Great Minds PhD Science Texas Grade K

Great Minds PhD Science Texas Grade K 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.

Great Minds PhD Science Texas Grade K

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 within the module. For example, TEKS K.12A is introduced in Module 2, Lessons 1–3, addressed in Module 2, Lessons 6–21, and mastered in Module 2, Lessons 34–36. The module provides hands-on activities for students to practice and multiple checks for understanding to support mastery of TEKS K.12A.
- The materials provide multiple opportunities to develop and practice grade-level appropriate engineering practices, as outlined in the TEKS. For example, in Module 3, Lesson 11, students explore six stations and "...use models to investigate the effects of changing the order of the

parts needed to form a shadow." Students record their observations in their Science Log and discuss the results.
- Materials include a Check for Understanding section and an End of the Module Assessment for students to demonstrate mastery of grade-level appropriate scientific practices. For example, in Module 1, Lesson 2, the teacher is guided to use the question "How is the model like a cliff dwelling?" to check for understanding. In Module 1, Lesson 2, students will "...synthesize their learning of shelter in an End of Module Assessment."

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." The recurring theme of "cause and effect" is found in Module 1, Module 2, and Module 3.
- The materials provide multiple opportunities to make connections between overarching concepts and recurring themes. For example, "patterns" is a recurring theme across modules. In Module 3, students sort pictures of the sky and make connections to other scientific concepts, such as light. The Sidebar Note guides teachers to listen "...as students justify their ideas about how to sort the cards and describe patterns of day and night."
- Materials include a Reflect on Recurring Themes section that provides opportunities to make connections between and within overarching concepts. For example, in Module 2, Lesson 36, students use "...the lens of cause and effect throughout the module to understand different phenomena." Teachers guide students to "...continue to apply the lens of cause and effect to answer questions and find links between scientific ideas as they explore new situations."

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 that shadows can appear in places with light, and at the end of the module, students "...are able to explain the way light interacts with objects affects what people see."
- 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 better understand the anchoring phenomenon. 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 and conduct classroom observations to develop an understanding of science concepts. For example, in Module 2, students generate questions about the differences between Mara and Wonderland of Rocks. The questions are recorded on sticky notes and placed on the Driving Question Board. During the module, “Students will return to the Driving Question Board as they try to answer their questions and ask new ones."
- Within the modules, students are provided opportunities to plan and conduct classroom investigations. For example, in Module 2, Lesson 6, students create an investigation plan with a question, claim, the materials needed, and the process of investigation of different bean plants. Students conduct their investigation following their plan.
- 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 Sidebar Note, the teacher “support[s] the development of counting and numeracy skills and mark or circle groups of 5 on the weather log for numbers greater than 5.”

Great Minds PhD Science Texas Grade K

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 embedded phenomena across lessons to support students in applying scientific practices. The Curriculum Map identifies anchor phenomena, supporting phenomena, and student-generated phenomena found in each module. For example, the anchoring phenomenon in Module 3, Spotlight Lessons on Sky, is a bat sighting in Austin.
- Materials embed problems across lessons to support students in developing knowledge through engineering practices. For example, in Module 1, students find patterns in weather and discuss how severe weather affected ancestral people. The Engineering Challenge allows students to use the engineering design process to build a model of a shelter that would protect archaeologists from the warming effects of sunlight.
- At the end of each unit, students revisit the initial phenomena question and develop knowledge through the authentic application of scientific practices. For example, in Module 2, Lesson 5, students review the question, "How can we describe Mojave Desert plants?" Students work with a partner to describe photographs of plants, draw a plant in their Science Logbook and answer questions such as, "How is your partner's plant similar and different from your plant?" The application of the phenomenon allows students to "...recognize plants need water and light to live and grow."

Great Minds PhD Science Texas Grade K

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 share what they know about deserts before "...students build knowledge about deserts throughout the first three lessons." When students share relevant experiences that connect with the anchoring phenomenon, teachers are guided to "...record their responses on the board."
- The materials allow students to connect prior knowledge to predict related phenomena. For example, in the Student Edition, Module 2, students apply prior learning about air to predict what a pepper plant would look like without air.
- The materials guide teachers to collect and display evidence of students' prior knowledge. For example, Module 3, Lesson 1, guides teachers to "...elicit student's prior experiences with shadows by asking, 'Where have you seen shadows?'" The teacher records student responses on an anchor chart to make connections to why a soccer ball does not have a shadow.

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

- The materials include a "Prepare" section that details the scientific concepts and student learning goals behind each phenomenon. For example, in Module 3, Lesson 6, the scientific concept is sight and why we need light to see objects. The learning goal is "Students will analyze data they collect to determine that objects are visible when the light illuminates the objects."
- The materials include a Pacing Guide with anchor phenomenon, an essential question, a goal statement, and TEKS alignment for each cluster. For example, in Module 2, the anchoring phenomenon is Life in the Mojave Desert, and the essential question is, "How is Mara different from the Wonderland of Rocks?" The focus question is "Why are plants able to live in some environments but not others?" the goal is "...students will understand that plants live and grow in environments that have what plants need."

Great Minds PhD Science Texas Grade K

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 6, students conduct an investigation to determine that plants need water and light to live and grow. Students will “...continue to develop their understanding of plant needs in Lessons 11 and 12 when they make observations to determine that plants also need air, nutrients, and space to grow."
- 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. For example, in Module 3, students begin learning how light is needed to see objects and end learning how puppeteers use light to tell stories during

wayang shows. Materials describe how students will continue connecting knowledge across the unit, stating "...in later levels, students will identify a daily pattern in the Sun's changing location."

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

- Materials are intentionally sequenced to scaffold learning in a way that allows for increasingly deeper conceptual understanding. In Module 1, Weather, students will establish what weather is and consider how weather affects people as they learn about the anchor phenomenon, the cliff dwellings at Mesa Verde. In Concept 2, Lessons 17 through 20, students look for patterns in daily temperature by collecting weather data. In Concept 3, Lessons 22 through 24, students observe parts of weather that make up different kinds of severe weather.
- 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 interactions between light and objects to establish that shadows can appear in places. Students investigate using different materials to determine which material would work best as a wayang screen. Students then use their selected screen to present their wayang show to the class. Through this intentional learning sequence, students "...identify patterns between light and objects."
- Materials include a Building Content Knowledge section that provides an overview of how students will engage in the content through groups of lessons known as concepts that build in complexity. For example, in Module 2, students engage with the anchor phenomenon related to life in the Mojave Desert through video tours of two desert environments. Students create a model to compare the environments, ask questions that will drive investigations throughout the module, and conduct an investigation to determine what bean plants need to live. Students move into more abstract understandings as they analyze photographs of plants to recognize patterns, and order cards that show plant progress through life cycle stages. Students apply their learning to the next concept and identify similarities and differences between plant and animal needs.

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 1, Lesson 2, the Teacher Note clarifies the difference between the terms rock and stone. The note states "Throughout this module, students observe and discuss the cliff dwellings of Mesa Verde. Students may use the terms rock and stone when discussing the cliff dwellings. These terms are often used interchangeably, but their meanings are slightly different. The term rock most often refers to naturally occurring mineral substances that form from Earth's interior and surface. The term stone most often refers to a rock that has a purpose or function. At this level, students do not need to understand the difference, and the terms may be used interchangeably."
- The materials accurately present core concepts and recurring themes and concepts. For example, in Module 3, students learn about different sources of light and how they interact with objects. The core concept is, "People can see objects when light illuminates the objects or when

objects give off their own light." Student misconceptions are addressed in the Teacher Note sidebar in lesson 7, which states, "Some students might have the misconception that all light sources stop working during a blackout." Materials give teachers suggestions to clearly present the grade-level-specific core concept that allows students to recognize light sources that work without electricity.

- The materials clearly present science and engineering 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 2, students walk around the classroom, observe shadows, and record their observations. Students change the light source and observe and record data again. Students then use sentence stems to explain their observations.

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 standards are expected to be mastered and which will continue to be developed. Within the component, the bold text identifies standards students should master, and italicized text identifies standards students will master in later lessons. For example, the TEKS K.9B, "...*students are expected to observe, describe, and illustrate the Sun, Moon, stars, objects in the sky and clouds*" is italicized to indicate the concept will be developed further to gain mastery.
- Materials include Conceptual Checkpoints to provide mastery requirements within the boundaries of the main concept of the grade level. For example, in Level K, Module 1, Lesson 11, the Conceptual Checkpoint guides the teacher to show students a weather recording sheet. The students will "...use the information on the weather recording sheets to identify and circle the picture of the warmer place."
- 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 Module 3, Task 4B, the learning statement for mastery states, "The student uses observations to explain (K.3B) that when the rocks are in the path of light (K.5B), mariners can see them (K.8A)."

Great Minds PhD Science Texas Grade K

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.

- 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 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 don't students learn that light entering the eye enables sight?" The materials reference the Texas Essential Knowledge and Skills (TEKS) alignment from kinder-grade 5, stating, "In this module, students focus on the general relationship between light and sight. To meet the learning expectations for K.8A, students must articulate that people need light to see objects. This understanding builds a foundation for future learning in Level 5 (grade 5), when students learn that people can see an object when light reflected from the object's surface enters their eyes."

- 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 1: Weather, the TEKS K.9A is italicized to identify the TEKS is 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 identifies common misconceptions students may have in each module and grade level, as well as an appropriately developed understanding of the concept. For example, in the Level K Module, a common misconception is, "...air temperature is always cool during rainy weather and warm during sunny weather." The developed understanding is, "...cloud cover, rain or snow, air temperature, and wind are different parts of weather that can be described individually."
- 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 an Additional Reading for Teachers section that provides articles and other reading options to support teachers' pedagogical and content understanding. For example, in Module 3, students learn about light with an emphasis on the Wayang Puppet Show. The materials include two articles for teachers to read that explain more about the Southeast Asian countries' tradition of shadow puppet shows. The articles include:
    - "Wayang Kulit: Indonesia's Extraordinary Shadow Puppetry Tradition" from the Asia Society website (http://phdsci.link/1608)
    - "The Shadow Puppet Theatre of Malaysia: A Study of Wayang Kulit with Performance Scripts and Puppet Designs" by Beth Osnes (Note: As indicated by the name of the source above, wayang shadow puppetry is a tradition in Indonesia and several other Southeast Asian countries, including Malaysia.)
- 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. Module 2, Lesson 1, provides an explanation about the anchor phenomena in the sidebar Teacher Notes. The science concept is, "The Mojave Desert is named for the Mojave people, who lived in that region for thousands of years—and still do. One translation of Mojave is 'beside the water.' The Mojave people lived along the Colorado River in parts of what are now the US states of Arizona, Nevada, and California. A barrier to student conceptual development is considered and the teacher is guided to "...avoid revealing the meaning of Mojave. Consider providing this translation later in Concept 1, when students learn about water sources in the desert (3D)."

Great Minds PhD Science Texas Grade K

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.”
- 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, Weather, “Students observe or measure cloud cover, rain and snow, temperature, and wind to describe the weather. Lesson 4: Record observations of cloud cover, rain, and snow. Lesson 5: Learn how to use a thermometer to measure temperature. Lesson 6: Design a tool to measure the wind. Lesson 7: Create, improve, and share a wind measuring tool.”

Great Minds PhD Science Texas Grade K

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 provide a description of 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 Module 2, Lessons 1-3, students "...go on video tours to take a closer look at two locations in the Mojave Desert." After viewing the video, "...students record their observations in their Science Logbooks drawing as many features of this environment as they can." Students use observations to create a model of a desert environment using stickers in their Science Logbook. As students develop their models, teachers encourage students "to think carefully about where they are placing each sticker and to consider their reasoning for each choice."
- The materials consistently provide learning activities that support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers. For example, Module 3, Lesson 4, includes questions for the teacher to ask before, during, and after the reading of the text, *Blackout.* The teacher uses two models to represent the main character's bedroom before and during a blackout. Students work in groups to make observations of each model and record the findings in their Science Logbook. Students engage in meaningful sensemaking as they discuss why they think "...the boy could see objects well before the blackout and not as well during the blackout."

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

- The materials provide multiple 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 concepts. For example, the Module 1 Knowledge Deck provides three reading passages; *Mesa Verde Long Ago, Farming at Mesa Verde*, and *Ancient Clues* that support understanding of the module anchor phenomena of the cliff dwellings at Mesa Verde. In Module 1, Lesson 2, the teacher reads *Mesa Verde Long Ago* to discuss what they learned from the passage and develop student understanding that a cliff dwelling is a home.
- The materials provide multiple opportunities for students to engage with scientific texts to gather evidence and develop an understanding of concepts. Each module has one book that relates to the module phenomena. For example, in Level K, Module 2, students explore the text *A Day and Night in the Desert* to connect desert animals with their habitats. Before reading, students analyze the book cover to draw conclusions to questions such as "What do you think this book is about?" and "Why do you think that?" The materials also provide a Teacher Note in the sidebar to develop an understanding of concepts through clarification of scientific terms. For example, the materials clarify, "The definition of oasis in *A Day and Night in the Desert* differs from the definition that appears in Lesson 16."
- The materials provide multiple opportunities for students to engage with scientific texts to gather evidence and develop an understanding of concepts. For example, in the Module 2 Extension Activity, "Students will work individually or in groups and identify plant parts to compare Mojave Desert plants and Chihuahuan Desert plants." Students will use books or computer devices and websites to research different plants in the Mojave and Chihuahuan Deserts. The materials provide links for students to explore and direct students to the "...plant pages of the National Park Service websites for the Mojave Desert (https://www.nps.gov/moja/learn/nature/ plants.htm) and a Texas park in the Chihuahuan Desert (https://www.nps.gov/bibe/learn/nature/ plants-of-big-bend.htm)."

Great Minds PhD Science Texas Grade K

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 multiple opportunities for students to demonstrate an understanding of scientific concepts in graphic modes. For example, in Module 1, Lesson 7 of the Student Logbook, students use a graphic of a thermometer to draw a line to indicate the temperature. Students also circle the color bands to identify the description of the temperature as "...very hot, hot, warm, cool, cold, and very cold."
- The materials provide multiple opportunities for students to engage in various written and graphic modes of communication to support students in developing and displaying an understanding of scientific concepts. In the Science Logbook, students use words and images to record observations and thoughts after gaining knowledge of key concepts. For example, in Module 2, students observe and make claims about the desert animal, the bighorn sheep. Students analyze videos, photos, and animal cards to draw conclusions about the body parts that help these animals survive. Finally, students observe a video of bighorn sheep in action and document their observations in their Science Logbook, using words and pictures.
- The materials provide multiple opportunities for students to display an understanding of scientific concepts in written form. For example, in Module 3, Spotlight Lesson 8, students compare seasonal weather conditions in two different locations to determine where the Congress Avenue Bridge bats go during the winter. After students conduct the investigation, they circle the location bats travel to in the winter in their Science Logbook. Students also cite the evidence for their claim using the provided sentence stem, "I think the bats go there because…."

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 to act as scientists and engineers and help them persevere through concepts with productive struggle. 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 1, students follow the engineering design process to build shelters for shade to keep archaeologists cooler. Students identify the problem and potential solutions, create a drawing to depict the problem and solution, and use materials to build a shelter. Students test their structures using flashlights to represent the sun and record their data. Afterward, they make changes to improve their solution and reflect on their progress.
- 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 1, Lesson 15, students use a design they built in a previous lesson to determine if it provides enough shade to be considered successful. Students use their observations to work with a partner to revisit their plans and make improvements to increase the shade for the shelter. The teacher provides guiding questions to lead the students in focused conversations. Students use their new plans to improve their existing shelters and test them again.
- The materials provide authentic student engagement and perseverance of concepts through productive struggle while acting as scientists and engineers. For example, in Module 3, Lessons 16-19, students engage in an Engineering Challenge to explore how light interacts with different

materials. Students select the material they think will work best as a screen, build and test their model and discuss which screens work best and what similar properties they share. The Teacher Note describes what to do if some groups selected materials that did not work; “Encourage these groups by explaining that an unsuccessful solution offers valuable insight into what works best in a given situation.”

Great Minds PhD Science Texas Grade K

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 5, students learn how to use a thermometer to measure temperature. Students work to prove there is air in the classroom by collecting a sample of air from different locations in the classroom. After students use a baggie to collect air, the teacher prompts students with the question, "Did you trap air?" and "What is your evidence?"
- The materials provide opportunities for students to develop using evidence to support hypotheses and claims. In Module 2, Lesson 9, Science Challenge, students look for evidence to support the claim that bean plants need water and light to live. Students use a blank sticky note and work independently to find additional evidence on a data chart. Students mark the evidence they find by placing their sticky notes on it. After students place their sticky notes on the data chart, they take turns explaining to their group why they placed their sticky notes where they did. As students share, the materials guide the teacher to "visit each group to observe how students use data as evidence to support the claim."
- The materials specifically prompt students to use evidence when supporting their hypotheses and claims. For example, in Module 3, Spotlight Lessons on Sky, the End-of-Spotlight Assessment prompts students to make a claim and support it with evidence. Students analyze a picture to

determine if it is day or night. Students then write their claim using the provided sentence starter, “I know the time of day because the sky is….”

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

- The materials present scientific vocabulary using multiple representations. In the Module 1 Teacher Guide, students work in groups to learn about severe weather such as tornadoes, hurricanes, and blizzards. The teacher assigns each student a kind of severe weather to act out to their classmates. The materials provide support for students to act out their vocabulary words, stating, “If students need support to think of ways to act out a thunderstorm, ask them about the weather they observed in the thunderstorm video and photographs. Students should consider how to act out parts of weather, such as rain and wind, and other characteristics of thunderstorms, such as thunder and lightning. Use the reenactments to reinforce the concept of severe weather.”
- The materials include opportunities to develop and use vocabulary after having a concrete or firsthand experience to contextualize new terms. In Module 1, Lesson 1, students examine a photo of people in a tent to understand how the tent provides protection from the weather. Students then work in groups to construct a tent, explain their building process and describe what they would do inside the tent. Students compare the weather in the photo to the weather in their own town and decide which tent would be more effective in protecting people against the weather. After these hands-on activities, the teacher introduces the vocabulary term “shelter” as “something that covers and protects people from the weather and that shelters can help keep people safe and comfortable.” The students connect the new word “shelter” to other types of shelters and share their ideas.
- The materials present scientific vocabulary using multiple representations. For example, in Module 3, Lessons on Light, students learn the vocabulary word “shadow.” Students observe photographs and models that contain and don't contain shadows to compare similarities and differences. Students explore outside and inside the classroom to find shadows and create shadows by building a model of a Wayang puppet show. The teacher provides a student-friendly definition of shadows after students explore shadows and how they are created.

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 grade-level appropriate opportunities for students to practice participating in argumentation and discourse. In Module 1, Lesson 25, students engage in discourse using the instructional routine “Step In–Step Out.” During this instructional routine, the teacher shares “a statement with which students can either agree or disagree. Students who agree with the statement step inside the circle. Students who disagree remain on the edge of the circle. Ask two to three students inside of the circle and two to three students on the edge of the circle to share their reasoning. Restate the prompt, and then give students at least one opportunity to change their response and share their reasoning.”
- The materials integrate argumentation and discourse within stages of the learning cycle. For example, in Module 3, Lesson 3, the teacher explains to the students that they will create a model to show what they have learned. The teacher guides the students to think about the first step of creating their module which is selecting the parts. Students use their Science Logbook to

determine which parts they think should be included in their model and share their thinking with the class. While listening to their classmates, students use a nonverbal signal to show whether they agree or disagree and are called on to share their reasoning.

- The materials provide grade-level appropriate opportunities for students to develop and participate in argumentation and discourse practices. Within the Implementation Guide, the section "Supporting Scientific Discourse" provides student expectations for discourse within the classroom. The materials state that students will "Actively and effectively participate in discussions and collaborations, building on the ideas of others and clearly communicating their own ideas." One expectation for the presentation of information and ideas is to "present information and results in an organized presentation employing eye contact, speaking rate, volume, enunciation, natural gestures, and conventions of language to communicate ideas effectively."

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 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. Module 1, Spotlight Lesson on Weather, allows students to construct understanding through the drawing of various types of severe weather and share their writing with a partner. Students share their drawings with the class and explain how this kind of severe weather could be harmful to their community. The "Check for Understanding" side note suggests if students need support to present how a severe weather event could affect their community, "consider providing the following sentence frame: A [kind of severe weather] can be harmful because."
- The materials provide criteria for developmentally appropriate arguments to explain a phenomenon or defend a solution to problems using evidence acquired from learning experiences. For example, in Module 2, the End-of-Module Assessment provides a rubric to evaluate student presentations on claims they have made. Within the rubric, the "student analyzes evidence from the image (K.2B) and uses patterns (K.5A) to select a claim (K.3A) about whether humans at Mesa Verde could get what they needed (K.11) from their environment (K.12B)" and "The student uses patterns as evidence (K.5A) to explain (K.3A) the relationship between human needs (K.12B) and one or more natural resources (K.11) at Mesa Verde."
- 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, Spotlight Lesson on the Sky, students investigate how weather and seasonal conditions vary in different locations to determine where bats in Austin go for the winter. The materials reference previous lessons in which students compared the temperature in various cities to support their new claim. In the lesson, students circle where they think bats travel for the winter and write evidence to support their claim, using the sentence stem, "I think the bats go there because…." After recording their claim with evidence, students move to different parts of the classroom based on their initial claim and present their evidence to students who made the same claim.

Great Minds PhD Science Texas Grade K

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 7, students implement the engineering design process to design a tool to measure the wind. After students create and improve a wind measuring tool, the materials provide question stems and anticipated student answers. One question prompt states, "Did your wind measuring tool work and how do you know?" Possible student responses include, "Our tool worked because it moved a little with the fan and a lot with the hair dryer" and "Our tool didn't work because the materials moved the same in front of the fan and the hair dryer." As students use different materials to improve their wind measuring tools, the teacher prompts students with questions to deepen their thinking such as, "What would make your tool better?" and "What changes did you make to your tool and why do you think those changes will make your tool better?"
- 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, Spotlight Lesson 6, students view a photograph of the Congress Avenue Bat Bridge in Austin and the teacher asks, "What do bats need to live?"

Possible student answers are listed below. The materials guide the teacher to confirm student responses, "...bats, like all animals, need food, water, and shelter to live." The teacher then asks the following questions to deepen student thinking: "How might changes in weather stop a bat from getting what it needs?" and "How can we explore if changes in weather make bats change how they meet their needs?"

- The materials provide teacher responses to possible students' responses, including how to build on students' thinking. For example, in Module 3, Lesson 1, students observe two pictures of a soccer ball at different times of the day and answer questions to explain what they see in each picture. The materials guide the teacher to anticipate student responses and "Confirm that the soccer ball does not have a shadow in Place B because the soccer ball is in the shade." Students engage in the "Think-Pair-Share" instructional routine to answer the following questions to deepen their understanding: "Do you think you would find more shadows outside on a sunny day or outside on a cloudy day?" and "Why do you think that?"

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

- The materials provide embedded support for the teacher in how to introduce and scaffold students' development of scientific vocabulary. For example, in Module 1, Lesson 3, students describe the weather and the teacher records student responses. To support student vocabulary development, the teacher displays weather symbols and supports students to match each symbol with the weather word it represents. A Teacher Note within the materials states, "If needed, use the weather symbols to help students generate words that describe different parts of the weather. Consider leaving this chart on display for the next few lessons so students can refer to it as they continue to explore different parts of weather."
- The materials provide embedded support for the teacher to prepare for vocabulary introduced in the module. Materials provide teachers with a Module Overview that provides a preview of the lesson vocabulary. For example, in Module 2, Lessons about Life, the materials list the vocabulary words "...claim, desert, environment, evidence, growth, living thing, natural resource, oasis, and opinion." To support the development and use of scientific vocabulary in context, students "...learn the following terms through investigations, models, explanations, class discussions, and other experiences."
- The materials provide guidance for the teacher on how to support students' use of scientific vocabulary in context. For example, in Module 3, Spotlight Lesson 4, students create a model of the sky at two different times of the day. The teacher guides students to create and label a model of the sky using the vocabulary, "...sun, moon, and stars." The "Differentiation" note provides teacher guidance to scaffold the writing task and suggests, "Support students' writing by displaying the class charts from Lessons 2 and 3 that include the words Sun, Moon, stars, dawn, dusk, day, and night."

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

- The 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 3, Lesson 13, students use the evidence they collect to create a claim about where shadows form and why. The teacher asks questions to support students in creating a claim with evidence such as, "Do you think the sun causes your shadow to form in different places?" and "What makes

you think so?" After students share their responses orally, the teacher models writing a claim on the board.

- 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 that "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, evidence prompts include "What is your evidence?” “Could you give us an example?” “What observations or data support your thinking?” and “ How do you know?"
- 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 support and guide teachers in facilitating the sharing of students' thinking and finding solutions. For example, in Module 1 Lesson 9, students select a question that is related to weather and the Phenomenon Question, “How does the weather affect us when we play at the playground?” Students engage in a Whip Around, a collaborative conversation routine that gives each student an opportunity to respond. During the Whip Around, students share their questions one by one until all have participated. Students with a question similar to another response use a nonverbal signal to show they agree instead of repeating a response. The teacher then reads the recorded questions aloud and students use nonverbal signals to show whether they think they can use the school's playground to answer each question.
- The materials provide teacher support and guidance to engage students’ thinking in various modes of communication throughout the year. For example, in Module 3, Lesson 7, students discuss whether people can or cannot see during a blackout. Using prior knowledge of blackouts, students make a claim and support it with evidence. Students will share their claims and evidence with the class. The sideline note under “Content Area Connection: English” supports the sharing of students’ thinking and states, “If students need additional writing support, consider creating groups for them to rehearse orally what they will write or to discuss the evidence they will include.”
- The materials provide teacher support for facilitating the sharing of students’ finding solutions. For example, in Module 3, students create a wayang puppet show model. Students use their knowledge of shadows and light to select the best screen for their model. After students select and test their material, the teacher asks questions such as, “Did the material your group chose work well as a wayang screen? Why or why not?” Students share their model with the class and explain their screen material choice. During the student presentation, the teacher instructs the class to actively listen to their explanation and think about whether they agree or not. The

teacher asks questions about the outcome such as, “How did light interact with the material?” Students also get the opportunity to discuss which material should not be used and why.

Great Minds PhD Science Texas Grade K

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 as well as 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 either an Engineering or Science Challenge and an End-of-Module Assessment. Spotlight Lessons include either an Engineering Challenge or 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.” In Module 1, Lesson 4, students sort a set of cards by looking at the cloud cover. A sidebar Check for Understanding note includes the teacher assessment guidance, “Listen for students to compare and describe the amount of cloud cover shown on the weather cards. Students may need support to sort the

cards based on cloud cover. Have them begin by comparing two cards. Ask students to determine whether one card shows more clouds than the other or if both cards show the same amount of cloud cover. Continue having students compare two cards at a time until they can identify relative relationships between cards that show different amounts of cloud cover (K.9B, 3H)."

- 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 29, students apply their understanding of weather and how weather affects people. Students watch part of a "Blizzard of 1978" video and answer questions about the weather conditions, temperature, evidence of wind, safe shelters for blizzards, and weather data analysis. 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 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 Rubric that includes the TEKS assessed by each item, as well as evidence of student work that meets expectations for each standard. For example, in Module 1, End-of-Module Assessment, item number one assesses the TEKS K.1F, K.9B, K.10B, and K.10C. The rubric identifies criteria for evidence of student work that meets expectations and states, "The student identifies and records (K.1F) the parts of weather including clouds (K.9B), the temperature change to cold (K.10B), and strong winds during a blizzard (K.10C)."
- Materials assess all student expectations over the breadth of the course and indicate which student expectations are being assessed in each assessment. Each lesson includes a Check for Understanding section that includes the TEKS being informally assessed. For example, in Module 3, Lesson 2, one of the Check for Understanding tasks states, "As students discuss the properties of each light source, listen for students to name specific properties (K.5E) of the objects, such as size, shape, color, texture, or materials (3H)."

Great Minds PhD Science Texas Grade K

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 or Science 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 construct a shelter model that would protect archaeologists working under the sun. Students identify the problem, experiment with different materials to determine their shading properties, and then design, build, and refine their shelters. Finally, they present their shelters to the class and learn that shelters serve various purposes, including shielding from weather conditions.
- 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 the Sky, students investigate patterns in day, night, weather, and seasons to identify where the Congress Avenue Bridge Bats travel in the winter. Students then apply this knowledge to a new phenomenon during the End-of-Spotlight Assessment to explain why opossums change the time of day they are active during different seasons.

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. Students engage in an Engineering Challenge that requires students to apply knowledge and skills to a new problem. For example, in Module 1, Spotlight Lessons on Magnets, students build on their understanding of the properties of magnets and explore how people can use magnets to push and pull. During the Engineering Challenge, students apply their knowledge of how they can use magnets to push and pull to solve the problem of pieces falling off a board game while traveling. Students use the engineering design process to design a solution to answer the question, "How can we use magnets to keep pieces on a board game?"
- Materials include assessments that require students to apply knowledge and skills to a new phenomenon or problem. For example, during the Conceptual Checkpoint found in Module 2, Lesson 27, students apply their previous learning about the animals of the Mojave Desert to answer questions about what squirrels need to live, where they live, their body parts, and the functions of their body parts.
- Materials include assessments that require students to apply knowledge and skills to a new phenomenon or problem. For example, in Module 3, students explore light and how it interacts

with objects. Students explore how shadows form and different sources of light. Students investigate how light travels differently through different materials. Students explore how mirrors can change the direction of light. Students apply their knowledge of light within the End-of-Module Assessment by explaining how lighthouses help mariners and how much light travels through different parts of the lighthouse.

Great Minds PhD Science Texas Grade K

Indicator 6.2

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

1	Materials include information and/or resources that provide guidance for evaluating student responses.	M
2	Materials support teachers' analysis of assessment data with guidance and direction to respond to individual students' needs, in all areas of science, based on measures of student progress appropriate for the developmental level.	M
3	Assessment tools yield relevant information for teachers to use when planning instruction, intervention, and extension.	M
4	Materials provide a variety of resources and teacher guidance on how to leverage different activities to respond to student data.	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 "ask" stage is provided in the materials and states, "The student describes the role of archaeologists and engineers (K.4B) and defines the problem (K.1A) as the scientists being too warm in the sunlight. The student then draws a picture of a solution (K.1B) that would help shelter the archaeologists (K.12B) by blocking the sunlight (K.8B)."
- Materials include information that guides teachers in evaluating student responses. In the Module 3 End-of-Module Assessment, students answer five multiple-choice questions and two written response questions. The materials include an answer key with sample student responses for the written response questions. The inline Teacher Note in Module 3, Lesson 23, 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 23, 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 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 assessment.

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. 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 21, students engage in a

Conceptual Checkpoint in which they analyze one month of temperature data from Mesa Verde to identify patterns in daily temperature. An inline data chart provides evidence for students who show mastery of the skill or concept and states, "Students analyze the Mesa Verde temperature chart (K.2B) and then circle the green temperature band on the morning thermometer, the yellow temperature band on the afternoon thermometer, and the green temperature hand on the night thermometer (K.10B)." The materials provide teacher information for planning intervention for students who do not master this concept stating, "If students do not circle the temperatures that happened the most, revisit the stack of linking cubes together. Ask guiding questions such as these: Which stack of cubes is tallest? Which stack has the most cubes?" After debriefing the Conceptual Checkpoint as a class to clear up misunderstandings, the materials provide a sidebar Extension Note that states, "Work with students to make connections to objects that people use in their home to protect themselves from different parts of weather (e.g. air conditioning, furnaces, awnings, curtains) and then generate a list of these objects (3F)."

- The information gathered from the assessment tools helps teachers when planning extensions. For example, in Module 3, Lesson 2, students work as a group to sort light source cards into different groups based on properties or the location in which they are found. The Check for Understanding section for this activity describes what the teacher is listening for when rotating to different groups. The Teacher Note provides an extension to the activity which states, "The goal of this activity is for students to identify properties as they generate ways to classify the light sources. If time allows, encourage groups to sort the cards in a different way."
- 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 8, states, "If students select an incorrect response, remind them of the basement model from Lesson 5. Then ask questions such as these: Could you see an object inside the basement model if the object was blue? Could you see the object if it was slimy? Could you see the object if it gave off its own light?"

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-Module 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 4b, the materials provide next steps that state, "support students with analyzing severe weather data patterns by using materials found in Lesson 25. To provide further support for describing objects in the sky, review Lesson 22 materials with students."
- 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 assessment is, "Use materials in Lesson 5 to support students with collecting evidence that wind is moving air." This addresses item number 2 and TEKS K.1E and K.10C.
- Materials provide 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. Suggestions include guided questions or a review of previous learning and materials. For

example, in Module 2, Lesson 1, the Check for Understanding sidebar notes, “In this lesson, students record observations (K.1F) of the desert. As students work, look for evidence that their drawings represent features of the environment they observed. To determine what students are drawing, consider asking questions such as the following: ▪ What part of the Wonderland of Rocks are you drawing? ▪ How does your drawing show what you observed in the video tour? If students need additional support, revisit the scientist’s notebook entry (Lesson 1 Resource B) from earlier in the lesson. Ask students to think about what details the scientist captured in his drawing.”

Great Minds PhD Science Texas Grade K

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 and free from errors. 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 11, students complete a Conceptual Checkpoint assessment in which they use a light-colored crayon to show where air is found in an image of Mesa Verde. Students also circle flags that show evidence of wind. These questions directly align with the grade level standard K.10C, where students identify evidence that supports the idea that air is all around us and demonstrate that wind is moving air.
- 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 Module 1, students complete formative assessments to demonstrate an understanding of how the cliff dwellings of Mesa Verde protected the Ancestral Pueblo people from the weather. The materials provide background information to provide culturally accurate and relevant information in order to build fair and impartial background knowledge for all students.
- 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, during the Conceptual Checkpoint in Module 2, Lesson 19, students use their previous learning and observe a chart with two

different plants, one healthy and one unhealthy, to determine what the healthy plant gets from its environment. Students answer questions to demonstrate an understanding of all components of TEKS K.12A, "Observe and identify the dependence of plants on air, sunlight, water, nutrients in the soil, and space to grow."

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

- Within the materials, assessment tools use clear pictures and graphics that are developmentally appropriate. For example, in the End-of-Module Assessment for Module 1, the materials provide symbol icons to represent different weather conditions such as sunny, partly cloudy, cloudy, rainy, and snowy. The graphics are clear and easy to differentiate from one another. Additionally, the assessment includes a visual of a thermometer. In this graphic, the numbers and the color bands that indicate temperature ranges are easy to read and identify.
- Within the materials, assessments contain pictures and graphics that are developmentally appropriate. For example in Module 1, Lesson 27, students analyze a graph depicting the frequency of severe weather events. The materials use symbols to represent severe weather such as blizzards, tornadoes, hurricanes, thunderstorms, and droughts. The graphics are developmentally appropriate for kindergarten students and only focus on weather conditions rather than the destruction that may occur. The checkpoint also contains a graphic of a cliff dwelling in Mesa Verde that is easy to understand and developmentally appropriate for students to apply their understanding of how the cliff dwelling was used to protect people from thunderstorms.
- End-of-Module Assessments and End-of-Spotlight Assessments use clear pictures and graphics that are developmentally appropriate. For example, the End-of-Module Assessment for Module 2 includes zoomed-in pictures of mule deer body parts for students to match the body part to the function of the body part. One photograph of a zoomed-in animal body part is a mule deer ear. In Module 3, End-of-Spotlight Assessment, there are three clear, colored images in the assessment that have a zoomed view so students can see the picture details. These pictures include a possum in the day and night, in addition to a photograph depicting the sun and moon on the horizon.

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 "Learn" section of the materials provides teacher guidance for consistent administration of the assessment. 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 11, the "Learn" section of the lesson supports teachers in preparing for and administering a Conceptual Checkpoint. The materials direct the teacher to show a webcam of Spruce Tree House, a Mesa Verde cliff dwelling. Teachers then display completed school and Mesa Verde weather recording sheets for students to view. As students begin the Conceptual Checkpoint part A, the materials direct the teacher to "return students' attention to the two weather recording sheets. Distribute a copy of the Conceptual Checkpoint (Lesson 11 Resource B) to each student. Direct students' attention to the

first question and read the question aloud. Ask students to use the information on the weather recording sheets to identify and circle the picture of the warmer place." The materials also prompt teachers with follow-up questions in a sidebar Spotlight on Knowledge and Skills note.

- 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. During daily formative assessments, the materials provide sidebar Differentiation Notes to support students who may need individual accommodations. For example, in Module 1, Lesson 5, students use a color-coded thermometer to analyze data and draw conclusions. A sidebar Differentiation Note states, "Students with color vision deficiencies, commonly known as color blindness, may need support during this activity. The National Science Teaching Association website provides resources to help students with color vision deficiencies."
- Materials offer accommodations for assessment tools so that students of all abilities can demonstrate mastery of learning goals. For example, the Conceptual Checkpoint in Module 2 assesses students on the Concept 1 Focus Question: "Why are plants able to live in some environments but not others?" The materials provide a Differentiation Note that suggests, "If students need support to meet the writing demands of this task, consider scribing their responses or conducting one-on-one interviews."

Great Minds PhD Science Texas Grade K

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. A Check for Understanding sidenote in Module 1, Lesson 24 on Weather, states, "Students use evidence from observations to explain how they chose to show how the shelter's structure changed because of severe weather. If students need support to explain how a severe weather event could affect their community, consider providing the following sentence frame: A [kind of severe weather] can be harmful because…."
- The materials include teacher guidance for scaffolding instruction and differentiating activities for students who still need to achieve mastery through multiple Conceptual Checkpoint opportunities. These checkpoints include the 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 27, students engage with a Conceptual Checkpoint that assesses student understanding of the focus question, "How does severe weather affect us?" Students review a severe weather chart and count how many times each kind of severe weather occurred to conclude which type of severe weather happened the most. In the "Teacher Support" component, the materials provide the next steps for students who have not shown mastery, stating, "If students need support identifying drought as the kind of severe weather that happened the most at Mesa Verde, revisit the Mesa Verde severe weather chart, and count with students the number of each kind of severe weather."
- The materials include teacher guidance for scaffolding instruction and differentiating activities for students who still need to achieve mastery. For example, in Module 3, Lesson 24, a "Differentiation" sidebar supports the teacher in scaffolding the activity. The sidebar states, "To help English learners and other students who may need support to connect parts to a whole

system, provide sentence frames such as the following, "...(part) and …(part) work together in a system."

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 3, Spotlight Lessons on Magnets, students extend their knowledge of magnets by arranging ceramic ring magnets on a pencil to make them appear to float when the pencil is held upright.
- The materials provide enrichment activities that account for learner variability. The materials include a Differentiation sidebar to offer challenging activities to students of all levels. For example, in Module 1, Lesson 15, "Some students may create a successful shelter on the first try. Consider providing these students with an extra challenge, such as designing and creating a second shelter from different material, expanding their current shelter to shade a larger area, or moving the wooden dolls outside the model shelter and creating an overhang to shade the archaeologists there."
- 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 5, the Extension sidebar guides the teacher to "Identify an area outside with different plants that are safe to touch and pick. Take students to the area, and invite student pairs to collect plant specimens. Then have students discuss similarities and differences in their specimens. Highlight the variety of plants that students found growing in their local environment."
- The materials provide enrichment activities for all levels of learners that account for learner variability. The materials within the teacher's edition provide teachers with sidebar notes for extension activities throughout the module. These extension activities apply to all levels of learners when appropriate. For example, in Module 1, Lesson 5, students engage with a thermometer and practice measuring the air temperature and the temperature of different water samples. The extension note states, "When students are familiar with how to use a thermometer safely and responsibly, consider setting up temperature exploration stations, where students can measure additional cups containing water at various temperatures."

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. In Module 1, Lesson 27, students engage with the focus question, "How does severe weather affect us?" Students review a severe weather chart to count how often each severe weather occurred. The materials provide a scaffold to support students in this task, stating, "...some students may benefit from a tactile aid for counting. Distribute math manipulatives, such as linking cubes, beads, or blocks. Have students count aloud as they place one manipulative on each shaded box to determine the total number of times each kind of severe weather occurred."
- 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 to provide scaffolded supports that teachers can implement during the lesson. In Module 2, Lesson 10, the Differentiation sidebar explains, "Some students may have difficulty

answering the question. Remind them of the investigation plan, and ask the following questions: What question did our investigation answer?" and, "Did our investigation tell us anything about desert fan palms?"

- The lessons include recommendations for just-in-time scaffolds to develop productive perseverance of learning in the moment through multiple Conceptual Checkpoint opportunities. In Module 3, Lesson 8, the Conceptual Checkpoint assesses student understanding of why we need light. The chart provided details of 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 indicate why glow worms are visible in a dark cave, materials suggest referring to the model from Lesson 5. The material also provides questions for the teacher, including, "Could you see an object inside the basement model if the object was blue? Could you see the object if it was slimy? Could you see the object if it gave off its own light?"

Great Minds PhD Science Texas Grade K

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. Materials incorporate ten collaborative conversation routines and techniques, seven written response routines, nine terminology learning routines, and four text-based routines. An example of a collaborative conversation routine and technique is the fishbowl routine. The materials explain, "The fishbowl routine allows students to model or practice behaviors such as asking thoughtful questions, listening attentively, and sharing ideas or tasks." In this routine, half the class sits in a circle (outside the fishbowl) while the other half of the class sits inside the circle (inside the fishbowl). Students inside the fishbowl engage in a collaborative task or discussion, while students outside observe. Then, all students debrief through discussion or writing.

- Materials engage students in the mastery of the content through a variety of developmentally appropriate instructional approaches. Lessons provide opportunities for student-led investigations, questioning, and discussions related to the student's course level. For example, in Module 2, Lessons 6-10, students plan an investigation about a bean plant, observe and collect data, analyze the data to make a claim, and provide evidence to support the claim.
- The program supports student discourse with authentic opportunities to engage in structured conversations and movement with multiple partners and as a whole group. For example, in Module 3, Lesson 22 students begin the lesson with a "Link-Up activity" that engages students in the concept of how light interacts with objects. 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. Terms included are, "illuminate, interact, light source, shadow and redirect."

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

- The materials consistently support flexible grouping and provide guidance to teachers on when to use specific grouping structures based on student needs. For example, in the Implementation Guide, PhD Science explains, "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." Clarification of student grouping within the materials states, "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 1, students gather materials to build a tent and work in collaborative groups with individual roles. Materials provide differentiation guidance for teachers like, "Kindergarten students may need support to work collaboratively in groups. Suggest students work together to solve problems. If needed, assign roles that encourage individual responsibility while ensuring that the group can successfully build a tent. Students may take on roles such as the following: ▪ Pointing out ways to improve the tent ▪ Keeping the group on task ▪ Pausing the group's work when a group member asks a question to ensure that the group listens and responds to the question ▪ Sharing the group's ideas with the class."
- The materials support a variety of instructional groupings. For example, in Module 3, Lesson 8, students work with a partner using the "Think-Pair-Share" strategy to discuss what they notice and wonder about the video of a cave entrance. The teacher displays photographs and videos and asks guiding questions to determine where the light is coming from. Students then work independently on the Conceptual Checkpoint. However, the Differentiation sidebar states, "If students need support with the writing demands of this task, consider scribing their responses or conducting one-on-one interviews."

Great Minds PhD Science Texas Grade K

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 such as 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 teacher guidance for the instructional routines embedded within lessons. For example, in Module 1, Lesson 2, the Teacher Note states, "Think-Pair-Share is a collaborative conversation routine that gives students time to think individually about a question before sharing with the class. All students should share their responses with a partner, but only a few students will share their responses with the class."
- The materials provide multiple opportunities for students to engage in varied types of practices within and across lessons. For example, in Module 1, Lesson 11, students engage in guided practice activities facilitated by the teacher. Students go outside and measure the current local weather, then record weather observations on a weather recording sheet. Upon returning to the classroom, students view a webcam at Mesa Verde and discuss questions related to the weather. Students complete the conceptual checkpoint questions independently, using their knowledge and observations of the weather. Afterward, students debrief the conceptual checkpoint in a collaborative discussion with a partner and compare and contrast their answers. Finally, the teacher guides a collaborative conversation around the anchor model of a cliff dwelling to determine whether the dwelling would protect people from the weather conditions.
- Materials state a clear purpose and learning goals for the group and independent practice activities contained in units and lessons. Lessons include opportunities for students to engage in collaborative learning while learning a new concept. For example, in Module 2, students engage in an instructional routine titled "Give One–Get One–Move On" to work with a partner and share key learning. When the teacher says, "give one," students swap ideas and "get one" from another student. The teacher then says, "move on," to indicate that students should circulate again to find a new partner and explain the idea to the new partner."

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 anchor phenomena used within the materials are curated to represent diverse communities from past and present-day society. For example, in Module 1, the anchoring phenomenon is the cliff dwellings at Mesa Verde. Throughout the module, students learn about the Ancestral Pueblo and how they build cliff dwellings to protect themselves from various weather conditions. Students are exposed to cultural elements of the Ancestral Pueblo people, including artwork depicting cliff dwellings, daily life, objects they made and used, and potential reasons why they left Mesa Verde.
- Materials represent diverse communities using images and information that are respectful and inclusive. The pictures and information on the Knowledge Deck Posters reflect diverse people and places. The Knowledge Deck Posters in Module 2 include photographs of a Native American man and girl gathering and using natural resources found in their environment. There are also photographs of the environment where Serrano and Cahuilla Native Americans lived. In the

Module 3 Knowledge Deck Posters, there is a photograph of people performing a traditional Wayang puppet show from Indonesia.

- Real-world examples and connections throughout the materials represent a diversity of communities and places, including rural, urban, and suburban communities, cities, and states across the U.S., and countries around the world. Depictions of places are respectful and inclusive, with an emphasis on community strengths, resources, and unique characteristics. For example, in Module 2, the phenomenon is the Mojave Desert. The Knowledge Deck for Module 2 provides information about how the Serrano and Cahuilla people used leaves from the Joshua trees to weave sandals.

Great Minds PhD Science Texas Grade K

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 1, the materials guide the teacher to explicitly introduce the term, *shelter,* using the following process: "Pronounce the term shelter and have students repeat it. Say shel-ter in syllables, and then repeat the full term. Provide a student-friendly explanation, such as 'A building is a kind of shelter. You can go into a building to stay dry when it is raining.' After introducing shelter and other important terms, provide scaffolds for English learners using the terms when speaking, writing, and investigating."
- The materials guide linguistic accommodations for Emergent Bilingual students, but the accommodations must be commensurate with the various levels of English language proficiency. For example, in Module 1, Lesson 9, the English Language Development note states, "To encourage participation, consider providing English learners with sentence frames such as "I feel warmest in…. I feel coolest in…." 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…."

Great Minds PhD Science Texas Grade K

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. For example, the Language Development side note in Lesson 4, Module 2, states, "Students will encounter the terms stem, trunk, leaf, and flower in this lesson set. