) and recognize them when spoken. Refer to the Reading Guidance and Vocabulary sections in the Introduction for other information on the decoding of the words and methods in using the words to demonstrate spelling knowledge, phonetics, and print awareness.”
- The *Teacher Textbook - Grade 2 Science* provides general guidance for teachers on how to support students’ use of scientific vocabulary in context. For example, in the Matter and Properties chapter, a Support Section states, “Students should attempt to describe what they are talking about if their vocabulary is lacking. Help students build on their vocabulary.”
- Students review and apply the vocabulary words in the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition* within a variety of fill-in-the-blank and comprehension activities. Materials provide some teacher guidance in the *STEAM Activity Guide* to support students’ use of scientific vocabulary in context. In the *STEAM Activity Guide*, materials guide the teacher to add words to the vocabulary list in the chapter. Students will die-cut words and definitions and add them to their word organizers. Students add pictures to help them recall the meaning of the word.

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Materials provide teacher guidance on preparing for student discourse and supporting students in using evidence to construct written and verbal claims.

- Materials provide teacher guidance on preparing for student discourse. In the Teacher Reasoning Guide, Investigation and Reasoning, materials state that students will learn to think like a scientist and how to ask questions and find the answers. In the Planning Investigations, the guidance states that students should be able to communicate their results to the class and actively listen to other students during sharing and participation.
- The *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition* states, “Remind them to listen actively to others’ explanations to identify important evidence and engage respectfully in scientific discussion.”
- Materials guide teachers in supporting students in using evidence to construct written claims. The front matter of the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition* states that materials include general guidance on preparing for student discourse and supporting students in using evidence to construct claims. It states that students should write about their experiments and they should include “the analysis of their results. Plan to discuss the results as a class and focus on key areas such as what their results indicate or mean and differences between different student experiments. What conclusions can be drawn?”
- The teacher textbook includes experiments focused on the content that guides teachers to have students use evidence to support their claims. For example, in a Force, Motion, and Energy lesson, students collect data and evidence about how much force is needed to make something move. After collecting evidence, the Teacher's Guide directs teachers to discuss how to use collected data to write a scientific conclusion.
- Guidance is also evidenced for STEM projects appearing in the program within the information in the teacher program guide stating 'This approach is referred to by the acronym “DAPIC” - Define, Assess, Plan, Implement, and Communicate. Likewise, communication may be necessary at any stage of the problem-solving process. The DAPIC model allows for all of these variations.
- Materials provide teacher support in preparing students to engage in discourse. For example, the Scientific Method and Design engineering process section contains multiple guidance comments regarding discussions. The Comprehension Skills sections contain guidance on discussion and argumentation. For example, idea boxes are cited throughout the text as points of collaborative discussion, engaging the children in the topic. The idea boxes are designed to promote questions from the text they have listened to, provide opportunities to evaluate details, and synthesize and share predictions and inferences This allows a child to modify their understanding of the text read, discuss topics, and determine the basic theme using text evidence.

Materials support and guide teachers in facilitating the sharing of students’ thinking and finding solutions.

- Materials provide general guidance for teachers in facilitating the sharing of students’ thinking. In the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*, the materials guide the teacher to encourage the students to share what they learned with the class and engage in scientific discussion.
- In the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*, chapter 2, teachers work with students to develop a composition that delivers answers to their questions. Materials direct teachers to “use the Creating and Editing Drafts section in the Introduction for guidance.

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Students listen actively to others' explanations, identify important evidence, and engage in scientific conversation.”

- Materials provide support and guidance for teachers in facilitating the sharing of students' finding solutions. Specific guidance is provided about communication in the *Teacher Textbook - 2nd Grade Science*. It states “Effective science communication is central to education, discussion and scientific argumentation. Not all scientists agree on everything, and when they disagree it is important that they can effectively use data, and current scientific ideas to communicate their reasons for their disagreements. Sometimes scientists must communicate complex ideas to the public. Most members of the public have a lower scientific understanding than a professional scientist, and therefore when communicating with the public it is important to deliver information in a way that can be easily understood. Encourage students to think about what they have learned in today's lesson and discuss the different ways in which they could communicate what they have learned. You might instruct the class to write a newspaper article, create an educational video, or deliver a presentation. Discuss with students the importance of considering their audience when constructing their presentation. Students may create presentations to deliver to the teacher, each other or their parents/carers. Presentations may be delivered individually or collaboratively”. Misconceptions are also provided.
- In the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*, Chapter 5, Activity 4, the teacher is to refer to the Creating and Editing drafts section to guide students on delivering their evidence. The Creating and Editing Drafts section suggests that students help plan drafts by drawing ideas or creating a mind map. Drafts should be revised and edited.

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Indicator 6.1

Materials include a variety of TEKS-aligned and developmentally appropriate assessment tools.

1	Materials include a range of diagnostic, formative, and summative assessments to assess student learning in a variety of formats.	M
2	Materials assess all student expectations over the breadth of the course and indicate which student expectations are being assessed in each assessment.	M
3	Materials include assessments that integrate scientific concepts and science and engineering practices with recurring themes and concepts.	M
4	Materials include assessments that require students to apply knowledge and skills to novel contexts.	M

Meets | Score 2/2

The materials meet the criteria for this indicator. Materials provide a variety of TEKS-aligned and developmentally appropriate assessment tools.

Materials include a range of diagnostic, formative, and summative assessments that include formal and informal opportunities to assess student learning in a variety of formats. Materials assess all student expectations and indicate which student expectations are assessed. Materials include assessments that integrate scientific concepts and science and engineering practices with recurring themes and concepts. Materials include assessments that require students to apply knowledge and skills to novel contexts.

Evidence includes but is not limited to:

Materials include a range of diagnostic, formative, and summative assessments to assess student learning in a variety of formats.

- The materials provide multiple assessments in the *Assessment Guide - Grade 2 Teacher Edition*. This booklet contains traditional assessments and project-based assessments for TEKS covering the following concepts: scientific and engineering practices; force, motion, and energy; Earth and space; organisms and environments. For example, the *Assessment Guide* contains twelve formative and summative assessments that include traditional test questions and project-style application tasks related to learning about organisms and environments. The assessments for the Matter and its Properties chapter include multiple-choice questions, open-ended questions, and a performance task with a rubric. In the performance task, students design an experiment to test various objects for whether they absorb or repel water.
- Each chapter in the *Student Textbook - Grade 2 Science* includes a Focus Questions section and a Test Yourself section that serve as formative assessments. In the Earth and Space: Shape of the Land unit, the Focus Questions ask, “What could you do to reduce the impact of wind in your garden? What is a windbreak? What are levees or dikes usually made from?” The Test Yourself section has four multiple-choice questions asking, “What is an embankment along the shore of a body of water? What can be used to stop the wind? What is a good material for a levee? What do they use at construction sites to keep soil from moving?”

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- Materials provide diagnostic, formative, and summative assessment tools. The *Teacher Program Guide - Grades K-8 Science* contains a section called Support Notes for Teachers. Within the Support Notes for Teachers segment are frequently asked questions with answers. Question 4 in this document asks, "Where are the TPS diagnostic, formative, and summative assessment tools?" The responses state that for the Diagnostic assessments, "The interactive software tool provides automated grading for multiple choice questions; Benchmark tests (Level 1, 2 and 3 Assessments) in Online Library - Blackline Master."
- The *Teacher Program Guide - Grades K-8 Science* has a Progress Monitoring section that provides information on the four Benchmark tests included in the program. Materials direct teachers to use the Benchmark 1 test to assess prior knowledge and then use the Benchmark 2 test to assess mastery of taught TEKS. Benchmark 3 test can be administered as an end-of-term test, and Benchmark 4 is the end-of-year test. In this respect, Benchmark tests 1, 2, and 3 can be considered diagnostic and formative assessments, and Benchmark 4 can be considered a summative assessment. Materials provide formative and summative assessments in the Interactive Software Tool and Assessment Generator.

Materials assess all student expectations over the breadth of the course and indicate which student expectations are being assessed in each assessment.

