Great Minds PhD Science Texas Grade 2

Great Minds PhD Science Texas 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 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 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 educative components to support teachers' content and coherence knowledge.

Section 4. Productive Struggle

- The materials provide 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 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 guidance that explains how to analyze and respond to data from assessment tools.

- The assessments are 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 listening, reading, writing, and speaking supports to help Emergent Bilinguals meet grade-level science content expectations.
- The materials include a variety of research-based instructional methods that appeal to a variety of learning interests and needs.
- The materials include 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 classroom implementation support for teachers and administrators.
- The materials provide implementation guidance to meet variability in program design and scheduling.

Section 9. Design Features

- The visual design of materials is clear and easy to understand.
- The materials are mostly designed to engage and support student learning with the integration of digital technology.
- The digital technology or online components are developmentally and grade-level appropriate and 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 the recurring themes.	M
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

Meets | Score 4/4

The materials meet the criteria for this indicator. 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.

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

Evidence includes but is not limited to:

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

- The materials include multiple opportunities for students to develop, practice, and demonstrate mastery of grade-appropriate scientific practices as outlined in the Texas Essential Knowledge and Skills (TEKS). Lesson Clusters cite where each standard is introduced, addressed, and mastered. For example, TEKS 2.6A is introduced in Module 1, Lessons 1–3, addressed in Module 1, Lessons 4–30, and mastered in Module 1, Lessons 32–34. The module provides hands-on activities for students to practice and multiple checks for understanding to support mastery of TEKS 2.6A.
- The materials provide multiple opportunities to practice and show mastery of grade-level appropriate scientific and engineering practices as outlined in the TEKS. For example, in Module 3, Spotlight Lessons on Living Things, students arrange butterfly life cycle cards using the American bullfrog life cycle as a model. Students have the opportunity to show mastery of the

concept by revising and reorganizing their life cycle cards after listening to an article about the butterfly life cycle.
- Materials provide multiple opportunities for students to practice, develop, and demonstrate mastery of grade-level appropriate engineering practices as outlined in the TEKS. For example, TEKS 2.1G states, "Students will develop and use models to represent phenomena, objects, and processes or design a prototype for a solution to a problem." Throughout Level 2 Modules, students demonstrate these skills as they use a diagram of the inside of an ear to explain why an eardrum vibrates, build a prototype of a communication device, and use a model to revise an explanation that the Moon reflects light from the Sun.

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

- The materials provide multiple opportunities to make connections between overarching concepts and recurring themes. The Implementation Guide lists seven recurring themes, "...patterns, cause and effect, scale and proportion, systems, energy and matter, structure and function, and stability and change." For example, the recurring theme "structure and function" is found in Module 3 lessons about plants and in Spotlight Lessons about living things and their environments.
- The materials provide multiple opportunities to use recurring themes in making connections between and within overarching concepts. For example, in Module 3, Lesson 30, students answer the question, "How did using size and quantity help you understand this phenomenon?" The Teacher Note in the sidebar suggests the teacher "... help students reflect metacognitively on links between phenomena, ideas, concepts, and practices in science and engineering."

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

- The materials are systematically designed to develop and build student skills and content knowledge using phenomena appropriate to the grade level as outlined in the TEKS. The materials provide a Storyline that outlines the progression of each unit and essential questions that align with the TEKS. For example, in Module 3, students learn how the eruption of Mount St. Helens affected local plants. At the end of the module, students use investigation data to determine that different plants need different resources. Students use this knowledge to discuss plant recovery during a Socratic Seminar.
- Throughout the materials, students engage in a Content Learning Cycle to strategically and systematically build content knowledge and skills. According to the Implementation Guide, the five stages of the content learning cycle are "...wonder, organize, reveal, distill, and know." During the "Wonder" stage of the learning cycle, students ask questions and develop an initial explanation of the anchoring phenomenon. During the "Organize" stage of the learning cycle, students investigate various supporting phenomena to understand the anchoring phenomenon better. During the "Reveal" stage of the learning cycle, students return periodically to the anchoring phenomenon to apply evidence they gather during investigations and data analysis to revise their explanations. During the "Distill" stage of the learning cycle, students reflect on the conceptual understanding they have developed and used to explain multiple phenomena in a Socratic Seminar. During the "Know" stage of the learning cycle, students apply knowledge to explain a new phenomenon in the End-of-Module Assessment. Each time students participate in

the learning cycle, they engage in elements of the 5E instructional model to make sense of phenomena.

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.

- The materials include multiple opportunities for students to ask questions to drive investigations and knowledge acquisition. For example, in Level 2, Module 3, students generate questions about plants and plant growth around Mount St. Helens. The questions are recorded on sticky notes and placed on the Driving Question Board. During the module, "Students revisit the driving question board to build a coherent understanding of how plants were able to recover after the eruption."
- Materials include opportunities for students to conduct classroom, lab, and field investigations. In Module 2, students work in pairs to predict and test the effect of sound on a balloon. One partner holds a balloon while the other uses a pie tin to make a sound nearby. During the investigation, "...students observe that the sound of the pie tin causes the balloon to vibrate."
- The materials include sufficient opportunities for students to engage in problem-solving to make connections across disciplines and develop an understanding of science concepts. For example, in Module 3, students use math skills to develop an understanding of science concepts. In the Math Connection Sidebar, "...students use the information on the graph to compare numerical amounts between the blueberry plants in Group A and Group B."

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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.	M
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

Meets | Score 4/4

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

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 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 include a Curriculum Map that identifies anchor phenomena, supporting phenomena, and student-generated phenomena in each module. For example, the anchoring phenomenon in Module 3, Spotlight Lessons on Living Things, is Life in Big Thicket National Preserve.
- Materials embed problems across lessons to support students in developing knowledge through engineering practices. For example, in Module 1, students learn about bird nests and follow the engineering design process to build a shelter that provides protection from rain.
- Materials allow students to build knowledge of phenomena through authentic, grade-level application across lessons. For example, in Module 1, Lesson 4, students observe the properties of various samples of matter. In Lesson 5, students classify objects and materials by their observable properties and develop class descriptions of solids and liquids. In Lesson 7, students change the shape of objects and update their descriptions of solids and liquids.

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

- The materials provide multiple opportunities to leverage students' prior knowledge and experiences. For example, in Module 2, students reflect on prior knowledge that animals use their ears to hear before learning how sound travels.
- The materials include a "Launch" section to review learning from previous grade-level modules. For example, in Module 3, Lesson 3, the Teacher Note states, "In the Kindergarten Life Module, students learn that a shadow forms when an object blocks light from reaching a surface. Review this learning with students as needed. Then identify the light source as the flashlight, the objects as the students' bodies, and the surface as the floor in the current activity. Relate this activity to trees blocking sunlight from reaching the ground in a forest."
- Materials include a "Driving Question Board" where the essential question is revisited throughout the lesson. In Module 3, Lesson 2, students revisit the concept of plant survival in an environment with the Essential Question, "How did local plants recover after the eruption of Mount St. Helens?" Materials suggest the teacher should, "Revisit student's prior learning to add or update their questions and answers."

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

- The materials include a Pacing Guide with the anchoring phenomenon, an essential question, a goal statement, and TEKS alignment for each cluster. For example, in Module 1 Pacing Guide, the anchoring phenomenon is Birds Building Nests, and the essential question is, "Why do different kinds of birds use certain materials to build their nests?"
- The materials include an "Introduction Section" to introduce phenomena and recurring themes that engage students in science content. For example, in the Module 3 Spotlight Lesson, students explore how animals meet their needs for survival and answer the essential question, "How many kinds of animals live in Big Thicket National Preserve?" Students identify how the physical characteristics of environments determine where animals live.
- Materials include an "Introduction" to identify the purpose and goal of anchor phenomena and scientific concepts in the module. For example, Module 3 states, "...through these experiences, students develop an enduring understanding that different kinds of plants have different needs for growth and depend on certain interactions for pollination and seed travel."

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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 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 within and across units and grade levels. The Texas Essential Knowledge and Skills (TEKS) Content Development Progression identifies when TEKS are developed and mastered. For example, kindergarten students observe and describe weather changes (K.10B), in first grade, they will describe and record observable characteristics of weather (1.10D), and in second grade, students will measure, record, and graph weather information including temperature and precipitation (2.10.B).
- The materials provide a Spotlight on Knowledge and Skills section to describe how lessons are vertically aligned and designed for students to build and connect their knowledge and skills within and across units. For example, in Module 2, Lesson 14, the materials state "In Level 1, students explore plant and animal body parts and learn that humans and other animals use their ears to hear. Consider connecting to student knowledge about animal body parts during this discussion."
- The materials present content in a way that builds in complexity within and across units and grade levels. The progression of complexity through each module is described in narrative format in the "Introduction" section. Students begin learning that different plants need different amounts of natural resources and end the module learning about pollination and seed travel.

Materials describe how students will continue connecting knowledge across the unit, stating "...in later lessons, they will learn more about how the amount of water in an area can affect plant growth."

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

- The materials include a progression of concrete then representational before abstract reasoning when presenting concepts that allow for increasingly deeper conceptual understanding. For example, in Module 3, students explore plant growth under different water and light conditions. Students conduct an investigation to determine if plants need different amounts of natural resources and analyze data to determine patterns. Through this intentional learning sequence, students apply this knowledge in a Socratic Seminar to discuss how plants were recovered after the eruption of Mount St. Helens.
- Materials are intentionally sequenced to include Engineering Challenges which scaffold learning in a way that allows for increasingly deeper conceptual understanding. In Module 2, Sound, students observe sets of instruments in the classroom and explore the effects of sound through an Engineering Challenge. Students design and build a device that a teacher can use to communicate two different messages during recess. Through this intentional sequencing, “...students determine that instruments make sound when their parts vibrate, or move back or forth very fast (2.8A)."
- The materials sequence instruction in a way that activates or builds prior knowledge before explicit teaching occurs that allows for increasingly deeper conceptual understanding. The Launch component of each lesson provides students to identify what they already know about a concept or phenomena before starting the lesson. For example, in Module 3, Lesson 9, students watch a video of a bee landing on flowers and respond to the question "Why do you think the bee is landing on the flowers?" The teacher then reads, "Honey Bees Knowledge Deck Poster” and revisits the initial question, "Now why do you think the bee in the video is landing on the flowers?"

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

- Materials present scientific content that reflects the most current and widely accepted explanations and are free of scientific inaccuracies. The Teacher's Edition provides Teacher Note sidebars with clarifying information related to science terms and concepts. For example, in Module 3, Lesson 1, the Teacher Note provides insights into the cultural and historical significance of Mount St. Helens. The note states "The US National Park Service has listed Mount St. Helens on its National Register of Historic Places since 2013. The volcano has cultural and historical significance to the people of the Confederated Tribes and Bands of the Yakama Nation. Consider providing the traditional Cowlitz language name for the site, Lawetlat’la , which translates to “smoker,” and explaining how this name relates to volcanic activity. For more information, visit this US Forest Service web page (http://phdsci.link/1621)."
- The materials accurately present core concepts, recurring themes and concepts, and science and engineering practices. For example, in Module 3, students learn about plant parts. Materials include accurate information about seeds, noting, "... a seed is a plant part that can grow into a new plant." The materials also explain that seeds can look different and still grow into plants. The Teacher Note sidebar in Lesson 4 gives guidance to clearly present information, stating, "To

aid in student comprehension and avoid misconceptions during discussions about plant growth, use the terms fava bean plant and fava bean seed."

- The materials clearly present science practices through the 7E Model. In the Explore phase "...students plan and conduct investigations, collect and record information and data from observations, analyze and interpret data, represent the natural world by using models, construct explanations, and propose solutions." In Module 3, Lesson 9, students observe a bee pollinating a flower in a video. Students share their observations and explain how the bee interacts with the flower. Students use real flowers and model how insects interact with different parts of the plant.

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

- The materials provide mastery requirements within the boundaries of the grade level. For example, the Implementation Guide provides a Texas Essential Knowledge and Skills (TEKS) Content Development Progression component that outlines when learning targets are expected to be mastered in grade 2 and standards that students will develop in future lessons. Within the component, the bold text identifies standards students should master, and italicized text identifies standards students will master in later lessons. For example, in TEKS 2.12A, the student outcome "*...describe how the physical characteristics of environments, including the amount of rainfall, support animals within an ecosystem*" is italicized to indicate the concept will be developed further to gain mastery.
- The End of Module Assessment rubrics define student outcomes to meet grade level expectations. The materials list the TEKS associated with the tasks and learning outcome statements. For example, in Task 2B, the learning statement for mastery states, "The students use details for the information cards to explain (2.3A) how either the roots or the leaves (2.5F) help the plants meet their needs."
- Mastery requirements are included through specific learning targets for each grade level. The materials identify TEKS that are expected to be mastered through the use of bold font and specify in which module this concept will be taught. For example, TEKS 2.12A is identified as a "TEKS for mastery" and will be taught in Module 1, Concept 2.

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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.	M
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

Meets | Score 6/6

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

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. 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.

- Materials support teachers in understanding the vertical alignment guiding the development of grade-level content, recurring themes and concepts, and scientific and engineering practices. For example, the teacher guidance in Module 3 asks the teacher, "Why do students learn about the eardrum?" The materials reference the Texas Essential Knowledge and Skills (TEKS) alignment, from grade 1 to grade 2, stating "In the Level 1 (grade 1) Survival Module, students learned about the structure and function of external body parts and that animals use some body parts to sense information." In grade 2, students revisit a recurring theme to learn how sound can make objects vibrate.
- The materials support teachers in understanding the horizontal and vertical alignment guiding development of grade-level content, recurring themes and concepts, and scientific and engineering practices. For example, materials include a Horizontal and Vertical Alignments guide that outlines when scientific and engineering themes are included in each grade-level module strand and across grade levels.
- Materials support teachers in understanding the horizontal alignment guiding the development of grade-level content, recurring themes and concepts, and scientific and engineering practices. Materials include a TEKS Content Development Progression, which outlines TEKS taught within

each grade level and module. The bold text indicates the standards that are mastered in the module and italicized text indicates standards to be mastered in later lessons. For example, in Module 3, Plants, the TEK 2.13B is italicized to identify the TEK as being developed but not expected to be mastered in this module.

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.

- The 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. The materials include a Common Levels K–5 Misconceptions section that includes common misconceptions students may have in each module and grade level, as well as an appropriately developed understanding of the concept. For example, in Level 2, Module 3, a common misconception is, "...plants have body parts that allow them to drink." The teacher is guided to pause the reading to explain, "...plants do not actually drink. Explain instead that plants absorb water like a paper towel soaks up a spill."
- Materials contain explanations and examples of science concepts to support the teacher's subject knowledge and recognition of barriers to student conceptual development as outlined in the TEKS. The materials include a section titled Additional Reading for Teachers. The section provides articles and other reading options to support teachers' pedagogical and content understanding. For example, in Level 2, Module 1, focused on matter, four additional reading options are presented for teachers:
    - "Avian Architecture: How Birds Design, Engineer, and Build" by Peter Goodfellow
    - "Bird Nests: Amazingly Ingenious and Intricate" by Stan Tekiela
    - "Nests: Fifty Nests and the Birds That Built Them" by Sharon Beals
    - "Teaching Emerging Scientists: Fostering Scientific Inquiry with Diverse Learners in Grades K–2" by Pamela Fraser-Abder.
- Materials contain explanations and examples of science concepts to support the teacher's subject knowledge and recognition of barriers to student conceptual development as outlined in the TEKS. In Module 2, Lesson 1, an explanation about the anchor phenomena is provided in the sidebar Teacher Notes. The science concept is "In this lesson set, students discuss sound primarily as music. After this lesson set, students shift their language to primarily discuss sound rather than music. Lesson 7 introduces students to a scientific definition for the term sound . As necessary before Lesson 7, support students' understanding that sound is something a person hears (2.8B)."

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

- The materials explain the intent and purpose of the instructional design of the program. The Foundations section in the Implementation Guide provides an overview of the instructional elements found in the materials. This section states, "Great Minds believes that every child is capable of greatness. The mission of PhD Science Texas is to help teachers provide their students with a science education that is as limitless as science itself. To achieve this goal, students rigorously engage in learning that builds their coherent understanding of scientific knowledge."

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- The Implementation Guide includes three sections, Introduction, Foundation, and Research in Action, to explain the intent and purpose of the instructional design of the program. The Introduction section provides an overview of the importance of science and how the materials engage students in science and other curriculums. The Foundation section explains how "...students rigorously engage in learning that builds their coherent understanding of scientific knowledge." The Research in Action section is divided into three parts and explains what research says about science, what students need, and how the materials respond to the current research by putting "...research-based best practices into action."
- The materials provide a purpose or rationale for the instructional design of the program. The Implementation Guide includes the section "Content Learning Cycle," which explains the instructional design of the materials and how it relates to the 7E model phases. The purpose of this design is to "...help students understand important differences between academic disciplines as well as patterns they can apply to learning in any context throughout their lives."
- The Implementation Guide explains the instructional design of the program as "Students participate in investigations, discussions, and activities that build enduring scientific understanding and competence." Across modules and levels, students revisit fundamental science concepts, developing a deeper understanding of those concepts and applying them to make sense of new phenomena. For example, in Module 1, Lesson 4, lessons include a Launch, Learn, and Land. The Launch includes the instructional routine "Inside–Outside Circles" to elicit student responses after watching a scientific video. During the Learn, students observe six samples of objects and materials and share their observations using new descriptive vocabulary. In the Land, students "...think of other examples that demonstrate that an object's properties can change without changing the properties of the materials. Invite students to share their thinking."

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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.	M
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

Meets | Score 4/4

The materials meet the criteria for the indicator. Materials provide 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 multiple 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.

- The materials consistently provide learning activities that support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers. The materials describe sensemaking as part of the foundation of PhD Science Texas and identify specific sensemaking behaviors of students in the different components of the curriculum. The Implementation Guide explains, "Students participate in investigations, discussions, and activities that build enduring scientific understanding and competence. Across modules and levels, students revisit fundamental science concepts, developing a deeper understanding of those concepts and applying them to make sense of new phenomena." Students also build coherence with sensemaking because modules weave "…a storyline through which students make sense of compelling phenomena. Each lesson builds on previous lessons, allowing students to reflect on their learning, generate new questions, and investigate related topics."

- The materials consistently provide learning activities that support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers. In Level 2, Module 2, students begin sensemaking through phenomena with the exploration of sound clips, visual cards, and photographs of The Recycled Orchestra of Cateura. After viewing the video, students record their observations in their Science Logbooks and share their thinking through a Mix and Mingle activity. Students continue developing sensemaking using photographs, video clips, quotes, and observations of recycled instruments to develop a classwide anchor model that depicts how objects that are thrown away can be used to make instruments and music.
- The materials consistently provide learning activities that support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers. For example, in Module 3, students listen to the text, *Seeds Move!* and observe photographs of different kinds of fruit to describe how seeds travel. Students work in a group to observe the properties of fruits from the text and record their observations in their Science Logbook. Students engage in meaningful sensemaking as they discuss how fruits help seeds travel to new places.

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

- When studying texts related to scientific concepts, the materials provide multiple opportunities for pre-reading activities and vocabulary development. For example, in Level 2, Module 1, students explore the text, *A Nest is Noisy* by Dianna Hutts Aston and Sylvia Long, to build background knowledge on the types of materials birds might use for nest building. To support vocabulary development and knowledge development, the materials provide teacher notes to clarify potential misunderstandings. For example, one teacher note states, “Important, unfamiliar words in this reading may include peculiar, concoct, saliva, exposed, erect, depression, excessive, crop milk, and digestive tracts. As needed, provide students with synonyms, definitions, or example sentences.” The materials also highlight phrases such as, “flies like a torpedo at a termite nest” to support understanding of the text.
- The materials provide opportunities for students to engage in purposeful and targeted activities with grade-level appropriate scientific texts. Each module has a Knowledge Deck that includes posters of reading passages and pictures to develop an understanding of the concepts. For example, Module 2, Knowledge Deck provides three reading passages: *The Recycled Orchestra of Cateura, The Eardrum,* and *Talking Drum,* that support understanding of the module anchor phenomena. In Module 2, Lesson 18, the teacher reads *Talking Drum* to develop student understanding that drums can be used to communicate sound. Students use sticky notes to write what they learned about how people use drums to communicate.
- The materials provide multiple opportunities for students to engage with scientific texts to gather evidence and develop an understanding of concepts. For example, in Module 3, Lesson 1, the teacher engages in pre-reading strategies before reading the text, *Volcano*. The teacher allows students to preview the covers of the book and invites students to share what they notice and wonder. The teacher shows students a photograph of the 1980 eruption to build background knowledge. The teacher also “instructs students to use a nonverbal signal each time they notice an example of how the eruption changed the area around Mount St. Helens.”

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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.

- The materials provide opportunities for students to display an understanding of scientific concepts in written and graphic modes. For example, in Module 3, Lesson 19, students apply their knowledge of seed travel and the life cycle of new plants. After students observe a huckleberry plant and identify its properties, students draw a model in their Science Logbook of how they think huckleberry plant seeds travel. Students also write about their model below their illustration.
- The materials provide opportunities for students to display an understanding of scientific concepts in graphic modes. For example, in Module 3, Spotlight Lesson 1, students compare temperature and precipitation data of the Cypress Slough and Longleaf Pine Forest. Students use their Science Logbook to draw bar graphs of the temperature and precipitation data of each environment and find similarities and differences in the data.
- In second grade, students have the opportunity to express scientific concepts through writing and graphics. Students participate in Engineering Challenges where they plan and conduct experiments and create data sets to analyze and improve a product. For example, in Module 3, students use the engineering design process to create pollination tools that assist humans in pollinating plants. Students investigate materials and create a design plan using words and pictures to justify the materials they choose. Students build their model, test the transfer of pollen, and record the data in their Science Logbook. Finally, students write two observations and draw conclusions about how to improve their tool.

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.

- The modules are designed to engage students and help them persevere through concepts with productive struggle while acting as scientists and engineers. Each module includes an Engineering Challenge that encourages students to reflect on a problem, design a plan, implement their model, record their data and observations, and reflect to improve their model. For example, in Module 2, Lesson 23, students create a device to help the teacher hear over a long distance. Students work in groups and test their devices to determine if they can communicate over 80 feet. Students use their observations to work with a partner to revisit their plans and make improvements to increase the distance their device can communicate. The teacher provides guiding questions to lead the students in focused conversations. The teacher provides guiding questions to lead the students in focused conversations and students improve their existing devices and test them again.
- The modules are designed to engage students to act as scientists and engineers and help them persevere through concepts with productive struggle. For example, in Module 2, Lesson 22, students improve their models throughout the stages of the engineering design process. As students assemble their model, the teacher visits groups to discuss their choice of materials and predictions with the questions, “What sound will your device make for each message?” “What parts will your device have?” “What sound will each part make?” and “How will message senders use the materials to send each message?”
- The materials create transfer opportunities for students to take what they have learned and use it flexibly in new situations. For example, in Module 3, students read about how seeds travel and

observe various plants to identify their properties and travel patterns. Later in the module students observe a huckleberry plant and identify its properties. Students discuss the questions, “Do you think the huckleberry's properties could help it travel to a new place?” and “Why do you think that?” Students support their claim with evidence from previous observations of various seeds and their travel patterns.

Great Minds PhD Science Texas Grade 2

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.	M
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.	M

Meets | Score 4/4

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

Materials prompt students to use evidence to support their hypotheses and claims. Materials include embedded opportunities to develop and utilize scientific vocabulary in context. Materials integrate argumentation and discourse throughout to support students' development of content knowledge and skills as appropriate for the concept and grade level. 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.

Evidence includes but is not limited to:

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

- The materials prompt students to use evidence when supporting their hypotheses and claims. For example, in Module 1, Lesson 6, students use previous descriptions of solids and liquids to determine whether they think a cotton ball is solid or liquid. The materials prompt the teacher to ask, "What evidence supports your thinking about the cotton ball?" and "How might we learn more about solids and liquids to improve our description of them?"
- The materials specifically prompt students to use evidence when supporting their hypotheses and claims. In Module 1, Lesson 29, Spotlight Lesson on Weather, students build a shelter and come to a consensus on a final design for their group's shelter. The "Differentiation" side note provides sentence stems "I think we should…because…," "What if we try…?" and "I agree/disagree because…." for students who may need support articulating their claim.
- The materials prompt students to use evidence to support their hypotheses and claims. For example, in Module 3, Lesson 22, students analyze photographs of burs and huckleberries, make a claim as to which would stick better to an animal, and explain why. The materials guide the teacher to confirm the claim that a bur will stick better to an animal because of its properties and guide students to identify evidence that could be used to support the claim. Students select

which properties can support their claim and write them in their Science Logbook before sharing them with the class.

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

- The materials present scientific vocabulary using multiple representations. For example, in Module 1, Lesson 18, an English Language Development Teacher Note guides teachers to introduce the term "reversible change." The materials guide the teacher to demonstrate a reversible change using the following strategy; "Show students a sock or another piece of clothing and turn it inside out. Ask students how they could change it back to how it started. Continue demonstrating reversible changes with actions such as blowing up a balloon or folding a piece of paper. Invite students to think of other examples of reversible changes."
- The materials present scientific vocabulary using multiple representations. For example, in Module 2, Lesson 5, students activate prior knowledge and discuss parts of instruments that shake. The teacher links this prior knowledge to introduce the new vocabulary word "vibrate." Students listen to a kalimba to determine how it makes sound and compare it to the vibrations made by a ukulele. In Lesson 6, students apply the vocabulary word in context as they explore instruments to feel vibrations.
- The materials provide opportunities for students to apply scientific vocabulary within context. For example, in Module 3, Lesson 21, students work in groups to develop food chains. Students then participate in a Gallery Walk and answer guiding questions to identify the similarities and differences in all the food chains. The teacher uses the student response that all the food chains start with a plant to introduce the vocabulary term "producer" and "consumer" in student-friendly terms. Students work with their groups to label their food chain pictures as a producer or a consumer.

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

- The materials provide opportunities for students to develop how to engage in the practice of argumentation and discourse. Within the Implementation Guide, the section "Instructional Routines" provides collaborative conversation routines and techniques to support student discourse within the science classroom. For example, in the activity "Mix and Mingle," students receive a topic or question or prepare a question related to a concept. Students then circulate around the room and find a partner to share their responses with. Students circulate around the room again and stand with a different peer to discuss responses to the same question or a new question. The materials guide the teacher to circulate and provide sentence frames or support during the activity.
- The materials provide grade-level appropriate opportunities for students to develop and participate in argumentation and discourse practices. In Module 2, Lesson 3, Spotlight on Objects in the Sky, students engage in the instructional routine "On/Off the Bus." Students stand or sit in a line as if they are on a bus and listen to a statement related to the learning read aloud. If the student agrees with the statement, they move forward, or "off the bus." If the student disagrees with the statement, they do not move from the line, or "stay on the bus." Students then explain their reasoning of why they agree or disagree with the statement.

- The materials provide grade-level appropriate opportunities for students to develop and participate in argumentation and discourse practices. Materials provide students with the opportunity to discuss and deepen their knowledge through Socratic Seminars. For example, in Module 3, Lesson 28, students prepare for the seminar by engaging in a discourse about the essential question with a partner. During the Socratic Seminar, students engage in conversation by responding, asking questions, summarizing, providing evidence, and making connections. While the conversation is supposed to be student-driven, there is teacher guidance to enhance the conversation, using instructional strategies such as "...students use sentence frames to help them build on one another's remarks."

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.

- The materials provide criteria for developmentally appropriate arguments to explain a phenomenon or defend a solution to problems using evidence acquired from learning experiences. The materials include a Teacher Note in the Teacher's Edition to support student reflection on their ability to explain a phenomenon or defend a solution to a problem through a rubric. For example, in Module 1, Lesson 34, the Teacher's Note states, "Display a student-friendly version of the rubric evidence description for the assessment item. Have students share evidence and questions about how the sample response meets rubric expectations. Display a sample response that does not meet expectations alongside the previously displayed sample response that does meet expectations. Have students compare the responses. Have students offer feedback on peers' responses or on their own response to the assessment item."
- The materials provide opportunities for students to justify explanations of phenomena and solutions to problems using written and verbal arguments to problems using evidence acquired from learning experiences. In Module 2, Lesson 14, students use Knowledge Deck cards to review the eardrum's location inside the ear. Students work in pairs to add drawings or labels to the diagram on the back of their card to show what happens to the eardrum when sound is made nearby. Students then "write an explanation in their Science Logbook (Lesson 14 Activity Guide) of what happens when sound reaches the eardrum. Ask students to support their explanation with evidence from the investigation. Encourage students to refer to the eardrum diagram on their Knowledge Deck card as necessary. Then discuss student responses as a class."
- The materials provide instruction for how to construct and present a verbal or written argument to problems using evidence acquired from learning experiences. For example, in Module 3, students complete an "Engineering Challenge" to develop a pollination tool that humans could use to pollinate plants. The student Science Logbook guides students through collecting evidence and using the information to construct arguments. Students draw and label a model of their tool, list materials needed, and explain how the materials will work. Students construct their model and conduct three trials of how far their tool can carry pollen. Students then come together as a class to share if their tool was effective and argue why. Students are allowed to improve their tool after engaging in an "Inside-Outside-Circle" where students discuss and justify reasons why their pollination tool worked well and ways it didn't.

Great Minds PhD Science Texas Grade 2

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 provide teacher guidance to support student reasoning and communication skills.

Materials provide 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 guidance on anticipating student responses and the use of questioning to deepen student thinking. For example, in Module 1, Lesson 12, students investigate objects and materials to determine that volume is a property of matter. Students select two objects in the classroom that they can hold with a single open hand and are challenged to hold two objects in the exact same place on their hands at the same time. One question prompt states, "Can the two objects be in exactly the same place on your hand at the same time? Why or why not?" Possible student responses include, "No. I can put the pencil next to the eraser on my hand, but they aren't in the same place." and "No. The two objects can be next to each other or on top of each other, but they can't be in the exact same place." Students deepen their understanding by reflecting on whether the water inside a cylinder and a glass marble can be in the same place at the same time.
- The materials provide teachers with possible student responses to questions and tasks and provide teacher guidance for the use of questioning to deepen student understanding. Materials use bold print to emphasize a question and use an italicized font to display possible student responses. For example, in Module 3, Lesson 9, students observe photographs of grains and the teacher asks, "Why might pollen's shape be important during interactions between animals and

flowers?" The materials list two possible student answers. The materials then instruct the teacher to confirm student responses, "...pollen's shape is important because it helps pollen attach to the bodies of animals when the animals interact with flowers."

- The materials provide support for teachers to deepen student thinking through questioning. For example, in Module 3, Lesson 1, the teacher asks students, "What do you think the area around the volcano looks like today?" and "What evidence supports your thinking?" Since this is Lesson 1, the materials include some possible student responses in which students admit they don't have any evidence to support their claim. The teacher then asks a question to deepen students' thinking and model how to collect evidence, "How could we find out what the area looks like today?"

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

- The materials guide the teacher on how to support students' use of scientific vocabulary in context. The materials provide an Act It Out routine, in which students connect movement with an unfamiliar term or concept to remember its meaning. For example, in Module 1, Lesson 18, students demonstrate their understanding of the term "reversible change" and act out what a solid and a liquid look like. Students demonstrate their understanding of reversible change as they act out what happens to an ice cube during heating, cooling, melting, and freezing.
- The materials provide embedded support for the teacher to prepare for vocabulary introduced in the module. Materials include a Module Overview which is a preview of the vocabulary in the lessons. For example, in Module 2, Lessons about Sound, the vocabulary words listed are "...device, eardrum, sound, and vibrate." To support the development and use of scientific vocabulary in context, students will "...learn the following terms through investigations, models, explanations, class discussions, and other experiences."
- The materials guide the teacher on how to support students' use of scientific vocabulary in context. For example, in Module 3, Lesson 12, students participate in a Mix and Mingle routine to answer questions and share responses with peers. The section, "Content Area Connection: English" supports vocabulary development and states, "As students participate in the Mix and Mingle routine, they demonstrate the development of their language skills by using words and phrases from the module, such as pollen, pollination, pollinator, and flower, in their responses." The materials also encourage the teacher to scaffold the activity to allow additional vocabulary practice to support students if they do not use these words and phrases within the routine.

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 and supporting students in using evidence to construct written and verbal claims. For example, in Module 2, Lesson 13, the Differentiation side note supports the teacher by providing questions, sentence frames, and suggestions to teach vocabulary. The questions in the materials support students in using evidence to construct a verbal claim, such as, "Do you predict the instruments will sound the same in each area the audience walks through? Why or why not?" Materials guide the teacher to prepare students for discourse by considering "...providing them with a word bank of the volume-related terms they used in their observations and predictions in previous lessons. The word bank might include terms such as loud, quieter, and very quiet."

- The materials provide a section in the Implementation Guide, titled “Supporting Scientific Discourse” that provides teacher support to prepare for student discourse. The materials state, “During every step of their learning, students must have the opportunity to process information. When students clarify, justify, and interpret their ideas through discussion, they deepen their reasoning...Discourse is the sense-making tool students use to put the pieces of evidence together to develop scientific understanding.” The Implementation Guide provides collaborative conversation prompts to support student discourse. These prompts are categorized by clarification, reasoning, evidence, and collaboration. For example, reasoning prompts include “Why do you think that?” “How did you come to that conclusion?” “What do you think caused that?” “If what you said is true, then how do you explain...?” “What is an alternative to...?”
- The materials provide teacher support to prepare for student discourse in the Implementation Guide. The Implementation guide provides suggestions to establish classroom expectations to allow for student discourse and provides four student norms for collaboration. The student norms are, “... 1) Actively and effectively participate in discussions and collaborations, building on the ideas of others and clearly communicating their own ideas. 2) Listen actively to interpret verbal and nonverbal messages, ask relevant questions, and make pertinent comments. 3) Evaluate information from various media presented in different formats. 4) Work collaboratively with others to develop a plan of shared responsibilities and rules for discussion.”

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

- The materials provide teacher support and guidance to engage students’ thinking in various modes of communication throughout the year. For example, in Module 1, Lesson 1, students reflect on the differences between their initial models of bird nests and a picture of a blue jay nest. Students then engage in a Mix and Mingle routine, which allows students to share ideas about a topic or question with peers as they move around the room. Students respond to the questions, “How is the blue jay nest similar to your model?” and “How is the blue jay nest different from your model?” The teacher refines student responses through a class discussion to determine that some of the materials the blue jay uses in its nest may not be represented in students' models.
- The materials provide teacher support and guidance to engage students’ thinking in various modes of communication throughout the year. For example, in Module 1, Lesson 9, students investigate how the strength of a push and pull changes an object's motion. Students record the results of the investigation in their Science Logbook and gather evidence about their claim. Students reflect on the process they followed as they plan and conduct the investigation and share their thinking aloud. In the next lesson, students use their observations as evidence to evaluate the claim that the strength of a push or pull can change an object's motion. Students use a nonverbal signal to indicate whether they think the evidence supports the claim. Finally, students use their Science Logbook to explain if the evidence supports the claim and why. The materials state that “students should use evidence from the investigation in their explanation.”
- The materials provide teacher support and guidance to engage students’ thinking in various modes of communication throughout the year. Materials support the facilitation of student thinking through various instructional routines. For example, in Module 2, Lessons about Sound, students engage in the instructional routine “Jot–Pair–Share” in which students “...quickly jot down their thinking and then discuss it with a partner before sharing it with the class.”

Great Minds PhD Science Texas Grade 2

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

Materials include a range of formative, summative assessments, and diagnostic assessments to assess student learning in a variety of formats. Materials assess all student expectations over the breadth of the course and indicate which student expectations are being assessed in each assessment. 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.

- Materials include a range of formative and summative assessments that include formal and informal opportunities to assess student learning in a variety of formats but do not include diagnostic assessments to measure student learning and identify learning gains. Within the Implementation Guide, the section, “Going Deeper- Assessment,” explains the four types of assessments and how frequently they are present in the materials. Each lesson contains at least one Check For Understanding, and each concept includes a Conceptual Checkpoint. Every module includes an Engineering Challenge and an End-of-Module Assessment. Spotlight Lessons include an End-of-Spotlight Assessment. Materials include Check for Understanding assessments, core tasks, and anchor visual routines that can be used as diagnostic assessments throughout this module
- Materials include formative assessments in a variety of formats to measure student learning and determine the next steps for instruction. The materials provide Checks for Understanding, which “formatively assess students as they develop new knowledge and skills.” For example, in Module 1, Lesson 18, students demonstrate their understanding of reversible change using the instructional routine, “Act It Out.” Students act out what an object they observed did, such as an ice cube during heating. The Check for Understanding suggests that teachers “watch for

students to express that changes in matter result from heating and cooling (2.6B, 3D). If students do not correctly identify that the changes resulted from heating and cooling, ask guiding questions such as these: What did the object look like before it was heated? How did the object change?"

- Materials include summative assessments in a variety of formats. Each module contains a summative End-of-Module assessment that "gives students the opportunity to demonstrate the knowledge and skills they have acquired throughout the module in the context of one or more phenomena." In the End-of Module Assessment for Module 1, Lesson 33, students apply their understanding of how matter can be described, classified, and used. Students view a Knowledge Deck poster, "Little Dancer Aged Fourteen," and answer questions about matter and why materials are used to make certain objects. The materials provide a rubric that describes evidence of student work that meets expectations. Blank spaces are provided for teachers to record evidence of student work that exceeds or falls below expectations. Additionally, an alignment map is provided that details the content standards, scientific and engineering practices, and recurring themes and concepts aligned to each question on the assessment.

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

- The materials assess all student expectations, as outlined in the TEKS, by grade level. The Implementation Guide contains a section titled "TEKS Content Development Progression," which outlines the standards addressed and assessed within each Module and Spotlight Lesson. In addition to outlining the standards addressed, the materials use bold text to identify components of standards that students should master within the lessons. The italicized text identifies standards that students will develop knowledge, but will master in later lessons. The materials also include horizontal and vertical alignment documents that outline each content standard and the Module or Spotlight Lessons they are addressed and assessed.
- The materials indicate which student expectations are assessed. Each module contains an End-of-Module Assessment that is a summative assessment of standards taught within the module. The materials include an End-of-Module Assessment that includes the TEKS assessed by each item, as well as evidence of student work that meets expectations for each standard. For example, in the Module 1, End-of-Module Assessment, items 1a and 1b assess the TEKS 2.5E, 2.6A, 2.1E, and 2.11A. The rubric identifies criteria for evidence of student work that meets expectations and states, "The student observes the materials to identify their properties (2.5E) and matches each material to the correct set of properties (2.6A). The student observes the materials (2.1E) to identify if they are human-made or natural resources (2.11A)."
- The materials assess all student expectations, as outlined in the TEKS, by grade level. Each lesson includes a Check for Understanding section that includes the TEKS being informally assessed. For example, in Module 3, Lesson 6, one of the Check for Understanding tasks states, "Students describe how they will use the data they collect as evidence of what plants need (2.13A) and of how different conditions (2.5G) of water and light (2.12A) affect plant growth (2.5B)."

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

- The materials include teacher guidance on how the components of the modules work together to allow students to apply understanding on assessments. In the Implementation Guide, PhD Science Texas explains that the curriculum "…offers several types of assessments in each

module. Science Challenges and Engineering Challenges allow students to apply their knowledge in both familiar and unfamiliar contexts." End-of-module lessons have three components that integrate the recurring concept from the module: "First, students participate in a Socratic Seminar to discuss and synthesize module learning; next, a summative individual assessment gives students an opportunity to demonstrate mastery of knowledge and skills they acquired throughout the module; and, finally, students evaluate their own knowledge."

- The materials contain assessments that test students' ability to apply scientific knowledge and practices to recurring themes relevant to their learning goals. Each module includes an Engineering Challenge that evaluates students' proficiency in science and engineering practices. The materials include a standards-addressed table that outlines content standards, scientific and engineering practices, and recurring themes and concepts that are included within the Engineering Challenge lessons. For instance, in Module 1, students follow the engineering design process to design and build a shelter that provides protection from rain. Throughout the challenge, students analyze the properties of various materials to determine which materials are most suited to building a shelter. Students also apply their understanding that a structure's shape and stability relate to its function as they imagine, create, test, improve and share their solutions.
- The materials include assessments that require students to integrate scientific knowledge and science and engineering practices with recurrent themes appropriate to the student expectation being assessed. For example, in Module 3, Spotlight Lessons on Living Things, students investigate how different environments in the Big Thicket National Preserve can have different land and water features, how animals survive in their environments, and the changes animals undergo during their life cycles. Students then apply this knowledge to a new phenomenon during the End-of-Spotlight Assessment to explain how living things meet their needs in different parts of the Great Smoky Mountains National Park.

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

- Materials include assessments that require students to apply knowledge and skills to a new phenomenon or problem. Within each Spotlight Lesson concept, students engage in an End-of-Spotlight Assessment that requires students to apply knowledge and skills to a new problem. For example, in Module 1, Spotlight Lessons on Weather Events, students explore the 1900 Galveston hurricane to investigate how severe weather can affect a city. During the End-of-Spotlight Assessment, students apply their knowledge to a new phenomenon, flash floods, and explain how severe weather can cause flash floods.
- Materials include assessments that require students to apply knowledge and skills to a new phenomenon or problem. For example, during the Conceptual Checkpoint in Module 2, Lesson 10, students apply their previous learning about vibration and instruments to answer questions about how a music box makes a sound.
- Materials include assessments that require students to apply knowledge and skills to a new phenomenon or problem. For example, in Module 3, students investigate how plants recovered after the Mount St. Helens eruption. Students explore how plants need different amounts of natural resources, pollination, and how seeds travel. Students then apply their knowledge of plants within the End-of-Module Assessment by explaining how the Geyer Willow in Yellowstone National Park meets its needs.

Great Minds PhD Science Texas Grade 2

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 student's needs, in all areas of science, based on measures of student progress appropriate for the developmental level.	M
3	Materials 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.	M

Meets | Score 2/2

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

Materials include information and/or resources that provide guidance for evaluating student responses. 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. Assessment tools yield relevant information for teachers to use when planning instruction, intervention, and extension. Materials provide a variety of 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 provide guidance for evaluating student responses.

- Materials include resources that guide teachers in evaluating student responses. The modules contain rubrics for Engineering Challenges and End-of-Module Assessments which provide evidence of student engagement and whether student responses meet expectations. Additionally, the rubrics have blank spaces for teachers to note when student work goes beyond or falls short of expectations. For example, in Module 1, the Engineering Challenge Rubric outlines expectations for each stage of the Engineering Design Process, which includes "ask, imagine, plan, create, improve, share, and overall." An example of a student response that meets expectations in the "imagine" stage is, "The student evaluates data (2.2D) about changes that occur to materials during testing (2.6B), and uses the materials' properties including shape, size (2.6A), and structure (2.5F), to determine whether the materials are suitable for use in their shelter (2.6C)."
- Materials include information that guides teachers in evaluating student responses. In the Module 3 End-of-Module Assessments, students answer five multiple-choice questions and two written response questions. An answer key is provided which includes sample student responses for the written response questions. The inline Teacher Note in Module 3, Lesson 29, instructs the teacher to score the assessment using the provided rubric. The rubric provides the TEKS for each item number and an explanation for rating student responses using a 1-4 rating scale. The

materials also include an End-of-Module Assessment Alignment Map for teacher reference. This map provides item numbers and a correlation to content standards, scientific and engineering practices, and recurring themes and concepts.

- Materials include information that guides teachers in evaluating student responses. Materials include samples of acceptable student answers to guide teachers in evaluating student responses. For example, in Module 3, Lesson 29, the Inline Teacher Note guides the teacher to, “identify at least one assessment item to debrief with the class in the next lesson. Also select an exemplar student response for the item to show students, or display the sample student response to this item from the Teacher Edition.” The lesson also provides teacher instructions for facilitating the use of the selected exemplar or sample question. Materials guide the teacher to allow students to evaluate their own responses compared to peer responses and make revisions to their assessments.

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 provide guidance and resources to support teachers' overall analysis of assessment data and respond to individual student needs. The materials provide guidance documents and resources to support teachers' analysis and interpretation of the assessment data. For example, within the Implementation Guide scoring guidance for assessments, individual student score sheets, class trackers for item performance, standard performance, and next steps are provided to support teachers.
- Materials include assessment tools that yield data teachers can easily analyze and interpret. The materials include rubrics for End-of-Module Assessments, End-of-Spotlight Assessments and Science/Engineering Challenges, that include the standards being assessed for each item and a description of the four scoring indicators. The implementation guide also provides teachers guidance on how to score and analyze results. For example, the materials include a chart of the different assessment types of questions and the suggested point value to assign. A Proficiency Band Information section is provided that explains the levels and percentage cutoffs to determine students who meet, approach, or do not meet expectations. Questions to consider when analyzing student and class trackers are provided in the Implementation Guide. Some reflection questions include, “Which content do I need to reteach with this student?” and “On which items did students struggle?”
- Materials provide guidance and resources to support teachers' analysis of assessment data. For example, in Module 3, a Teacher Note instructs teachers to analyze students' responses from the End of Module Assessment and select questions to review in the following lesson. The materials include an answer key with example written response answers to help the teacher when analyzing student data. Additionally, the materials provide suggestions for examining patterns or trends in the assessment data to help the teacher better understand and respond to student individual needs.

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

- The materials tools yield relevant information for teachers to use when planning instruction, intervention, and extension. For example, in Module 1, Lesson 22, students engage in a

Conceptual Checkpoint in which they investigate and explain the changes beeswax undergoes during heating and cooling. An inline data chart provides evidence for students who show mastery of the skill or concept and states, “Students use the model (2.1G) and describe that heating causes (2.5B) beeswax to melt (2.6B) and change (2.5G) from solid to liquid (2.6A).” The materials provide teacher information for planning intervention for students who do not master this concept and state, “If students do not explain that heating caused the beeswax to melt, provide the following prompt to guide their thinking: The beeswax was solid when it was cool. What happened next to change it into liquid?” After debriefing the Conceptual Checkpoint as a class to clear up misunderstandings, the materials provide a sidebar extension note that states, “If time allows, consider revisiting the Launch discussion about honey bees keeping their nests 'safe, strong, and dry in sunshine, rain, or snow.' Ask students to share how they think rain might affect honey bee nests. then remove several beeswax pellets from a jar and place them on a nonabsorbent surface...Pour a small amount of water over the beeswax pellets, and invite students to share their observations of what happens next (3D).”

- The information gathered from the assessment tools helps teachers when planning differentiated instruction for students who do not yet understand a concept. For example, each Conceptual Checkpoint includes a section titled “Next Step.” The Next Step in Module 3, Lesson 7 states, “If students need support to explain how the saguaro’s parts support the plant’s survival, ask questions such as these: What does the saguaro need to survive and grow? How does the saguaro use its parts to get water?”
- The information gathered from the assessment tools helps teachers when planning extensions. For example, in Module 1, Lesson 22, students complete a Conceptual Checkpoint about how matter can change. At the end of the debrief, there is a sidebar note under “Extension” to guide the teacher in planning that states, “If time allows, consider revisiting the Launch discussion about honey bees keeping their nests ‘safe, strong, and dry in sunshine, rain, or snow.’ Ask students to share how they think rain might affect honey bee nests. Then remove several beeswax pellets from a jar and place them on a nonabsorbent surface such as a plastic or ceramic plate. Pour a small amount of water over the beeswax pellets, and invite students to share their observations of what happens next.”

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 student resources for teachers to use in responding to performance data. End-of-Spotlight Assessment Next Steps are provided for students who have not yet met expectations. For example, in Module 1, if students are not successful with item 2a, the materials provide next steps that state, “support students with recording and describing observable weather conditions using pictures and symbols by reviewing Lessons 2 and 3 with students.” Materials also provide sidebar and inline supports for in-the-moment resources, such as differentiation notes, teacher notes, and check-for-understanding opportunities.
- Materials provide a variety of teacher guidance for responding to student data. For example, the materials include next steps to take after the End-of-Spotlight Assessment. The next steps are organized in a chart by corresponding item number. The TEKS are also listed for teacher reference. An example of a next step for the End-of-Module 1 Spotlight Assessment, is, “Support students with using patterns to record and organize temperature data in a table and bar graph by reviewing Lesson 6 with students.” This addresses item number 2D and TEKS 2.1F and 2.10B. Materials provide student resources for extension activities that “...may be used as whole class activities or may be assigned to students who would benefit from an additional challenge.”

Following the End-of-Module Assessment, the materials also suggest, “Offer students who need remediation the opportunity to revisit portions of the module.” Materials provide some teacher guidance on how to leverage different activities to respond to performance data. Throughout the module, there is in-the-moment guidance through Check for Understanding sidebars to address student performance data through informal assessments. However, the materials do not include additional activities for students to review and practice content beyond what is found in the lesson. Suggestions include guided questions or a review of previous learning and materials. For example, in Module 2, Lesson 1, the Check for Understanding sidebar states, “Students use their observations of the sound each object makes to sort their cards into categories (2.8B). To support students who have miscategorized cards, replay the necessary sound clips. After each sound, ask the following question: ‘Is this sound music?’”

Great Minds PhD Science Texas Grade 2

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.	M
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.	M

Meets | Score 2/2

The materials meet the criteria for this indicator. Assessments are clear and easy to understand.

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

Evidence includes but is not limited to:

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

- Assessments contain items for the grade level that are scientifically accurate. Formative and summative assessments include assessment items that align with grade-level standards and concepts, science and engineering practices, and recurring themes in a scientifically accurate way. For example, in Module 1, Lesson 15, students complete a Conceptual Checkpoint assessment in which they observe materials from bee nests and record observations related to the properties of the materials. In a sidebar Teacher Note, the materials state. “Students may be familiar with the idea that honey bees live in beehives. If necessary, explain to students that beehives are structures people build to keep honey bees and collect the honey the bees produce. In the wild, honey bees build their nests in natural places such as openings in rock faces or hollow trees.” Ensuring that students understand this keeps the assessment scientifically accurate and allows students to investigate the properties of natural honey bee nests.
- Assessments contain items for the grade level or course that avoid bias. Formative and summative assessments include items and concepts that present content and examples in a fair and impartial manner, with no impact on student performance based on such factors as a student’s home language, place of origin, gender, or race and ethnicity. For example, in the End-of-Module Assessment for Module 1, students apply their understanding of properties of matter and how that affects what materials are used to create certain things to a new phenomenon, the “Little Dancer Aged Fourteen” sculpture. The assessment provides background information for the historical and cultural aspects of the sculpture to provide an unbiased environment where students can apply their understanding of matter to answer the assessment items.

- Assessments contain items for the grade level that are scientifically accurate. Formative and summative assessments include assessment items that align with taught objectives and present grade-level content and concepts, science and engineering practices, and recurring themes and concepts in a scientifically accurate way. For example, in the Conceptual Checkpoint in Module 2, Lesson 10, students use previous learning on vibrations with musical instruments to determine how a music box makes sound and why another music box is broken and will not make a sound. Students answer questions to demonstrate an understanding of all components of TEKS 2.8A, "sound is made by vibrating matter and that vibrations can be caused by a variety of means."

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

- Within the materials, assessments contain clear pictures and graphics that are developmentally appropriate. For example, in Module 1, students engage in various formative assessments as they analyze the properties and materials of various bird nests. The materials provide photographs of each type of nest including Baya Weaver nests, Swiftlet nests, American Flamingo nests, and Cactus Wren nests. The images are clear and developmentally appropriate for second graders to analyze and look for properties of matter.
- Assessment tools use clear pictures and graphics that are developmentally appropriate. For example, the Conceptual Checkpoint in Module 2, Lesson 17, uses a graphic to represent a plane flying over buildings. The graphic includes clear and appropriate arrows, question marks, and vibration symbols that students can use to identify the appropriate parts of the graphic to answer the question.
- The End-of-Module Assessments use clear pictures and graphics that are developmentally appropriate. For example, Module 3, End-of-Spotlight Assessment, includes thirteen different, clear, and in-color images. These images include photographs of butterflies, a caterpillar, eggs, a chrysalis, a tadpole, a froglet, an adult frog, a larva, and salamanders. Several of these images are a part of two life cycle models and have clear labels that are easy to read.

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

- Materials provide clear guidance for teachers to consistently and accurately administer assessment tools. During an End-of-Module or End-of-Spotlight assessment, the teacher finds guidance for consistent administration of the assessment in the section titled "Learn." The materials instruct the teacher to read one question at a time and allow enough time for each student to respond before moving on to the next assessment item. The materials provide step-by-step directions for the teacher on what to explain and instruct students to observe or resources to use while giving the assessment.
- The materials provide clear guidance for teachers to consistently and accurately administer assessment tools. For example, in Module 1, Lesson 22, the "Learn" section of the lesson supports teachers in preparing for and administering a Conceptual Checkpoint. The materials direct the teacher to play a video of beeswax melting as students focus on the kinds of matter they observe. After the video, students also observe beeswax pellets in a jar. The materials next direct the teacher to "tell students to look at the beeswax changes model in the Conceptual Checkpoint (Lesson 22 Resource). Remind students that they observed the heating of solid beeswax in the video, and then they examined a jar of cooled beeswax. Point out the two boxes labeled Solid and Liquid in the model, and explain that each arrow shows a process that the class has observed and discussed during the last few lessons. Tell students that arrow A shows the

process that happens when the beeswax changes from solid to liquid and that arrow B shows the process that happens when the beeswax changes from liquid to solid. Ask students to identify each process and write its name on the correct line."

- The materials include detailed information that supports the teacher's understanding of assessment tools and their scoring procedures. After each End-of-Module assessment, the materials provide an example of sample student responses and a rubric of student expectations for standards and assessment items. The sample student response example contains the correct answers and what a student must do to score within the "meets expectations" column. The materials also provide teachers guidance to debrief the End-of-Module Assessment with students, including displaying a student sample for an assessment item and utilizing routines such as inside-outside circles for students to discuss questions such as, "What do you notice about this response? What do you wonder about this response? How does this response change your thinking?"

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

- Materials offer accommodations for assessment tools so that students of all abilities can demonstrate mastery of learning goals. Within the Implementation Guide, under the section, "Going Deeper- Assessments," the materials provide guidance for administering assessments and how to support student needs with accommodations. The materials state, "Students engage with assessment tasks in a variety of ways, and teachers may modify assessment items as needed while preserving scientific rigor. Some students may need additional processing time and supports as they complete assessments. To evaluate students' scientific understanding, teachers may need to read items to some students or allow students to answer orally with a scribe. Students may complete assessments individually or in groups; however, when using formative assessments summatively, teachers should evaluate individual student contributions rather than group performance."
- Materials offer accommodations for assessment tools so that students of all abilities can demonstrate mastery of learning goals. In Module 1, End-of-Spotlight Assessment, students use a blank precipitation graph and have students draw and color a bar each time they observe a weather condition. Materials offer the following accommodation to demonstrate mastery of knowledge: "If students need additional support to create bar graphs, consider providing rulers or manipulatives such as stickers or small squares of paper to paste on the graph."
- Materials offer accommodations for assessment tools so that students of all abilities can demonstrate mastery of learning goals. In the End-of-Module Assessment for Module 2, students "use observations to predict whether people can use a cup telephone to communicate." The materials provide a Differentiation Note and provide the following consideration for students who are deaf and hard of hearing: "Consider supporting students who are deaf or hard of hearing with the last row of data collection by providing a decibel meter or decibel meter app."

Great Minds PhD Science Texas Grade 2

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 still need to achieve 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.

- The materials include teacher guidance for scaffolding instruction and differentiating activities for students who still need to achieve mastery. Each module includes multiple conceptual checkpoint opportunities. These checkpoints have the assessed TEKS, the focus question, evidence for student understanding, and the next steps for supporting students who are not at mastery. For example, in Module 1, Lesson 22, students engage with a conceptual checkpoint that assesses student understanding of the focus question, "How can matter change?" Students observe a beeswax changes model to reflect on changes to the state of beeswax and answer questions. Students respond to the question, "What causes beeswax to change from solid to liquid?" The materials in the teacher support component provide the next steps for students who have yet to show mastery. The materials state, "If students do not correctly identify the process of melting, prompt students with a question such as the following: How did the beeswax change after it was heated?"
- The materials include teacher guidance for scaffolding instruction and differentiating activities for students who still need to achieve mastery. For example, Module 1, Spotlight Lesson on Weather Events, Lesson 5, states, "If students need additional support to read the thermometer, help them visualize the tick marks as a vertical number line. Students should examine the tick marks and determine that each tick mark represents a number. Consider drawing a large thermometer on chart paper. Demonstrate that counting the tick marks by ones is not possible. Then model how to count the tick marks by twos, encouraging students to follow along and count aloud."
- Materials provide additional resources for targeted instruction and differentiation to support students who still need to achieve mastery. The materials offer embedded support throughout

the lessons to identify students who need help and how to aid students in understanding the concept. For example, in Module 3, Lesson 8, there is a Check for Understanding section in which students explain why one group's blueberry plant produced more blueberries. For students unable to explain this concept, the materials suggest the teacher show students blueberry plant photographs and prompt students with the questions, "Which bar on the graph represents the covered plants? What might the open plants get that the covered plants would not?"

Materials provide enrichment activities for all levels of learners.

- The materials provide enrichment activities for all levels of learners that account for learner variability. Each module offers a component titled "Extension Activities" with information and instructions for extension activities, including preparation notes and activities for all levels of learners. For example, in Module 1, Lesson 5, Spotlight Lesson on Weather Events, students can extend their knowledge of temperature by measuring "...the temperature of water and observe a range of temperatures (e.g., ice water, warm water). Make sure students measure the temperature of the water in all cups."
- The materials provide enrichment activities that account for learner variability. For example, materials include Extension sidebars that offer opportunities for all students to extend their learning. In Module 2, Lesson 9, the Extension sidebar guides the teacher to "Create a set of mystery recycled shakers by filling each of several identical opaque containers with inside pieces of a different kind. Ensure that each shaker makes a distinct sound. Assign a group to each mystery shaker. Have groups build a recycled shaker that replicates their mystery shaker's sound. Then use students' work to discuss why different mystery shakers sound different."
- The materials provide enrichment activities that account for learner variability. For example, in Module 3, Lesson 17, students brainstorm how to improve their pollination tool. The Extension sidebar suggests extending the pollinator's student design, stating, "Students can test how successful their pollination tool is when the tool is preloaded with baking soda. Once students complete this investigation with a preloaded pollination tool, they can compare their results to their original testing procedure to see which one transferred more pollen."

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

- The lessons include recommendations for just-in-time scaffolds to develop productive perseverance of learning in the moment. For example, materials include a Differentiation sidebar that provides scaffolded supports that can be implemented during the lesson if needed. In Module 2, Lesson 3, the Differentiation sidebar guides the teacher to, "consider providing additional scaffolds for students who need support to show their learning through open-ended tasks. Divide the task into steps such as these (2E): ▪ Look at the printed pictures, and consider what you know about them. ▪ Use the pictures to tell a partner how the Recycled Orchestra makes music. ▪ Place pictures that go together near one another on your Science Logbook page. ▪ Glue the pictures onto the page, and label them. ▪ Explain your model to a partner."
- The lessons include recommendations for just-in-time scaffolds to develop productive perseverance of learning in the moment. In Module 2, Lesson 19, students work in groups and record data in various stations. The materials guide just-in-time learning acceleration through student partnering suggestions stating, "Some students may need support to follow the procedure correctly and efficiently. Consider partnering with these students at one of the

stations to guide them through each step of the procedure. Then encourage students to repeat the same steps at each station."

- The lessons include recommendations for just-in-time scaffolds to develop productive perseverance of learning in the moment. The materials provide a Conceptual Checkpoint at the end of each concept. In Module 3, Lesson 7, the Conceptual Checkpoint assesses student understanding of how different amounts of resources affect plant growth. The provided chart describes what the teacher should see if students have mastered the concept and the next steps the teacher should take if students have not mastered the concept. For example, if students cannot explain how plant parts help the saguaro survive in the desert, the materials suggest guiding students with the questions, "What does the saguaro need to survive and grow?" and "How does the saguaro use its parts to get water?"
- Lessons provide support and resources for students ready to accelerate their learning. For example, the materials include Optional Homework enrichment activities that contain challenging activities and assignments that extend beyond the regular curriculum and stimulate critical thinking, problem-solving, and creativity. In Module 2, Lesson 7, students can extend their learning by choosing an everyday object at home that makes a sound. Students bring that object to school and demonstrate and explain that sound to classmates.

Great Minds PhD Science Texas Grade 2

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.	M
4	Materials represent a diversity of communities in the images and information about people and places.	M

Meets | Score 2/2

The materials meet the criteria for this indicator. Materials 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 consistently support multiple types of practices (e.g., modeled, guided, collaborative, independent) and provide 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.

- The materials engage students in the mastery of the content through a variety of developmentally appropriate instructional approaches. Within the implementation guide, the materials explain the role of various instructional routines and give specific protocols for implementation. There are ten collaborative conversation routines and techniques, seven written response routines, nine terminology learning routines, and four text-based routines. An example of a written response routine is "Chalk Talk." The materials state, "Chalk Talk is a silent conversation that helps students organize their thinking and fosters universal participation." In this routine, questions are written on the board or on chart paper, and students walk around the room and respond to the questions or each others' comments directly on the board or chart paper.
- Materials engage students in the mastery of the content through a variety of developmentally appropriate instructional approaches such as multimodal texts (i.e., the combination of one or more modes of communication such as speaking, listening, gestures, music, digital, etc.). The Teacher Note in Module 1, Lesson 8, provides students a kinesthetic outlet to connect movement with an unfamiliar idea through the instructional routine, "Act It Out." The routine

guides the teacher to "provide students with the action you would like them to perform. Provide a minute or two for students to imagine how the action might add movement. Then have students take turns acting out the action with a partner or small group."

- The program supports student discourse with authentic opportunities to engage in structured conversations with multiple partners and the whole group to support mastery of a concept. For example, in Module 3, Spotlight Lessons on Living Things and Their Environments, students participate in a Link-Up activity to learn about how animals meet their needs. Each student is given a term card and "students circulate and discuss with each person they meet whether their terms are related." When the terms are related the students link up with each other. After all pairs have been found, each pair shares the relationship with the whole group. Some examples of terms included are, "behavior, sense, life cycle, offspring, environment, and forest."

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

- The materials provide guidance to teachers on when to use specific grouping structures based on student needs. For example in the Implementation Guide, PhD Science suggests, "Grouping students strategically promotes multiple means of student engagement, action, and expression. There are many ways to group students, and every teacher knows what works best for their class and students. When grouping students, consider the task they are to complete." Guidance continues to clarify that, "Grouping students with diverse abilities works well when students perform an open-ended task and each student has a specific role in the task (e.g., reading, recording data, note-taking). This student grouping method allows all students to participate and collaborate to complete a task, brings together students with complementary skills, and encourages a positive classroom culture." The materials also give examples of grouping students with similar abilities or interests that work well within the instructional setting.
- The materials support a variety of instructional groupings (e.g., whole group, small group, partners, one-on-one). In Module 2, Lesson 13, the students engage in a collaborative classroom routine titled "Jot–Pair–Share." Students jot down their thinking and discuss it with a partner before sharing it with the whole class.
- The materials provide guidance for teachers on when to use specific grouping structures based on the needs of students. The materials provide guidance on when to use homogeneous and heterogeneous grouping based on the activity. For example, in Module 1, Lesson 13, the Differentiation sidebar note suggests the teacher group students by ability because "homogeneous grouping gives students an opportunity to develop social and leadership skills in addition to conceptual understanding." In Module 1, Spotlight Lessons on Weather Events, Lesson 12, the note under the "Differentiation" section suggests, "...grouping students with varying capabilities to support student learning."

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

- The materials provide teacher guidance and structures for the effective implementation of multiple types of practices. Within the Implementation Guide, the materials provide an overview of various instructional routines within the categories of collaborative conversation routines and techniques, written response routines, terminology learning routines, and text-based routines. The materials explain the purpose, grouping, and how each routine works. Additionally, within the Teacher's Edition, the materials provide additional teacher guidance for the instructional routines as they appear within lessons. For example, in Module 1, Lesson 4, the

Teacher Note states, "Inside-Outside Circles is a collaborative conversation routine in which the class is divided in half. One half becomes the inside circle, and the other half becomes the outside circle to form two concentric circles. Students in the inside circle pair up with students they face in the outside circle. Students in each pair take turns answering a question or discussing a topic. When student partners finish sharing, one circle rotates so students face new partners for a new question or topic."

- Materials state a clear purpose and learning goals for group practice activities contained in units and lessons. Lessons include opportunities for students to engage in collaborative learning structures, such as Think-Pair-Share, while learning a new concept. In Module 1, Lesson 13, the materials suggest that the teacher display photographs of two different baya weaver nests. The students will use the instructional routine, Think–Pair–Share, to work in a collaborative group and answer the questions, "How are the nests in the pictures similar?" and "How are the nests different?"
- The materials provide multiple opportunities for students to engage in varied types of practices within and across lessons. For example, in Module 1, Lesson 15, students observe and classify the materials in honey bee nests. The teacher facilitates a guided conversation as students revisit the text, "A Nest is Noisy," and discuss matter and birds' nests. Students then engage in a conceptual checkpoint where they independently observe the properties of prepared jars of materials and record two or more observations in their Science Logbooks. At the end of the lesson, the class comes together and engages in a collaborative conversation about their observations of the properties of honey bee nests.

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

- Materials represent diverse communities using images and information that are respectful and inclusive. The materials provide information on cultures and history through lessons and images. For example, in Module 1, Lesson 33, students learn about an artist named Edgar Degas and a sculpture he made, called "Little Dancer Aged Fourteen." Through a read-aloud and Knowledge Deck poster, students learn that Edgar Degas was a French artist who was famous for his colorful paintings. Students also learn that "at the time, many artists made sculptures from bronze, a metal, or marble, a kind of stone. Degas did something new. He used many different materials to create Little Dancer."
- Materials represent diverse communities using images and information that are respectful and inclusive. The Knowledge Deck Posters include photographs from a diverse group of people. In Module 2, Knowledge Deck Posters, the photograph features an orchestra from the country of Paraguay. There is also a photograph of a Black man from Senegal playing the drum. The Module 3 Knowledge Deck Posters, include photographs of animals and plants from diverse communities including Mount St. Helens and the Sonoran Desert.
- Materials represent diverse communities using images and information that are respectful and inclusive. For example, in Module 3, Spotlight Lessons on Living Things and Their Environments, students learn to compare different types of environments using the Big Thicket National Preserve. Students observe photographs and videos of a variety of diverse species. Students are able to see where the Big Thicket National Preserve is located in Texas on a map. At the end of the spotlight lessons, students are able to apply their knowledge to answer questions about the Great Smoky Mountain National Park.

Great Minds PhD Science Texas Grade 2

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

Meets| Score 2/2

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

Materials include guidance for linguistic accommodations (communicated, sequenced, and scaffolded) commensurate with various levels of English language proficiency as defined by the ELPS. Materials encourage strategic use of students' first language as a means to 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 include teacher guidance for linguistic accommodations, with the goal of creating comprehensible input. For example, in Module 1, Lesson 3, the materials guide the teacher to explicitly introduce the term *weight* using the following process: "Pronounce the word weight and have students repeat it. Consider having students hold two objects that weigh different amounts, such as an eraser and a book. After introducing weight and other important terms, provide scaffolds for English learners as they use the words in speaking, writing, and investigating." The materials guide linguistic accommodations for emergent bilingual students, but the accommodations must be commensurate with various levels of English language proficiency. For example, in Module 1, Lesson 5, the English Language Development note states, "Introduce the term classify explicitly...Students may benefit from hearing synonyms such as sort, group, and organize. To support students as they classify samples in the lesson, consider providing sentence frames such as these: These samples are similar because they all…. We can classify these samples by…. We classified these samples as…because they all…." Additional sentence stems are also provided to differentiate the various levels of English language proficiency.
- Materials include linguistic accommodations; commensurate with various levels of English language proficiency as defined by the ELPS. In the Implementation Guide, the materials guide supporting English learners when using new words while writing and speaking. The Implementation Guide suggests using sentence frames and word banks and customizing the support based on each student's need. For example, sentence stems related to

Observe/Describe are provided in order of difficulty, and include, "I see…," "I notice…," "This model shows…," "I observed…when…," and "My observation is that…because…."

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

- The materials encourage the strategic use of students' first language as a means to linguistic, affective, cognitive, and academic development in English, but the materials only support the Spanish language. For example, the Language Development side note in Module 2, Lesson 18 states, "Students will encounter the term message throughout the module. Providing the Spanish cognate mensaje may be helpful. Consider asking students to share different messages they have received, such as text messages or letters in the mail." The materials use Spanish cognates to support Emergent Bilingual students.
- The materials include links for professional development to encourage students' first language as a means to linguistic, affective, cognitive, and academic development in English; however, Spanish is the only first language that is supported. The Implementation Guide provides a link to support English Learners in the section, STEM Subjects: Transforming Classrooms, Schools, and Lives. The synopsis of the free resource notes the value of the Spanish home language in science instruction. The Implementation Guide also provides information on Spanish translation, closed captioning on videos, and translations on web pages to support Spanish-speaking students only.
- The materials encourage the strategic use of students' first language as a means to support students' linguistic, affective, cognitive, and academic development in English. Within the Implementation Guide, the Spanish Translation Considerations section explains that all core texts used within the materials have a Spanish translation. The materials state, "Great Minds provides literature in Spanish so Spanish-speaking students or students learning in Spanish can have the same learning opportunities as students using the English language curriculum. The Ph.D. Science Texas curriculum includes translations of all core texts."

Great Minds PhD Science Texas Grade 2

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 design of the program. 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 information to share with students and caregivers about the design of the program. The materials offer a Family Tip Sheet that provides an overview of what students will learn. The Family Tip Sheet provides caregivers with information about how students will engage in science through sections titled, "What will my student do in class?" and "What will a lesson look like?" The Family Tip Sheet explains that students will engage with an anchoring phenomenon, generate questions on a driving question board, participate in the engineering design process to apply what they have learned to solve real-world problems, and participate in a Socratic Seminar focusing on the importance of questioning. The materials state, "...you will find students in small groups discussing ideas, doing experiments, or reporting their findings...Students uncover key concepts by actively engaging in science and engineering practices. They read high-quality, age-appropriate books that spark curiosity, introduce phenomena, and support the development of scientific understanding."
- Materials provide information to share with students and caregivers about the design of the program. Family Tip Sheets introduce what Ph.D. Science Texas is and what students will do in class. For example, the Family Tip Sheet Overview states that students will not be memorizing facts or simply reading from textbooks but will participate in hands-on investigations, generate questions about phenomena, and participate in discussion and debate.
- Materials provide information to share with students and caregivers about the design of the program. The materials offer a Family Tip Sheet with information about what the students will learn in the classroom within the module. For example, the Family Tip Sheet Overview states,

"...students explore compelling phenomena through observation, questioning, modeling, and investigation." The Family Tip Sheet for Module 1 states, "Your student is studying the materials birds use to build nests and how the properties of matter make materials suited to specific purposes."

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

- The materials provide resources and strategies for caregivers to help reinforce student learning and development. The Family Tip Sheet provides a section titled, "How can I help?" The materials state, "With each module you will receive a Family Tip Sheet that outlines the module concepts and includes ideas on how you can support your student at home. The goal of these suggestions is to help students see science everywhere and not just at school." Materials encourage families to reinforce learning at home by "...talking about science, watching science videos, or visiting a museum, park, or zoo."
- Materials provide information to be shared with caregivers for how they can help reinforce student learning and development. The Family Tip Sheet includes conversation starters and activities for families to use at home. For example, in Level 2, Module 1, some conversation starters include, "Describe an object by its properties (e.g., texture, flexibility), and have your student guess the object. Point out how objects such as building blocks can be combined, assembled, recombined, and reassembled. Discuss how the motion of objects can change because of the strength of a push (e.g., pushing a swing or rolling a toy car). Talk about how you prepare for severe weather." Activities to support student learning about the science concepts include, "Invite your student to cook or bake with you and talk about the properties of different ingredients. Visit a park or zoo to observe animal homes. Ask your student to describe how the materials used are suitable for the animal home. Safely explore melting and freezing at home with different liquids such as water and juice."
- Materials provide at-home activities for caregivers to help reinforce student learning and development. Materials include optional homework assignments that allow caregivers to extend learning beyond school and into the home. For example, the optional homework assignment in Module 2, Lesson 4, about Sound, is for students to "…work with someone at home to take turns using their hands to demonstrate how several different instruments are played. While one person demonstrates, the other person guesses which instrument is demonstrated." The optional homework in Module 3, Lesson 9, is, "Students observe outdoor environments and identify examples of animal and plant interactions, such as pollination."

Materials include information to guide teacher communications with caregivers.

- Materials include teacher guidance for communicating with caregivers. TheFamily Tip Sheet Overview states, "This resource, available in English and Spanish, gives families and caregivers an overview of the Ph.D. Science Texas curriculum and suggests ways to participate in and extend learning outside the classroom." In addition, the materials include a Family Tip Sheet for each module to "introduce families and caregivers to each module's phenomenon and concepts and includes an overview of what students will learn in the module, conversation starters, activities, and additional resources to learn more about the topics in the module."
- Materials include information to guide the teacher in communicating with families. The Implementation Guide mentions that the Family Tip Sheets are provided in English and Spanish.

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The materials also include rubrics to measure student performance on Science and Engineering Design Challenges. The guidance included in the Implementation Guide, under the section, "Communicating with Caregivers," states, "a completed Science or Engineering Challenge rubric should be sent home after the completion of the challenge. The rubric can be used to communicate students' progress applying conceptual knowledge to a real world problem."

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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 in 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 in 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.

- Materials include a year-long, Texas Essential Knowledge and Skills (TEKS)-aligned Scope and Sequence that outlines the order of knowledge and skills to be taught. The scope and sequence provides pacing information and standards for modules within each grade level and vertically across grade levels. The scope and sequence includes common topics within each module across grades. For example, Module 1 in grades K-2 includes lessons on weather.
- The materials include an Implementation Guide with tabs for horizontal and vertical alignments. The Implementation Guide also includes a Curriculum Map that outlines the sequence of lessons and TEKS within individual modules.
- Within the Curriculum Map, a color-coded chart includes an at-a-glance view of module titles, anchor phenomena, and spotlight lesson titles for each grade level. For example, each module has an instructional focus that is divided between earth and space science, life science, and physical science, along with TEKS aligned to each module.

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

- An introduction is included at the beginning of each module that contains information related to the anchoring phenomenon, essential questions, ways to apply learning to new contexts, and recurring themes and concepts. For example, the Module 3 introduction outlines the anchoring

phenomenon of plant recovery around Mount St. Helens in order to answer the question, "How did local plants recover after the eruption of Mount St. Helens?" Students complete an engineering challenge to design, build, and test a solution to pollinate flowers and develop an enduring understanding that different kinds of plants have different needs for growth.
- Module 1, Lesson 1, Bird Nests, provides teacher guidance and clarification on the recurring theme and concept, "throughout this module, students distinguish whether a material is a human-made resource or a natural resource, and use their learning to define the terms. Listen for students to identify that some of the materials used by the blue jay, such as candy wrappers, are human-made (2.11A)."

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

- Within each module, the materials provide a table highlighting the standards to be addressed at the beginning of each lesson set. The standards addressed within each lesson set are labeled as "introduced, addressed, or mastered." The "introduced" label appears when the content standard is being taught for the first time. The "addressed" label appears each subsequent time the content standard is covered in a lesson. The "mastered" label appears when the content standard is being assessed for the final time and mastery is expected. For example, 2.6A is an introduced standard in Level 2 Module 1, Lessons 1–3, and is later revisited as an addressed standard in Level 2 Module 1, Lesson 11. In Level 2 Module 1, Lessons 32–34, 2.6A is labeled as a mastered standard.
- Materials provide a Curriculum Map in the Implementation Guide that notes where the three major scientific components are sequenced in the modules. The Curriculum Map clarifies that "PhD Science Texas modules are sequenced to build content understanding of science ideas. Each module provides opportunities for students to explore questions and apply knowledge and skills developed in previous modules."
- The teacher guide references what students have previously learned and provides a review and practice of knowledge and skills. For example, in Module 2, Lesson 8, the section "Spotlight on Knowledge and Skills" states, "during these discussions, consider displaying the class properties of objects and materials chart that was developed during the Matter module, and review example properties such as color, shape, size, and textures."
- Teacher materials include a Check for Understanding section that reviews knowledge and skills spiraled throughout the year and guiding questions to support students who need additional support with this concept. For example, in Module 2, Lesson 2, students discuss an article they read about trash in Cateura. The note under Check For Understanding guides the teacher to "support students who do not recognize where the trash in landfills comes from." It also includes a reference chart for teachers to use to review.

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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.

The 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. 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.

- Materials include an Implementation Guide to provide guidance in implementing research-based strategies throughout the modules. For example, students are introduced to new concepts through science and engineering challenges that allow them to first observe and wonder, then investigate and deeply understand phenomena.
- The Implementation Guide includes a Product Components section that guides teachers on implementing enrichment activities to enhance student learning. These activities include conceptual checkpoints, science or engineering challenges, Socratic seminars, and spotlight lessons.
- The materials guide teachers in implementing research-based instructional strategies such as sentence stems. For example, the Differentiation Note in Module 3, Lesson 7, enhances student learning through additional content-based language supports. Materials encourage teachers to "consider providing a sentence frame, such as *I will change* _____*and then measure* _____ ."

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

- The materials include a Cross-Content Standards Correlations chart with Texas Essential Knowledge and Skills (TEKS) for ELA, math, and social studies. The chart indicates which standard is addressed and in which lessons it is taught. For example, the Math TEKS 2.9D, "...the student will determine the length of an object to the nearest marked unit using rulers, yardsticks, meter sticks, or measuring tapes," is found in Module 1, Spotlight Lesson 4, And Module 3, Lessons 6 And 15.
- Materials include a Cross Area Connection in the sidebar of Teacher Guide lessons. For example, in Module 1, Lesson 13, students discuss the properties of blocks and then create and compare block structures. The Content Area Connection Note for Mathematics states, "This lesson gives students an opportunity to use uniform rectangular shapes to analyze the parts and the whole of composed forms."
- Cross-content standards are embedded throughout the materials, including 25 grade 2 ELAR TEKS, nine grade 2 math TEKS and 15 grade 2 social studies TEKS.

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

- The materials include a Hands-On Materials Kit lists of all equipment and quantity of supplies needed to support instructional activities in each module. For example, in Module 3, materials include 8 tsp baking soda, two six qt clear plastic bins, 30 black chenille stems, 25 wooden coffee stirrers, one fava bean seed packet, 17 coffee filters, 24 pairs disposable gloves, two two-headed grow lamps. Schools that purchase the Hands-On Materials kit will receive all the items listed.
- Materials provide a comprehensive list of books found in the Core Text Library. Texts to support instructional activities are sorted by module and indicate if a Spanish translation is available. For example, *Strength in Numbers*, found in Module 3, includes a Spanish translation.

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

- Within the Implementation Guide, the section Safety in the Elementary Classroom includes guidance to support safe behavior, appropriate dress, use of personal protective equipment, and internet use in accordance with Texas Education Agency Science Safety Standards. For example, Module 3 guides the teacher to be aware that "during investigations, items can fall to the floor even when everyone is careful. Immediate removal of debris from the floor is essential to help prevent injury."
- The Teacher Edition also provides safety protocols to minimize potential hazards. For example, the Safety Note in Module 2, Lesson 9, states, "If needed, sand sharp edges before the lesson, and instruct students to handle soup cans carefully and avoid reaching into them."
- Materials provide safety considerations for teachers and students to implement. In Module 1, the Safety Considerations section guides teachers in explaining all safety considerations to students and reviewing all safety expectations before each activity. For example, "Students and teachers must put away all food and drinks during science investigations, and students must never place materials in their mouth."

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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 and 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 provide a Pacing Guide with guidance and pacing recommendations for the completion of each lesson. For example, each lesson requires 35 minutes of in-person instructional time. The guide also presents lesson objectives and activities with multiple pacing and scheduling considerations. For example, Module 2, Lesson 1 suggests breaking the lesson up into two days.
- The Pacing Guide provides a Module at a Glance with a recommended time frame for completion for each module. For example, Module 2 "...contains 34 lessons plus 14 spotlight lessons on Weather Events. Even with lesson splits and teacher choice days, this module should take no more than fifty-two days to complete. This maximum number of days ensures the implementation of all Level 2 modules within a school year with 150 days of science instruction."
- Each lesson includes an Agenda with a suggested pacing timeline in minutes. For example, in Module 1, Lesson 14, the suggested pacing for the lesson is five minutes for the "launch" activity, 25 minutes for the "learn" activity, and five minutes for the "land" activity.

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

- The materials provide teacher notes that support the strategic implementation of concepts and skills to be taught in a specific order, building upon learning in previous modules. For example, in Level 2, Module 2, focusing on sound, a spotlight on knowledge and skills states, "During these discussions, consider displaying the class properties of objects and materials chart that

was developed during the matter module, and review examples of properties, such as color, shape, size, and texture, as they are identified."

- Materials provide guidance for strategic implementation that ensures the sequence of content is taught in an order consistent with the developmental progression of science and according to the Texas Essential Knowledge and Skills (TEKS). The "Storyline" found in the appendix of each module shows the unit progression and how learning builds upon previous lessons. The materials also include a Scope and Sequence to guide teachers through the implementation of TEKS in a guided sequence of progression. For example, in Module 1, students learn the properties of matter before learning that matter can change.

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

- Materials include a Pacing Guide that allows opportunities for flexibility in completing a lesson set. In Module 1, lessons 1 through 16 are recommended to take 16 to 18 days, giving the teacher flexibility in the time spent to complete.
- The Year at a Glance guides teachers to complete all three modules in one school year through strategic monthly planning. Module 1 is taught from August to October, Module 2 is taught from November to January, and Module 3 is taught from February to April.
- Pacing suggestions are provided to teach all science content in a school year and extend the science curriculum to fit a school year that has more than 150 science instructional days. Suggestions include lessons that can be split into more than one day, cross-curricular embedding of content, instructional notes that describe time-saving strategies, and alternative instructional routines.

Great Minds PhD Science Texas Grade 2

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.	Yes
2	Materials embed age-appropriate pictures and graphics that support student learning and engagement without being visually distracting.	Yes
3	Materials include digital components that are free of technical errors.	Yes

Not Scored

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

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

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.

- The materials include an appropriate amount of white space and an overall design that does not distract from student learning. Student materials are appropriately designed to support student learning. For example, the student Science Logbook contains a balance between white space and graphics. The text on each page is clear and in an easy-to-read font. Each activity is labeled with the lesson number and then, in bold print, the activity objective. Ample space is provided and clearly outlined when students have to draw a model or write an explanation. When required, blank charts are provided to help students organize their thinking.
- The materials include an appropriate amount of white space and an overall design that does not distract from student learning. Student materials are appropriately designed to support student learning. Student materials include a spacer page between activities. Pages are age-appropriate in size with appropriate space for writing activities. Graphics and visuals are sized appropriately to be used without being distracting.
- Teacher guidance materials are appropriately designed with clear, designated places for important information. Teacher guidance materials for Module 2 have large, bold headings to identify lessons, and a smaller, purple font that denotes the different components of the lesson. Guidance materials following assessments and lesson agendas are colored in a purple color that notes importance. Important information contained in sidebars is noted by a small picture within the lesson text so as not to distract from the lesson. For example, English Language Development notes are added for the teacher through a sidebar and noted in the lesson text with a symbol of the Earth.
- The materials include an appropriate amount of white space and an overall design that does not distract from student learning. Within the Student Logbook, the text on each page is in an easy-

to-read font and font size. Each activity is labeled with the lesson number and the activity objective is in bold print.

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

- The materials embed age-appropriate pictures and graphics that support student learning and engagement without being visually distracting. The Knowledge Deck Cards include age-appropriate photographs to support student understanding and build background knowledge to support the application of the science concept of push and pull. In addition, within the Student Logbook for Module 1, students use a chart that depicts the strength of pulls when moving blocks. The images used clearly depict the strength of the pull to support student learning and engagement.
- The Student Logbooks embed age-appropriate pictures and graphics that support student learning and engagement without being visually distracting. Images are clear and cropped or zoomed to allow students to focus on the necessary part of the image. The graphics used are familiar symbols that students can easily recognize. For example, in the Student Logbook, Module 2, Lesson 21, the graphic for "listening" is the outline of a person with a hand to the ear and the graphic for "line up" is a person standing tall with arms above their head. The graphics are larger in size, labeled, and the only images on the page.
- The materials embed age-appropriate pictures and graphics that support student learning and engagement without being visually distracting. The Sound Resources section of Module 2, Sound, Teacher Manual includes graphics and images for lessons. The graphics are one per page and labeled unless included as part of a comparison or chart and then are still large and not distracting with white space. All images are labeled with the lesson number and may provide smaller text for teachers.

Materials include digital components that are free of technical errors.

- All teacher-facing materials include digital components that are free of technical errors. Within the Teacher Edition materials, all components are free of spelling, grammar, and punctuation errors.
- The materials include digital components that are free of technical errors. The Implementation Guide is free of spelling, grammar, and punctuation errors and free of inaccurate content materials or information.
- All student-facing materials include digital components that are free of technical errors. The student Science Logbook is free of spelling, grammar, and punctuation errors. Knowledge Deck Posters are free of inaccurate content materials or information. The End-of-Module Assessments and End-of-Spotlight Assessments are free of wrong answers to questions and problems.

Great Minds PhD Science Texas Grade 2

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.	Yes
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.	Yes

Not Scored

Materials are 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 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 that provides opportunities for teachers and/or students to collaborate. Materials 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 digital technology and tools that support student learning and engagement. Materials provide videos for students to view as a whole group before conducting an activity or assessment. Students also use videos and other digital technology in small groups or at stations. For example, during Module 1, Spotlight Lessons on Weather Events, Lesson 8, students rotate in groups through two different stations. At each station, students watch a video or a severe weather event. Materials do include evidence of digital technology. For example, in Module 2, Lesson 2, students visit the Mount St. Helen's Science and Learning Center website to gather information from time-lapse photographs simulating the changing landscape over time after an eruption.
- The materials integrate digital technology and tools that support student learning and engagement. While the materials provide a digital version of the student Science Logbook, even when downloaded, the logbook is not easily edited, especially with student devices. The digital Science Logbook does not integrate additional digital technology and tools that support student learning and engagement within the digital logbook.

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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.

- The materials integrate digital technology in ways that support student engagement with science and engineering practices, recurring themes and concepts, and grade-level content. Materials provide opportunities for students to obtain, evaluate, and communicate information using digital tools. Students engage with a variety of videos to obtain information related to the phenomena in the module. For example, in Module 1, Lesson 4, students view a video of a hummingbird building a nest, reflect on what they see in the video, and ask questions about what they saw. In Lesson 13, students view multiple videos of weaver birds building a nest at various stages of the building process. The teacher guides a conversation about how the two videos are similar and different, and how students think the bird will continue to build its nest. Students use these videos to reflect on the Phenomenon question, "How are smaller pieces put together to make larger objects?"
- The materials integrate digital technology in ways that support student engagement with science and engineering practices, recurring themes and concepts, and grade-level content. Materials provide opportunities for students to obtain, evaluate, and communicate information using digital tools. Students engage with a variety of videos to obtain information related to the phenomena and recurring themes. For example, in Module 1, Lesson 8, Spotlight Lessons on Weather Events, students rotate through two stations where they watch a video and observe photographs of severe weather events. As students watch the videos and look at the photographs, they record the weather hazards in a column on a table provided to them. Students also list the effects of weather hazards and discuss the similarities and differences between severe weather events.
- The materials integrate digital technology in ways that support student engagement with science and engineering practices, recurring themes and concepts, and grade-level content. Materials provide opportunities for students to obtain, evaluate, and communicate information using digital tools. For example, before students take Module 3 End-of-Spotlight Assessment, they watch a video of the Great Smoky Mountains National Park. Students discuss what they notice and wonder about what they saw in the video. Students use what they saw in the video and previous knowledge in the spotlight lessons to answer questions regarding animals in the Great Smoky Mountains National Park.

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. While teachers and students interact and collaborate daily within the materials and activities, digital technology is not utilized in order to support that collaboration. Students watch a video and then engage in collaboration through hands-on, in-person activities; however, the collaboration does not occur in a digital sense.
- The materials do not integrate digital technology that provides opportunities for teachers and/or students to collaborate. Students have the opportunity to collaborate and use their Science Logbook to record observations during investigations and activities. However, the Science Logbooks are not user-friendly in the digital format, and students cannot use them digitally to collaborate with other students or their teachers.

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

- Student-facing digital materials are accessible and compatible with multiple operating systems and devices. The materials can be accessed from a variety of operating systems and devices such as iPads, PCs, Apple computers, and smartphones. The student Science Logbooks and Knowledge Deck Cards for each module are accessible from multiple devices, and can also be downloaded as a PDF so they can be accessed without a connection to the internet.
- Teacher-facing digital materials are accessible and compatible with multiple operating systems and devices. The materials can be accessed from a variety of operating systems and devices such as iPads, PCs, Apple computers, and smartphones. The Implementation Guide and all Teacher's Editions are accessible from multiple devices, and can also be downloaded as a PDF so they can be accessed without a connection to the internet.
- Digital materials are accessible and compatible with multiple operating systems and devices. The materials are accessible online through any device with internet access. The teacher and student editions can be accessed without the internet if previously downloaded. Videos can be viewed without the internet if they have been loaded and played at least once.

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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.	Yes
2	Materials provide teacher guidance for the use of embedded technology to support and enhance student learning.	Yes
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 developmentally and grade-level appropriate and provide support for learning.

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. Materials 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.

- The digital technology and online components are developmentally appropriate for the grade level. Materials provide information that identifies how online and digital components align with grade-level science knowledge and skills. For example, in Module 1, Lesson 13, students view videos of two different baya weavers building their nests. Students reflect on materials used to build the nest and the process the baya weaver takes to build the nest. A Spotlight on Knowledge and Skills sidebar note states, "As students describe how the bird creates its nest, listen for them to describe how pushes and pulls are used to create the nest and change the shape of the materials. (2.7A)." This example indicates the video is aligned with the grade 2 TEKS and is grade-level appropriate. Materials also connect the video example to learning in previous modules and the recurring themes.
- The digital technology and online components are aligned with the grade-level scope and approach to science knowledge and skills progression. The provided video links support the objective of each lesson. The aligned TEKS can be found under the section titled "Standards Addressed" before the start of each concept in every module. For example, in Module 3, Lesson 9, students watch a video of a bumble bee moving to different flowers and discuss what they observe. The video and discussion support TEKS 2.12C, as students "Explain and demonstrate how some plants depend on other living things, wind, or water for pollination and to move their seeds around."

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

- The materials provide teacher guidance for the use of embedded technology to support and enhance student learning. The materials provide specific teacher guidance for embedding the technology within lessons and assessments. The materials include times that teachers need to play specific videos in order to set the stage for a lesson or assessment. In addition, the materials provide sidebar teacher notes that offer additional technology ideas and components to support student understanding if needed. For example, in Module 1, Lesson 1, optional homework is presented for students to look for local birds and bird nests near their homes and draw what they see. A sidebar teacher note states, "Students who live in urban areas may benefit from visiting websites such as the Cornell Lab of Ornithology (http://phdsci.link/1522) to see bird nests online. Consider sending parents or guardians the link so they can help students view the site (2E)."
- The materials provide teacher guidance for the use of the embedded technology to support and enhance student learning. The materials provide specific teacher guidance for embedding the technology within assessments. For example, before students take the End-of-Module assessment in Module 3, the teacher plays a video of Mount St. Helens using the provided embedded, clickable link, "http://phdsci.link/2460." The materials guide the teacher to highlight key ideas from the video, including how scientists were able to see plant recovery from the eruption on Mount St. Helens.

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

- The materials include resources for parents and caregivers on how to support student engagement with digital technology and online components. Within each level and module, a family tip sheet is sent home to provide guidance to parents and caretakers on concepts learned within the module. For example, in Module 1, the materials give additional resources and state, "Find current and past weather data at https://www.wunderground.com/"
- The materials include resources for parents and caregivers on how to support student engagement with digital technology and online components. The materials provide a Tips for Families letter for each module with information on lesson overview and activities families can do at home. This letter provides external links for families to visit to learn more about the topics being studied in class. For example, in the Tips for Families letter in Module 3, there is a link to learn more about the Big Thicket National Preserve and the plants and animals that live there, "https://www.nps.gov/bith/index.htm."