- Materials indicate which TEKS are assessed across the breadth of the course. In the *Teacher Program Guide - Grades K-8 Science*, the Progress Monitoring section describes the Focus Questions, Performance Tasks with Rubrics, TEKS by Chapter assessment questions, and Assessment Generator. Under Performance Tasks with Rubrics, the materials state, "For each TEKS, a performance task with a rubric is provided. Grade students and enter results onto the report card." The By TEKS, Chapter assessment questions at the end of each chapter, and the materials note, "The major assessment tools are those in the Online Library - Assessment tools." Under Assessment Generator, the materials say, "Teachers can create, save and print assessments to include chosen TEKS and skill levels. The tests can be personalized by the student or by class. Manual grading is required."
- Materials include the Assessment Generator as an online tool for teachers. The Assessment Generator is categorized by grade level, question type, learner level, and TEKS, enabling the teacher to evaluate all student expectations. The online Assessment Generator can create assessments for any grade-level standard. The Benchmark Test tool available to teachers assesses all student expectations and indicates the expectations assessed at the top of each page.
- The materials include TEKS-aligned assessments that align the curriculum standards and student expectations to measure student understanding and mastery of the concepts and skills taught in the materials. The TEKS addressed and taught in that section or chapter are at the top of the page. It allows for quick reference and guidance for the teachers and students. For example, the Using Tools section has a step-by-step lesson plan and the TEKS that are the focus of the investigation at the top of each page in the book.
- Materials include a Learn By Doing Assessment Rubric. The resource lists the standard, where it is taught, a specific assessment question, a general assessment question, and a rubric to score students' answers. For 5.B, the specific question is, "After completing Chapter 3 Activity 10, ask the students to create a cause and effect for erosion observed on the table." The general question is, "Students can investigate and predict cause and effect relationships."

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Materials include assessments that integrate scientific concepts and science and engineering practices with recurring themes and concepts.

- Materials include assessments integrating scientific concepts and science and engineering practices with recurring themes and concepts. Examples can be found in the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*.
 - In Chapter 4, Changes in Physical Properties, students conduct an experiment to demonstrate changes in the physical properties of materials in Activity 8. Students draw how they would change the physical properties of materials using the equipment provided. Next, students discuss their changes and write sentences about whether their hypothesis was correct.
 - In Chapter 6, Activity 3, students compare freshwater to saltwater and use the Scientific Method outlined in the Introduction. Students observe objects, hypothesize if they will sink or float, and explain why. Students test the objects in freshwater and saltwater and discuss their findings.
 - In Chapter 8, students act like scientists to experiment on growing plants to determine their needs. Students label a plant's roots, stems, leaves, flowers, fruits, and seeds and explain how each helps the plant meet its basic needs.
- In the *Teacher Textbook - Grade 2 Science*, the materials include assessments that integrate scientific concepts and science and engineering practices in the Combining Materials investigation. The students construct a strong bridge using at least two materials, using any materials they wish.

Materials include assessments that require students to apply knowledge and skills to novel contexts.

- Material includes assessments that require students to apply knowledge and skills to novel contexts. In the Assessment Guide, Force, Motion, and Energy, Performance Task, students use equipment provided in class to show the effects of two different strengths or directions of pushes or pulls to make a standing object start moving or move differently after students have completed activities on magnets in the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*. Students also create a ramp to observe how items move down and how students can change the motion. In the *Assessment Guide - Grade 2 Teacher Edition*, students roll toy cars down ramps to compare the speeds of cars.
- The materials include assessments that require students to apply knowledge and skills to novel contexts in the *Assessment Guide*. This program component provides activities separate from the lessons in the other components. This structure allows for assessment within the topic of study but in a new context. For example, in Grade 2, students investigate and describe how wind and water move soil and rock particles across the Earth's surface while studying Earth and Space. The students participate in a lesson on the science related to the Shape of Land, answer focus questions, conduct two investigations, and complete a Test Yourself quiz. The *Assessment Guide* provides summative open-ended questions, including, "Why are large numbers of trees often planted on slopes of hills or by rivers and lakes?" It also provides five tasks for students to apply what they have learned, including multiple-choice questions and additional open questions to assess knowledge.

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Indicator 6.2

Materials include guidance that explains how to analyze and respond to data from assessment tools.

1	Materials include information and/or resources that provide guidance for evaluating student responses.	M
2	Materials support teachers' analysis of assessment data with guidance and direction to respond to individual students' needs, in all areas of science, based on measures of student progress appropriate for the developmental level.	PM
3	Assessment tools yield relevant information for teachers to use when planning instruction, intervention, and extension.	M
4	Materials provide a variety of resources and teacher guidance on how to leverage different activities to respond to student data.	PM

Partial Meets | Score 1/2

The materials partially meet the criteria for this indicator. Materials include some guidance that explains how to analyze and respond to data from assessment tools.

Materials provide information and/or resources that provide guidance for evaluating student responses. Materials partially support teachers' analysis of assessment data with guidance and direction to respond to individual students' needs, in all areas of science, based on measures of student progress appropriate for the developmental level. Assessment tools yield relevant information for teachers to use when planning instruction, intervention, and extension. Materials provide some resources and teacher guidance on how to leverage different activities to respond to student data.

Evidence includes but is not limited to:

Materials include information and/or resources that guide evaluating student responses.

- Materials provide information and/or resources for evaluating student responses in most program components. This information generally appears in red font in teacher-facing resources, such as in the *Teacher Textbook - Grade 2 Science*, which provides guidance in red text for evaluating student responses to every activity/question.
- The *Learn by Doing STEAM Reader Book - Grade 2 Teacher Edition* contains sample student responses to questions investigated during a culminating activity for the content TEKS under the Assessment section. This component also includes the Learn by Doing Assessment Rubric - Grade 2 as a resource for evaluating student responses. Materials include an assessment question or task followed by sample responses that determine mastery.
 - For example, following Chapter 1, Activity 3, materials direct the teacher to “ask the students to explain why some objects moved faster vs. others moving slower down the ramp.” Teachers use the rubric to evaluate student responses as demonstrating some proficiency, approaching mastery, or mastery.
 - After reading Chapter 4, materials guide teachers to ask the students to describe the physical properties of different objects verbally. The rubric provides information for evaluating responses, stating that students with some proficiency will be able to describe most of the physical attributes with significant teacher prompting, students

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approaching mastery can describe most physical properties with some prompting, and students with mastery can describe most of the physical properties with no prompting.

- For example, in a task where students draw a house that uses solar energy, a three-point score is achieved if “a workable design is produced, based on accurate scientific principles, i.e., large windows positioned to take full advantage of the Sun throughout the day. Reference is made to the time, constraints of materials involved in the design, and the environmental benefits of solar energy.”

Materials support teachers' analysis of assessment data with guidance and direction to respond to individual students' needs, in all areas of science, based on measures of student progress appropriate for the developmental level.

- Materials support teachers' analysis of assessment data but lack guidance and direction for responding to individual student's needs based on that analysis.
 - For example, while the Graded Assessment Database offers three levels (Below, At, and Above) to determine measures of student progress, materials lack teacher guidance and direction for using this assessment data to respond to students' needs.
 - The materials include an Assessment Matrix that lists the knowledge statements for core concepts to support tracking overall data for students but lack accompanying teacher guidance for utilizing data in the matrix to drive instruction.
 - The materials contain Intervention Focus Tutorial materials to assist students who are not meeting expectations, but this tool is not directly aligned with assessment data. Materials lack teacher guidance and direction for teachers to use the Intervention Focus Tutorial in response to their analysis of assessment data.
 - The *Assessment Guide - Grade 2 Teacher Edition* offers a range of tools for evaluation and questioning, including multiple-choice and open-ended questions and performance tasks. However, it lacks support materials or resources to help teachers easily analyze and interpret the data they collect.
- Materials lack specific guidance documents and resources to support teachers' analysis of assessment data. The *Teacher Program Guide - Grades K-8 Science* provides a series of actions to take in response to student data that is limited to assigning new assessment questions (higher or lower level depending on student performance), addressing vocabulary, or assigning an art project. This blanket approach within the general teacher guidance document does not meet students' individual needs, which are often more complex.

Assessment tools yield relevant information for teachers to use when planning instruction, intervention, and extension.

- Materials provide various assessment tools and resources, including embedded questioning in student materials, an assessment guide, and an online assessment generator that can be used to support teachers when planning instruction, intervention, and extensions. The information gathered from the assessment tools helps teachers when planning core science and differentiated instruction. The Assessment Generator online tool can be used to create a custom assessment. The *Assessment Guide - Grade 2 Teacher Edition* offers a range of tools for evaluation and questioning, including multiple-choice and open-ended questions and performance tasks.

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- In the *Teacher Program Guide - Grades K-8 Science*, the information provided states, “Level 1 learners will require more time and content from STEM and art projects in conjunction with story books.” Level 2 students must follow the original scope and sequence and work on additional projects at home. Level 3 students continue the scope and sequence and can complete the advanced learner content and advanced STEM projects. Benchmark tests determine levels.
- The information gathered from the assessment tools helps teachers plan differentiated instruction. For example, the Learn By Doing Assessment Matrix categorizes students into three proficiencies: Some Proficiency, Approaching Mastery, and Mastered. Also, teachers can use Benchmark and other assessment data to assign below-grade level students Level 1 questions from the Assessment Generator, locating appropriate questions by TEKS, as stated in the *Program Guide*.

Materials provide a variety of resources and teacher guidance on how to leverage different activities to respond to student data.

- Materials provide a variety of resources but lack teacher guidance on how to leverage different activities to respond to student data. Examples of resources included in program components that teachers can leverage in responding to student data include the *Learn By Doing STEAM Activity Reader Book*, the *Student Textbook - Grade 2 Science*, the *Student Journal - Kindergarten Science*, the *STEAM Activity Guide*, the *Assessment Guide - Grade 2 Student Edition*, and the Intervention Focus Tutorial. For example, in the *Learn by Doing Steam Activity Reader*, Chapter 6, students have five activities they can complete. In Activity 4, the students will create a composition about a snow day. In Activity 5, students review vocabulary words. However, materials lack guidance on how to leverage activities for students below level.
- The *Teacher Program Guide - Grades K-8 Science* offers general guidance for using different activities to respond to student data. “Level 1 learners will require more time and content from STEM and art projects in conjunction with story books.” Level 2 students must follow the original scope and sequence and work on additional projects at home. Level 3 students continue the scope and sequence and can complete the advanced learner content and advanced STEM projects. Additional guidance in this resource directs teachers to “grade and insert results” for “Focus Questions” and “Performance Tasks” onto the report card.
- The *Assessment Guide - Kindergarten Teacher Edition* offers review activities, performance tasks, and reteach assessments to assist teachers with interventions. However, there is no guidance for which activities are used for which students at what time. Additionally, Support Matrices provide teachers with guidance on materials to use when supporting students. The materials do not provide guidance on which specific lessons or activities from the *STEAM Activity Guide* should be used for level 1 students who score Some proficiency on the Learn By Doing Assessment Rubric.

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Indicator 6.3

Assessments are clear and easy to understand.

1	Assessments contain items that are scientifically accurate, avoid bias, and are free from errors.	M
2	Assessment tools use clear pictures and graphics that are developmentally appropriate.	PM
3	Materials provide guidance to ensure consistent and accurate administration of assessment tools.	M
4	Materials include guidance to offer accommodations for assessment tools that allow students to demonstrate mastery of knowledge and skills aligned to learning goals.	PM

Partial Meets | Score 1/2

Materials partially meet the criteria for this indicator. Assessments are somewhat clear and easy to understand.

Assessments contain items that are scientifically accurate, avoid bias, and are free from errors. Assessment tools sometimes use clear pictures and graphics that are developmentally appropriate. Materials provide guidance to ensure consistent and accurate administration of assessment tools. Materials include some guidance to offer accommodations for assessment tools that allow students to demonstrate mastery of knowledge and skills aligned with learning goals.

Evidence includes but is not limited to:

Assessments contain items that are scientifically accurate, avoid bias, and are free from errors.

- Assessments for the grade level contain items that are scientifically accurate, avoid bias, and are free from errors. Materials accurately and correctly present content and concepts for the grade level. Formative and summative assessments include items that present content and examples fairly and impartially with no impact on student performance based on such factors as a student's home language, place of origin, gender, or race and ethnicity. This is evident in the Assessment Generator, which provides TEKS-aligned assessments, and the range of assessments in the *STEAM Activity Guide - Grade 2 Teacher Edition*.
 - For example, some assessment items are relatable to all students, such as an item in the Force, motion, and energy assessment questions that direct students to "Think about some of the toys and games in school or at home that you like playing with. Name two activities that involve pushing and two which involve pulling."

Assessment tools use clear pictures and graphics that are developmentally appropriate.

- Assessment tools often use unclear pictures and graphics and lack realistic photographs to assess student learning. The Assessment Database uses clipart images in assessment items that make the content presented and required tasks unclear to Grade 2 students. The *Assessment Guide - Grade 2 Student Edition* contains some pictures and graphics, with most of the material being text-based and not developmentally appropriate.

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- For example, when asking, “Look at the images. What 2 categories would you separate these into, and how many are in each category?” materials include unlabeled clipart images of seven small brown animals with legs and twelve brown fish-shaped items.
- In one assessment item, the materials ask students to look at a picture and decide what part of the animal helps it find its food in the dark. The answer, “big eyes,” is unclear due to the intricate image, in which students are unable to make out the bird's eyes.

Materials provide guidance to ensure consistent and accurate administration of assessment tools.

- Materials provide guidance to ensure consistent and accurate administration of the various assessment tools included in program components. The Progress Monitoring section of the *Teacher Program Guide - Grades K-8 Science* provides guidance on when to administer certain assessment tools. The product has four benchmark tests and guidance for when to give each benchmark. For example, “Benchmark 1 test - to assess natural knowledge at the commencement of term before any program content being taught.” Materials guide the teacher on when to administer benchmarks 2-4 throughout the year.
- Materials provide guidance for the administering items in the Assessment Database tool. The Assessment Database entry screen provides options for teachers to select TEKS-aligned questions, choose the level of questions, and show the answers. Items in the database offer directions for multiple audiences. For example, item #1 states, “What is a question you might ask about a frog’s life cycle?” while #48 says explicitly, “Work alone. What might you need to get a wheelchair off a bus?” Another item, #45, tells students to work in pairs..
- The *Teacher Program Guide - Grades K-8 Science* provides information on administering and scoring questions from the Assessment Generator. After completing activities in each chapter of the *Learn By Doing STEAM Activity Reader Book*, materials state that “teachers will assess students using Level 1 and 2 questions from the Online Library - Assessment generator or Online Library - Interactive software tool....These results should be added to the assessment matrix.”
- The *Teacher Textbook - Grade 3 Science* provides guidance for administering visual assessments. Materials state, “The Creative Science Curriculum encourages two types of assessment: visual lesson plan activities and quizzes/tests.” Materials state that teachers can conduct visual assessments by “watching students perform activities, such as found in STEM Project Editions or Arts Projects.” Materials provide a progress monitoring matrix and scoring rubrics to ensure consistent and accurate administration of visual assessments.

Materials include guidance to offer accommodations for assessment tools that allow students to demonstrate mastery of knowledge and skills aligned to learning goals.

- Materials lack guidance to offer accommodations for assessment tools that allow students to demonstrate mastery of knowledge and skills aligned to learning goals. For example, materials lack suggestions for time, scheduling, or setting accommodations that would allow students of varied needs and abilities to demonstrate grade-level mastery.
- Materials offer a wide range of assessments, allowing students to demonstrate mastery of knowledge and skills aligned to learning goals in various ways, including open-ended responses, projects, performance tasks, and multiple-choice questions. However, materials lack guidance for accommodating students with linguistic, neurodivergent, or other needs on assessments throughout the program.
- Materials include a means to differentiate assessments according to ability level in the Assessment Generator and provide guidance for using the leveled questions feature in the

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Teacher Program Guide - Grades K-8 Science. This tool allows teachers to select items above or below grade level that align with the standard. While this tool offers a differentiated assessment option that changes the expectation for students to demonstrate mastery but does not give guidance to offer accommodations on assessment tools included in the program.

- For example, an on-level question asks, “How is sound made?” The below-grade level question is the same but adds multiple-choice stems and the prompt, “Remember that everything is made of particles/matter.”

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Indicator 7.1

Materials include guidance, scaffolds, supports, and extensions that maximize student learning potential.

1	Materials provide recommended targeted instruction and activities to scaffold learning for students who have not yet achieved grade-level mastery.	M
2	Materials provide enrichment activities for all levels of learners.	M
3	Materials provide scaffolds and guidance for just-in-time learning acceleration for all students.	M

Meets | Score 2/2

The materials meet the criteria for this indicator. Materials include guidance, scaffolds, supports, and extensions that maximize student learning potential.

Materials provide recommended targeted instruction and activities to scaffold learning for students who have not yet achieved grade-level mastery. Materials offer enrichment activities for all levels of learners. Materials provide scaffolds and guidance for just-in-time learning acceleration for all students.

Evidence includes but is not limited to:

Materials provide recommended targeted instruction and activities to scaffold learning for students who have not yet achieved grade level mastery.

- Materials give an overview of recommended targeted instruction and activities to scaffold learning for students who have not yet achieved grade-level mastery in the Support Notes for Teachers section of the *Teacher Program Guide - Grades K-8 Science*. Here, materials state: “TPS has provided supplements that can be used for after school, reteaching, or additional homework.” The document notes the inclusion of the Learn By Doing Activity Reader Book RTI Scope and Sequence, which provides an alternate pacing plan for each grade level. It also states that STEAM activities “act as reteach tools for students who did not master the content with the first two components,” instruction provided through the *Learn by Doing STEAM Activity Reader Book* and textbook lessons for the grade level.
- The Support Notes for Teachers also recommend using the Online Library - Assessment Tools with “students who remain below grade level” or a “student who responds incorrectly.” In these situations, teachers can “choose Level 1 assessment questions for the TEKS being taught...and discuss answer given with student. Determine if there is a misconception and resolve.” The guidance emphasizes the role of *science language* in causing student misconceptions and recommends that teachers use the science glossary cards provided in the Online Library to review word meanings and use them with students.
- When students struggle with grade-level concepts, materials recommend using the Intervention Focus Tutorial for current and previous grade-level TEKS. Materials state: “Teachers can use more or less of the leveled materials to suit the individual student’s progression. For example, if students are working below or far below grade level due to reading, teachers can use the intervention focus tutorial and choose the grade and appropriate TEKS content that should have been mastered in an earlier grade but was not.”

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- Materials include teacher guidance for scaffolding instruction during lessons under the Support headers in the *Teacher Textbook - Grade 2 Science*. This guidance is sometimes generalized for all students and not specific to students with learning gaps. For example, in the Making Changes lesson, materials state: “Some students will be confused by the idea that a material remains the same even after you have altered it by actions such as cutting or melting. This is something they can only really learn from experience. However, you could reinforce the idea by having them cut paper and then reorganize the pieces to form the original sheet, and by further investigation of melting and freezing.”
- Materials also include a Scaffolding section for each lesson in the *Teacher Textbook - Grade 2 Science*, which lists previous and future TEKS to support students with gaps in grade-level knowledge, and a Support Matrix Document listing resources that align with each standard. In the Learn by Doing Scope & Sequence, RTI materials provide recommended targeted instruction and activities for each lesson from the STEAM storybooks.

Materials provide enrichment activities for all levels of learners.

- Materials provide Teacher guidance that encourages exploration and application of grade-level science knowledge and skills for all learners by applying new learning via STEAM activities in the STEAM Activity Guide. In the Happy Flowers project, students explore the effects of sunlight and water on a plant. Students plan and conduct their investigation versus a control. They also explore how animals and insects transport pollen and model their seeds. Students also apply their knowledge by inventing their plant and placing it in its perfect environment.
- Materials provide Teacher guidance that encourages all learners' exploration and application of grade-level science knowledge and skills by applying new learning via various activities in the Learn By Doing STEAM Activity Reader. In Chapter 3: Lost in the Forest, students first read about weather, sound, and light. Eleven different activities aligned to the content follow the reading, such as an experiment to test the effect of light on color perception, a math measurement activity, a rock observation and sort activity, and an engineering activity to design and build a device that uses sound to communicate.
- Materials provide enrichment activities for all levels of learners that account for learner variability. In the *STEAM Activity Guide - Grade 2 Teacher Edition*, teachers ask students to help create mind maps and write throughout the lessons. For example, in Matter and its Properties, materials suggest that students should write a description of the material and create a mind map of different things they want to include in their description. Materials offer partner discussions. For example, in the Learn by Doing Teacher Steam Activity Reader, the teacher and class will discuss the results of the activity.
- Materials provide a variety of enrichment activities for all levels of learners. In the Teacher Textbook, in the Project Based Lessons in the back of the book, there are enrichment activities for all levels of learners. Other extensions, like Math extensions, are embedded into the lessons. The STEAM Activity Guide has RLA and Math Connections at the end of the lessons to show how they are embedded. There is evidence of enrichment in the Activity Guide by integrating mathematical practice. The Teacher Textbook offers several opportunities for hands-on investigations and experiments that extend learning. There is an investigation into force and motion. The Teacher Textbook has opportunities to make science connections to math and literacy at the end of each unit.

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Materials provide scaffolds and guidance for just in time learning acceleration for all students.

- The materials provide scaffolds and guidance for just-in-time learning acceleration in the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*. Each chapter contains several *Idea boxes* within the text, giving the teacher prompts and cues to support student understanding. For example, Idea box 1 in Chapter 4, Zane’s Birthday Candles, states: “Compare and contrast the physical properties of water and candle wax at room temperature. Explain that the physical properties are characteristics of a solid, gas or liquid that can be determined by using your senses, (eyes, ears, fingers, noses, and finally by taste). Pass the students samples of solid and liquid water and candle wax and ask the students to consider texture, hardness, color transparency, smell and form. Ask the students about the physical properties of solid ice and wax and how they are different to liquid water and wax. Ask them how they would demonstrate a physical change for water or candle wax. Emphasize that the physical change would just be melting and not burning.” Throughout the chapters, these supports serve a variety of instructional purposes outside of just-in-time learning acceleration, including supporting student engagement, helping teachers deliver instructions, and demonstrating scientific concepts.
- Just in time content is provided and detailed in the teacher program guide K-8 which advises the online materials available. In the Teacher Program Guide K- 8, under the Support Notes For Teachers, bullet three discusses how the goal of the program is for students to master all TEKS. If students are having a difficult time with concepts, it gives teachers guidance on how to address the students' needs. If students master the TEKS, guidance is also given on how to allow the student to progress and what level of questions to give the student on assessments.
- The materials contain teacher guidance regarding strategically targeting learning gaps during first instruction. For example, the materials offer a variety of support materials that can be utilized for varied learner needs, such as picture vocabulary cards and a simplified textbook found in the online resources.

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Indicator 7.2

Materials include a variety of research-based instructional methods that appeal to a variety of learning interests and needs.

1	Materials include a variety of developmentally appropriate instructional approaches to engage students in the mastery of the content.	M
2	Materials consistently support flexible grouping (e.g., whole group, small group, partners, one-on-one).	M
3	Materials consistently support multiple types of practices (e.g., modeled, guided, collaborative, independent) and provide guidance and structures to achieve effective implementation.	PM
4	Materials represent a diversity of communities in the images and information about people and places.	M

Partial Meets | Score 1/2

The materials partially meet the criteria for this indicator. Materials partially include a variety of research-based instructional methods that appeal to a variety of learning interests and needs.

Materials include a variety of developmentally appropriate instructional approaches to engage students in the mastery of the content. Materials consistently support flexible grouping (e.g., whole group, small group, partners, one-on-one). Materials support multiple types of practices (e.g., modeled, guided, collaborative, independent) and provide some guidance and structures to achieve effective implementation. Materials represent a diversity of communities in the images and information about people and places.

Evidence includes but is not limited to:

Materials include a variety of developmentally appropriate instructional approaches to engage students in the mastery of the content.

- Materials include a variety of instructional approaches that are developmentally appropriate. As seen in the Learn by Doing STEAM Activity Reader, in the idea boxes - in Chapter 3, Lost in a Forest. Students chart the weather for two weeks to gather and analyze data. There are teacher demonstrations and making connections. The STEAM Activity Guide has various instructional approaches to engage students. The teacher does classroom demonstrations; there are tasks where students use tools to measure and collect data and engage in collaborative learning activities.
- Materials engage students in the mastery of the content through various developmentally appropriate instructional approaches in the Learn by Doing STEAM Activity Reader. Chapter 6 includes teacher think-aloud in the idea boxes. Idea box 3 states, "Work with the students to mind map conservation ideas they could use to conserve and properly dispose of materials they use in the classroom." The chapter includes exploration with concrete and hands-on materials at the level of rigor for the course when students experiment with salt water and fresh water in Activity 6. In the STEAM Activity Guide, Rock Hard includes opportunities for students to engage in inquiry-based learning activities in a collaborative setting to create concrete problem-solving

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by setting a new flagpole. The lesson consists of authentic tasks in which students use tools to measure and observe throughout the process.

- The materials engage students in the mastery of the content through various developmentally appropriate instructional approaches. In the Learn by Doing Steam Activity Reader, Chapter 7, Activity 9, students will draw a food chain of producers and consumers using reference books for pictures. In the Steam Activity Guide, Organisms and Environment, students will look for birds and explain how part of their body helps them survive. Next, students write about it, draw pictures, or create mind maps.

Materials consistently support flexible grouping (e.g., whole group, small group, partners, one on one).

- Materials consistently support flexible grouping. In the Teacher Textbook, the materials consistently support flexible grouping—often in small groups, pairs, and whole classes. In the STEAM Activity Guide, there are many instances where the students are in pairs, small groups, and whole groups.
- Materials support a variety of instructional groupings in the Learn by Doing Activity Reader Book. The teacher reads the stories to the whole group. In Chapter 3, the teacher reads *Lost in a Forest* and demonstrates Activity 1 to the whole group. Students work in pairs to complete Chapter 3, Activity 10, in which the students investigate erosion using a stream table. Chapter 3, Activity 8 has students work in groups to observe, describe, and compare rocks.
- Materials consistently support flexible grouping. In the Learn by Doing STEAM Activity Reader, Chapter 7, Activity 7, students will discuss the outcome of their results with the class. In the Steam Activity Guide, Organisms and Environments, the students will form small groups and act out the life of a potato plant. They will research the potato plant and highlight its needs.

Materials consistently support multiple types of practices (e.g., modeled, guided, collaborative, independent) and provide guidance and structures to achieve effective implementation.

- Materials consistently support multiple types of practices (e.g., modeled, guided, collaborative, independent) but provide limited guidance and structures to achieve effective implementation for all TEKS. For example, in the lesson plan for Properties in *Teacher Textbook - Grade 2 Science*, materials provide modeling, guided practice, and group work, and independent work but lack guidance and structure to achieve effective implementation.
- In the *Teacher Program Guide - Grades K-8 Science*, the Support Notes for Teachers section provides an overview of each program component, its contents, and the recommended sequence of materials. Here materials detail how the program begins with the *STEAM Activity Reader Book* for teaching literacy with science and then directs teachers to use the textbook, including expository text, investigations, assessment materials, and literacy and math-connected challenges. The *STEAM Activity Guide* provides aligned STEM and arts activities and an engineering practice project. The Support Notes for Teachers in the *Teacher Program Guide - Grades K-8 Science* provides an overview of each program piece, what is in each piece, and the sequence of materials. However, the teacher materials do not specify how the program supports modeled, guided, and collaborative practice.

Is represent a diversity of communities in the images and information about people and places.

- Materials represent diversity in communities. The STEAM Activity Guide, the student edition, has a diverse representation through images and information. Throughout the Amelia Rose

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stories, there are males and females. There were different races, and there was a boy in a wheelchair.

- Materials represent diverse communities using images and information that are respectful and inclusive. The cover of the Learn By Doing STEAM Activity Reader shows an illustration of a diverse group of students. The three cartoon students are of multiple skin colors and genders, and one is in a wheelchair. The cartoon teacher is a female with tan skin and dark hair. The same characters are found in the reader's stories, as well.
- Materials represent diverse communities using images and information that are respectful and inclusive. In the Online Library - Scientists - Blackline Master K-8, there is a chart with named scientists and their ethnicity. For example, the materials list Dr. Helen Rodriguez Trias under the header Latinos. There is a note to use this list to assign research to students. The Online Library of Scientists contains fact sheets for many scientists from diverse backgrounds, including males, females, and multiple nationalities and ethnicities. Scientists include Alexander Graham Bell, Ernest Just, Isaac Newton, Jane Goodall, Katherine Johnson, Mae Jemison, Marie Daley, Mario Molina, Sally Ride, and Ynes Mexia.
- Materials represent diverse communities using images and information that are respectful and inclusive. A diverse group of students that represent multiple ethnicities is on the cover of the Learn by Doing Steam Activity Reader.

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Indicator 7.3

Materials include listening, speaking, reading, and writing supports to assist emergent bilingual students in meeting grade-level science content expectations.

1	Materials include guidance for linguistic accommodations (communicated, sequenced, and scaffolded) commensurate with various levels of English language proficiency as defined by the ELPS.	PM
2	Materials encourage strategic use of students' first language as a means to linguistic, affective, cognitive, and academic development in English.	M

Partial Meets | Score 1/2

The materials partially meet the criteria for this indicator. Materials partially include listening, speaking, reading, and writing supports to assist emergent bilingual students in meeting grade-level science content expectations.

Materials include some guidance for linguistic accommodations (communicated, sequenced, and scaffolded) not commensurate with various English language proficiency levels as defined by the ELPS. Materials encourage strategic use of students' first language for linguistic, affective, cognitive, and academic development in English.

Evidence includes but is not limited to:

Materials include guidance for linguistic accommodations (communicated, sequenced, and scaffolded) commensurate with various levels of English language proficiency as defined by the ELPS.

- Materials list the ELPS in the *Teacher Program Guide - Grades K-8 Science* and note that the content of program components is intended to align with both TEKS and ELPS for each grade level. The Program Components section lists ELL supports as a feature of each lesson in the *Teacher Textbook* and provides examples of excerpts from grade-level lessons. These excerpts indicate that the generic guidance to support ELL students within lessons does not correspond to language domains or proficiency levels. This overview document lacks further information on guidance for linguistic accommodations commensurate with various levels of English language proficiency as defined by the ELPS.
- Materials include guidance for linguistic accommodations under the ELL (English Language Learner) header at the end of each lesson in the *Teacher Textbook - Grade 2 Science*. For example, in the Grade 2 lesson, Tools, the materials list the following suggestions under the ELL header: "Ensure students understand the adjectives you are using to describe tools. Have students think about the words they can use to describe the different tools. Encourage students to think about prior experiences they have had in which they have thought about and discussed tools." Other lessons in the *Teacher Textbook* offer similar suggestions for supporting emergent bilingual students. For example, the Grade 2 lesson, Properties, directs teachers to "Encourage students to use their prior knowledge and experiences to understand the meanings of new vocabulary" and "Monitor student spoken English as they reply to questions or take part in discussions." The Patterns in the Sky lesson includes suggested lesson adaptations for ESL/Reinforcement: "Pass out blue construction paper and silver stars. Have students make star

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constellations of their own, or copy them from the night sky, library books, or web research. Have students create picture flashcards for star, constellation, Earth, and Sun.” While these suggestions guide teachers toward supporting emergent bilingual students, the guidance is not consistently in line with providing linguistic accommodations and is not commensurate with various levels of English language proficiency as defined by the ELPS.

- Materials embed the ELPS as learning targets at the beginning of each “Amelia Rose Explores” section in the *STEAM Activity Guide - Grade 2 Teacher Edition*. For example, at the beginning of “Amelia Rose Explores Matter and its properties,” materials provide a table with several “cross-curricular second language acquisition/learning strategies,” including the following: “Use strategic learning techniques such as concept mapping, drawing, memorizing, comparing, contrasting, and reviewing to acquire basic and grade-level vocabulary. Speak using learning strategies such as requesting assistance, employing non-verbal cues, and using synonyms and circumlocution (conveying ideas by defining or describing when exact English words are not known).” Beyond the table listing learning targets at the beginning of these sections, this program component lacks guidance for providing linguistic accommodations within teacher guidance for using activities, science vocabulary, and narrative text.

Materials encourage strategic use of students’ first language as a means to linguistic, affective, cognitive, and academic development in English.

- Throughout the program components, materials encourage use of students’ first language and use it as a means to linguistic, affective, cognitive, and academic development in English. Materials primarily offer guidance on native language use through flashcards and translations, as well as some oral responses and discussions.
- Materials encourage the use of students’ first language in suggestions under the ELL headers in the *Teacher Textbook - Grade 2 Science*. These suggestions pertain to using Spanish glossary cards included in the program components and making flashcards in languages other than English. For example, ELL header guidance in two lessons, Tools and Scientific and Engineering Practices, states: “Use the Spanish glossary cards to assist relevant students.” In the Earth and Space Project-Based Lesson, ELL guidance states: “In every lesson, have students add to a science word wall. Have the English and foreign language word (if appropriate) made into flashcards. All students can learn translations using flashcards. The English version should remain on the wall until the end of each grade.” Similarly, guidance in the Weather Project-Based Lesson states: “For ELL students, have a second card with the English word on one side, and the foreign language word on the reverse.”
- Materials include strategies for supporting emergent bilingual students under the Tips for ELL Students headers in the *STEAM Arts Project Guide K-12* Grade 2 lessons. For example, the Teacher Text states, “If possible, have students work in collaborative groups where students share the same languages, and ideally, one student is advanced in English. Use visual and tactile models to illustrate elements of each activity and focus on the keywords. You can have students create a journal of words in their first language and in English.”

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Indicator 7.4

Materials guide fostering connections between home and school.

1	Materials provide information to be shared with students and caregivers about the design of the program.	M
2	Materials provide information to be shared with caregivers for how they can help reinforce student learning and development.	M
3	Materials include information to guide teacher communications with caregivers.	M

Meets | Score 2/2

The materials meet the criteria for this indicator. Materials guide fostering connections between home and school.

Materials provide information to be shared with students and caregivers about the program's design. Materials provide information to be shared with caregivers for how they can help reinforce student learning and development. Materials include information to guide teacher communications with caregivers.

Evidence includes but is not limited to:

Materials provide information to be shared with students and caregivers about the design of the program.

- The materials provide the *Family/Caregiver Guide - Grades K-8 Science*, which introduces the philosophy, research-based strategies, program components, assessment information, and a glossary for each grade. Within this resource, the Program Introduction explains the research behind the program content and describes the program's philosophy in easy-to-understand language for students and caregivers. This resource also includes an overview of the components and the sequence of materials intended to be used during instruction. It is available in a digital format for sharing with parents and caregivers.
- Materials include an overview of the *Family/Caregiver Guide - Grades K-8 Science* within the *Teacher Textbook - Grade 2 Science*. This information provides teacher guidance on sharing information about the curriculum with families and caregivers.
- The *Family/Caregiver Guide - Grades K-8 Science* details elements of the program and the purpose behind its design. One element described is practical approaches to teaching and learning science and the benefits of understanding how to "confront scientific arguments, advances, and associated technologies in their daily lives." The materials list everyday science applications that will support students as they grow. The guide continues to address TPS's pedagogical approach, "[using] storytelling as its main strategy," including a reference to research that says, "Students learn best when they enjoy the way a lesson is presented."
- Further, the *Family/Caregiver Guide - Grades K-8 Science* describes research-based strategies considered as TPS developed the program. The materials cite evidence such as "Social lessons improve student learning." and "Students learn in different ways, so the content must be presented that attaches the visual kinesthetic and auditory senses." The research references assist families with understanding the design of the program.

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- Additionally, the *Family/Caregiver Guide - Grades K-8 Science* includes links to online materials, and the section included in the *Teacher Textbook - Grade 2 Science* has a guide with the following sections: Program Introduction, Program Components, TEKS, ELPS, Explanation of TEA/SBOE process and [program] approach, Texas Resource Review requirements, Navigation Guide - Online Resource, Information about [program], Progress Monitoring, Family Visits and Teaching Pedagogy - Storytelling and STEAM.

Materials provide information to be shared with caregivers for how they can help reinforce student learning and development.

- Materials provide information for teachers to share with families/caregivers to help reinforce student learning and development. The Family/Caregiver Program Guide provides some resources and strategies for caregivers to reinforce student learning and development. It states, "Parents/caregivers can help enforce some of the requirements of the TEKS at home. The work you can complete with their children will vary between assisting students studying new TEKS content and explaining how it applies to home life and practical assistance with safety measures."
- The materials provide information for parents and caregivers about ways they can reinforce learning and development. For example, the materials include a document titled "How Teachers and Caregivers are Supported by STEAM Content," which provides introductory information and concrete ways caregivers can support learning at home. For example, the document provides the strategy, "Ask the students to define specific words and demonstrate them with an action or an example in a sentence."
- Materials provide information for teachers to share with families/caregivers to help reinforce student learning and development. TPS has created an additional guide, "How Teachers and Caregivers are Supported by the STEAM," to be shared with caregivers for how they can help reinforce student learning and development. The Teacher Textbook lessons include an "At Home" section with specific suggestions for home reinforcement. The Matter and Its Properties Lesson states, "At Home: Encourage your child to sort objects in terms of different properties. For example, ask them to separate fruits into groups of different colors or order a number of books by size."
- Materials provide some digital resources that teachers can share with families to reinforce learning and development. According to the Family/Caregiver Guide Grades K-8, in the Program Introduction, "TPS Publishing Inc. provides parent digital access for families to all homework assignments and the lists of keywords and definitions."

Materials include information to guide teacher communications with caregivers.

- Materials provide the Science Report Card as a teacher resource. This resource includes the following guidance for teacher communications with caregivers: "Please fill in the parent comment section so that we can work together to monitor your child's progress." The Science Report Card contains rows and columns for teachers to communicate student progress toward mastery of science and literacy standards according to four levels: Novice, Intermediate, Expert, and Not Yet Introduced.
- Materials include teacher guidance for communicating with caregivers in the *Family/Caregiver Guide - Grades K-8 Science*. This guidance includes advice for building relationships and sharing digital resources. For example, materials advise teachers to "provide digital access to caregivers at the start of each term" and suggest that teachers "hold a tutorial meeting in which the

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teacher can step the caregivers through the program, the digital tools, and the access they will receive to use at home.”

- The *Teacher Program Guide - Grades K-8 Science* offers additional information to guide teacher communication with caregivers, including suggestions for holding regular meetings and emphasis on the importance of actively working with caregivers. This guidance document states that “teachers may wish to ask various caregivers to come into the classroom to discuss how their job roles utilize various STEAM approaches” and affirms that doing so “will also enable caregivers to communicate with the students and feel valued within their child’s education.” It also guides teachers to “acknowledge and show gratitude for the time caregivers give to help the students.”

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Indicator 8.1

Materials include year-long plans with practice and review opportunities that support instruction.

1	Materials are accompanied by a TEKS-aligned Scope and Sequence outlining the order in which knowledge and skills are taught and built into the course materials.	M
2	Materials provide clear teacher guidance for facilitating student-made connections across core concepts, scientific and engineering practices, and recurring themes and concepts.	M
3	Materials provide review and practice of knowledge and skills spiraled throughout the year to support mastery and retention.	M

Meets | Score 2/2

The materials meet the criteria for this indicator. Materials include year-long plans with practice and review opportunities that support instruction.

Materials are accompanied by a TEKS-aligned Scope and Sequence outlining the order in which knowledge and skills are taught and built into the course materials. Materials provide clear teacher guidance for facilitating student-made connections across core concepts, scientific and engineering practices, and recurring themes and concepts. Materials provide review and practice of knowledge and skills spiraled throughout the year to support mastery and retention..

Evidence includes, but is not limited to:

Materials are accompanied by a TEKS aligned scope and sequence outlining the order in which knowledge and skills are taught and built in the course materials.

- The materials include a TEKS-aligned scope and sequence in the Teacher Support Guide online and in the *Teacher Textbook - Grade 2 Science*. This resource outlines the unit, TEKS, textbook reference page, and the number of class periods and revisions needed for each unit. The materials also include TEKS-aligned vertical alignment for grades K – 5 at the beginning of every chapter in the *Teacher Textbook*.
- The materials include a resource titled Pacing Plan/Year Planner, which outlines a suggested order of lessons in a calendar format. For example, it shows that Unit 1 – Scientific and Engineering Practice is recommended to be taught over twenty-one days, from August 20 to September 3.

Materials provide clear teacher guidance for facilitating student made connections across core concepts, scientific and engineering practices, and recurring themes and concepts.

- The materials provide year-long tools that indicate where teachers may find opportunities for facilitating student-made connections across core concepts, scientific and engineering practices, and recurring themes and concepts. For example, a grade-level scope and sequence outlines the instances where core concepts, SEPs, and RTS are present throughout program components. Additionally, the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition* contains an Appendix and Essential Content Guide, both outlining chapter contents and connections to

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science TEKS. The Appendix shows the science concepts covered in each chapter, and the Essential Content Guide shows which chapters align with a given science TEKS.

- The Science is a Verb category in the *Teacher Textbook - Grade 2 Science* includes a Teacher Guided Questions to Inquiry section for each lesson. These questions provide guidance for facilitating student-made connections. For example, materials provide the following questions for the lesson The Building Block Competition: “What can you build, then disassemble, and build again in a different shape? What properties of materials allow this to occur easily? How do builders use this concept effectively?” Additionally, teacher guidance states: “A house made of bricks is knocked down, and the bricks are reused to make a garden wall. What properties of brick make it a good choice for building houses and garden walls? How is the purpose of a house different to the purpose of a garden wall?” For each set of questions there is guidance in the Additional Hints section.
- Teacher guidance in the *Learn By Doing STEAM Activity Reader Book - Grade 2 Teacher Edition* supports facilitating student-made connections across scientific and engineering practices and recurring themes and concepts. For example, teacher guidance under the Scientific Method header for the first chapter states, “In many experiments there is an obvious cause and effect; for example, measuring the growth of a plant with or without light. With light (cause) the effect is to grow. When opportunities arise throughout the chapters or activities, discuss the link between a cause and effect.” Further guidance under the heading “Systems” helps facilitate student-made connections to cause and effect: “Where appropriate in each chapter, use an example to show a system and its dependence on its parts to be fully functioning,” and “Systems provide an opportunity to review cause and effect, for example, a car which is a sum of its parts.”

Materials provide review and practice of knowledge and skills spiraled throughout the year to support mastery and retention.

- The Pacing Calendar/Year Planner specifies dates for “revision, assessment, and reteach” after each unit. The Horizontal alignment chart shows teachers how knowledge and skills spiral throughout the year. Teachers can also view spiraling from other grades using the vertical alignment chart. .
- Materials also provide spiraled practice using the Assessment generator and Interactive software tools. This tool provides, by TEKS, by skill level questions. There is also an interactive software tool loaded with web-based auto graded questions and teachers can add their own content into this tool.
- Materials provide review and practice of knowledge and skills in the *Learn By Doing STEAM Activity Reader Book – Grade 2 Student Edition* to support mastery and retention. For example, in Chapter 1, Bend It Like Rosa, three activities promote mastery of the content.
- Materials include project-based lessons that incorporate multiple standards, including some previously taught. For example, the Shape of the Land lesson contains multiple standards.

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Indicator 8.2

Materials include classroom implementation support for teachers and administrators.

1	Materials provide teacher guidance and recommendations for use of all materials, including text, embedded technology, enrichment activities, research-based instructional strategies, and scaffolds to support and enhance student learning.	M
2	Materials include standards correlations, including cross-content standards, that explain the standards within the context of the grade level.	M
3	Materials include a comprehensive list of all equipment and supplies needed to support instructional activities.	M
4	Materials include guidance for safety practices, including the grade-appropriate use of safety equipment during investigations.	M

Meets | Score 2/2

The materials meet the criteria for this indicator. Materials include classroom implementation support for teachers and administrators.

Materials provide teacher guidance and recommendations for the use of all materials, including text, embedded technology, enrichment activities, research-based instructional strategies, and scaffolds to support student learning. Materials include standards correlations, including cross-content standards, that explain the standards within the context of the grade level. Materials include a comprehensive list of all equipment and supplies needed to support instructional activities. Materials include guidance for safety practices, including the grade-appropriate use of safety equipment during investigations.

Evidence includes but is not limited to:

Materials provide teacher guidance and recommendations for use of all materials, including text, embedded technology, enrichment activities, research based instructional strategies, and scaffolds to support and enhance student learning.

- The materials include guidance and recommendations in the *Teacher Program Guide – Grades K–8 Science*, with a program introduction, program components, TEKS, LEPS, and a navigation guide to online resources. Within the guide, materials provide an explanation of the different components and how they are used. This resource also includes teacher guidance for getting started with the material with embedded technology. For example, materials explain the use of materials such as online libraries, *Teacher Textbook* lessons, *Student Textbook* activities, and assessment tools.
- The materials are organized to facilitate ease of implementation and use. The *Teacher Textbook* contains an overview of the components similar to the Teacher Program Guide. When the lessons begin, an overview guide lists the TEKS taught, scaffolding information, objective, and misconceptions. Next, the lesson plan lays out the time that will be required, the materials needed, and the time estimation for each activity.
- The materials guide the *Learn by Doing STEAM Activity Reader Grade 2 Teacher Edition instructional strategies*. This book provides reading guidance, comprehension skills, and support

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for creating and editing drafts. It also includes teacher guidance for activities, vocabulary, the scientific method systems, the engineering design process, and safety in the classroom.

Materials include standards correlations, including cross content standards, that explain the standards within the context of the grade level.

- The materials include science standards correlations and cross-content connections for lesson units, lessons, and activities. In the *Teacher Textbook - Grade 2 Science*, the TEKS for each lesson is listed on the top of each page. The *STEAM Activity Guide - Grade 2 Teacher Edition* incorporates science with technology, engineering, art, and math cross-content connections. Each activity lists the science standards aligned to that lesson. For example, the “Window Shopping” lesson lists the science standards 2.6A, 2.6B, and 2.6C. In “The Weather Forecast” it lists science standard 2.10C. The materials also list five ELA/Literacy connections and three mathematics connections, but the specific TEKS are not identified. Word Wall activities also list the science standards aligned to that lesson.
- In the *Learn by Doing STEAM Activity Reader Book - Grade 2 Teacher Edition*, materials detail the ELA/literacy and mathematics connections but do not identify the aligned reading or math standards. In the Appendix of this component, the Essential Content Guide lists cross-content connections for ELA, math, and social studies without specific standards listed. This guide contains the chapter information and the content taught across science, math, and English language arts. For example, chapter 2 is about energy, light, and shadows. In addition, it contains design engineering design, counting and estimation, simple addition, communication of results, and vocabulary.

Materials include a comprehensive list of all equipment and supplies needed to support instructional activities.

- Materials provide a comprehensive list of equipment and supplies needed in the “STEAM into Science Grade 2 Textbook Kitting List,” which alphabetically lists all required materials to complete activities and investigations. A comprehensive materials list is also found in the online teacher support; the materials listed for the program are under the STEAM Science Kitting/Materials Catalog. There is also a grade level list under the STEAM Science Kitting/Materials List Grade 2.
- Materials are listed for each lesson. For example, in the *Teacher Textbook*, with each part of the lesson, there is a list of materials needed for that section. In the “How Does Warming Change a Material?” lesson, there are required materials needed for that lesson under the description. The Earth and Space lesson lists “Pictures of Saturn, Jupiter, and Venus, and drawing paper and coloring pens.”

Materials include guidance for safety practices, including the grade appropriate use of safety equipment during investigations.

- Materials include guidance for safety practices in the *Scientific, Investigation, and Reasoning Handbook – Grade 2*. The first lesson, “Working Safely and Responsibly,” reviews how to behave safely in science lessons.
- The *Learn By Doing STEAM Activity Reader Grade 2 Teacher Edition* lists a section titled “Safety in the Classroom.” It directs teachers to follow state and school safety guidelines.

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- The *Learn By Doing STEAM Activity Reader Book Grade 2 Teacher Edition* has a paragraph about safety. It is a general reminder to demonstrate safety practices described by TEA and follow school and district guidelines before conducting any investigation.

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Indicator 8.3

Materials provide implementation guidance to meet variability in program design and scheduling.

1	Materials support scheduling considerations and include guidance and recommendations on required time for lessons and activities.	M
2	Materials guide strategic implementation without disrupting the sequence of content that must be taught in a specific order following a developmental progression.	M
3	Materials designated for the course are flexible and can be completed in one school year.	M

Meets | Score 2/2

The materials meet the criteria for this indicator. Materials provide implementation guidance to meet variability in program design and scheduling.

Materials support scheduling considerations and include guidance and recommendations on required time for lessons and activities. Materials guide strategic implementation without disrupting the sequence of content that must be taught in a specific order following a developmental progression. Materials designated for the course are flexible but can be completed in one school year.

Evidence includes but is not limited to:

Materials support scheduling considerations and include guidance and recommendations on required time for lessons and activities.

- Materials include support for scheduling considerations, guidance, and recommendations on required time for lessons and activities. For example, the Texas Proclamation 24 Scope and Sequence provides suggestions for the number of minutes and class periods to spend on lessons. This information is available in the online resources. In the Online Library, the Teacher Support Learn By Doing Scope and Sequence RTI Grade 2 states that it provides an “alternate scope and sequence for RTI students.” Within this document, there is a “recommended duration of lesson/minutes.”
- The materials provide guidance and recommendations on the required time for lessons and activities. The Teacher Resource Guide includes a Pacing Plan/Year Plan. The guide only suggests what days to teach the units. The *Teacher Textbook* has a Scope and Sequence and a pacing calendar available. It also contains the recommended length of time for each lesson. The pacing calendar takes into account holidays and potential teacher work days.
- Materials include pacing suggestions for the grade level. For example, in the *Teacher Textbook*, pg. 60, there is guidance for the number of class periods required, time, and how many lessons are needed for reteaching and revision.

Materials guide strategic implementation without disrupting the sequence of content that must be taught in a specific order following a developmental progression.

- Materials guide strategic implementation. For example, the *Learn by Doing STEAM Activity Reader Book Teacher Edition* contains an essential content guide. The guide shows that the

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material begins with the material starts with Unit 1, “The World Around Us,” in which students learn safe science procedures about matter and physical properties. This builds into other units, such as Unit 2, Energy, Light and Shadows, and Unit 8, Spot is Alive, in which students apply the skills learned in Unit 1.

- Materials guide sequencing. For example, In the Online Resources, the Scope and Sequence illustrate that the units build upon each other in a specific sequence. Unit 1 begins with scientific and engineering practices, which will be applied throughout the other units.
- The materials contain lessons that build on each other. The first unit is the Tools unit. This unit introduces the tools used for the investigations in the following lessons.

Materials designated for the course are flexible and can be completed in one school year.

- Materials suggest ways to complete the curriculum in one school year. For example, in the Online Resources, the Scope and Sequence illustrate the materials can be achieved in 150 class periods of 50 minutes each.
- The materials provide alternative pacing for RTI students in the Teacher Support Learn By Doing Scope and Sequence RTI.
- Materials provide a Pacing Plan/Year Planner with a review of how it would fit into a “typical” single school year. The Pacing Plan/ Year Planner includes a complete August-May view reflecting how the course fits within a single school year. The STEAM Activity Guide includes a “vignette” activity and provides a day-by-day description of each activity. The breakdown informs teachers’ decisions to prioritize lesson components or adjust due to time constraints.

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Indicator 9.1

The visual design of materials is clear and easy to understand.

1	Materials include an appropriate amount of white space and a design that supports and does not distract from student learning.	No
2	Materials embed age-appropriate pictures and graphics that support student learning and engagement without being visually distracting.	No
3	Materials include digital components that are free of technical errors.	Yes

Not Scored

The visual design of materials is sometimes clear and easy to understand.

Materials do not include an appropriate amount of white space and a design that supports and distracts from student learning. Materials do not embed age-appropriate pictures and graphics that support student learning and engagement without being visually distracting. Materials include digital components that are free of technical errors.

Evidence includes but is not limited to:

Materials include an appropriate amount of white space and a design that supports and does not distract from student learning.

- Materials do not include an appropriate amount of white space and a design that supports and does not distract from student learning. While some student-facing program components in the materials include an appropriate amount of white space and a design that supports student learning, the core components do not. Additionally, Student-facing materials in the 2nd Grade program are more word-based than picture-based, which does not support learning for non-readers.
 - For example, the *Student Textbook - Grade 2 Science* is often text-heavy, lacking adequate white space and other design features to support student learning. Lessons in the textbook often contain closely spaced text with some graphic or text features. Chapters and lessons within the textbook lack clear titles that would help students navigate the various topics, activities, and sections.
 - For example, pages following traditional lesson, Tools, in the *Student Textbook - Grade 2 Science* present a table of keywords, which appear in bold, with single-spaced definitions. These pages present forty-five key words across four pages and lack an appropriate amount of white space and a design that supports learning for Grade 1 students. The following page, Key Words, appears to be intended as a summary and check for understanding but lacks formatting, text, and graphic features to grab student attention. It contains ample white space but lacks spacing between student-facing questions and introductory text.
 - Chapter titles in the *Learn By Doing STEAM Activity Reader Book - Grade 2 Student Edition* do not always identify the topic, and the topic is not identified elsewhere. For example, Chapter 1 is titled Bend It Like Rosa, and Chapter 3 is titled Lost in a Forest.

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Materials embed age appropriate pictures and graphics that support student learning and engagement without being visually distracting.

- The materials do not embed age-appropriate pictures and graphics that support student learning and engagement without being visually distracting. Materials frequently use unrealistic clipart rather than realistic pictures and graphics when presenting science content and concepts and embed fun and decorative pictures and graphics that visually distract students.
 - For example, in the How Do You Group Objects? lesson in the *Student Textbook - Grade 2 Science*, materials present nine images: a tennis ball, rubber bands, paper clips, a golf ball, a penny, an eraser, a magnet, a nail, a cartoon-shaped pencil, a hand holding a sheet of paper, aluminum foil, and a scale. Only the image of aluminum foil is a real photograph, and the other eight images are clipart.
 - For example, in Chapter 7 of the *STEAM Learn By Doing Activity Reader - Grade 2 Student Edition*, students read about animal needs, adaptations, and life cycles. Materials present fourteen images, of which three are photographs.
 - For example, in the *Science Picture Glossary Grade 2*, materials include three clipart images for the word *weather*: a swimming pool, a cartoon snowman, and a person holding an umbrella.

Materials include digital components that are free of technical errors.

- The materials include digital components that are free of technical errors.
 - For example, the *STEAM Activity Guide - Grade 2 Student Edition* includes activities that are free of inaccurate content materials or information, and the *Teacher Edition* is free of wrong answers to questions asked.
 - For example, teacher and student editions of digital textbooks included in the materials are free of spelling, grammar, and punctuation errors.

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Indicator 9.2

Materials are intentionally designed to engage and support student learning with the integration of digital technology.

1	Materials integrate digital technology and tools that support student learning and engagement.	Yes
2	Materials integrate digital technology in ways that support student engagement with the science and engineering practices, recurring themes and concepts, and grade-level content.	No
3	Materials integrate digital technology that provides opportunities for teachers and/or students to collaborate.	No
4	Materials integrate digital technology that is compatible with a variety of learning management systems.	No

Not Scored

Materials are somewhat intentionally designed to engage and support student learning with the integration of digital technology.

Materials integrate digital technology and tools that support student learning and engagement. Materials do not integrate digital technology in ways that support student engagement with science and engineering practices, recurring themes and concepts, and grade-level content. Materials do not integrate digital technology that provides opportunities for teachers and/or students to collaborate. Materials do not integrate digital technology that is compatible with a variety of learning management systems.

Evidence includes but is not limited to:

Materials integrate digital technology and tools that support student learning and engagement.

- The materials integrate technology and tools that support student learning and engagement. Materials include digital access to components, online assessments, tutorials, and digital technology.
 - For example, the Interactive Assessment Tool allows students to complete tests and quizzes online.
 - For example, the Intervention Focus Tutorial provides digital access to below-level, at-level, and above-level science TEKS for students needing differentiated instruction.
 - For example, the *Teacher Program Guide - Grades K-8 Science* outlines the digital components of the instructional materials and gives an overview of materials that can be accessed digitally.
 - For example, the Online Library includes NEST family videos and workbooks.
 - For example, materials include access to the TPS Alaska Library, which provides a coloring book and audio clips.
 - For example, the online platform contains digital versions of Reader Activity Books and digital photographs of tools.

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Materials integrate digital technology in ways that support student engagement with the science and engineering practices, recurring themes and concepts, and grade level content.

- Materials do not integrate digital technology to support student engagement with science and engineering practices, recurring themes and concepts, and grade-level concepts. While materials refer to online resources in lessons and activities and provide online assessments, the program lacks such digital technology components as demonstration videos or interactive labs that would support student engagement with the SEPs, RTCs, and grade-level content.

Materials integrate digital technology that provides opportunities for teachers and/or students to collaborate.

- The materials do not integrate digital technology that provides opportunities for teachers and/or students to collaborate. The materials indicate all online resources are separate links and not interconnected, thus preventing digital collaboration among students and teachers.
- Although the materials include online assessments in the Interactive Assessment Tool, they do not allow teachers and/or students to collaborate. The assessments are designed to be completed individually after they are printed in paper-based form by the teacher.
- The materials do not recommend platforms, links, or resources on how those digital suggestions can be accessible to students and teachers.
- The materials do not provide suggestions or resources for collaboration between teachers and students.

Materials integrate digital technology that is compatible with a variety of learning management systems.

- The materials do not integrate digital technology that is compatible with a variety of learning management systems, but do note that all digital materials are accessible via any computer or mobile device with the internet. The materials recommend internet use for many research-focused activities in student-facing materials.
- The *Teacher Program Guide - K-8 Science* states that digital technology within the materials is compatible with Clever but does not mention other learning management systems.

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Indicator 9.3

Digital technology and online components are developmentally and grade-level appropriate and provide support for learning.

1	Digital technology and online components are developmentally appropriate for the grade level and align with the scope and approach to science knowledge and skills progression.	No
2	Materials provide teacher guidance for the use of embedded technology to support and enhance student learning.	No
3	Materials are available to parents and caregivers to support student engagement with digital technology and online components.	Yes

Not Scored

Digital technology and online components are somewhat developmentally and grade-level appropriate and provide some learning support.

Digital technology and online components are not developmentally appropriate for the grade level and do not align with the scope and approach to science knowledge and skills progression. Materials do not provide teacher guidance for the use of embedded technology to support and enhance student learning. Materials are available to parents and caregivers to support student engagement with digital technology and online components.

Evidence includes but is not limited to:

Digital technology and online components are developmentally appropriate for the grade level and align with the scope and approach to science knowledge and skills progression.

- Digital technology and online components included in the materials comprise print-based content and resource materials in the Online Libraries and guidance to use the internet for web-based research and resources in student activities. Materials include the following in the Online Libraries: Assessment Tools, Reader Activity Books, Student Reasoning Library, Blackline Master Library, STEAM Library, and the Digital Frog Library. These resources and tools are consistent across the K-8 program and not specific to the grade level.
- The materials lack digital technology and online components outside of the digitized files of print materials. The online materials consist mostly of print-based materials being placed in an online viewer or images being available for display.

Materials provide teacher guidance for the use of embedded technology to support and enhance student learning.

- The materials do not provide teacher guidance for the use of embedded technology to support and enhance student learning.
 - For example, the materials lack teacher guidance for the use of embedded technology in the *STEAM Activity Guide – Grade 2 Teacher Edition*. Materials state, "Please refer to your school's computer safety policy for work that involves students using computers and the Internet."

TPS STEAM into Science Grade 2

- For example, materials provide a Crosscutting Library of photographs but lack teacher guidance for embedding these photographs within lessons and activities to enhance student learning.
- For example, while materials provide a video guiding teachers on using the interactive software tool and the assessment generator, this guidance is lacking for other components, such as the intervention focus tutorial. Materials do not include step-by-step instructions for setting up and using technology. Materials do not provide troubleshooting tips for common problems teachers may encounter.

Materials are available to parents and caregivers to support student engagement with digital technology and online components.

- Materials are available to parents and caregivers to support student engagement in online components. For example, materials state in the *Family/Caregiver Guide - Grades K-8 Science* that "TPS Publishing Inc. provides parent digital access to family to families for all homework assignments, and to the list of keywords and definitions." This document also includes guidance for parents and caregivers on the use of digital materials, including how to navigate digital textbooks and the Assessment Generator. This document allows parents and caregivers to support student engagement with such online resources as TPS glossary cards and the Intervention Focus Tutorial.
- For example, materials provide an e-letter that provides online access to materials, resources, and activities to reinforce student learning and development.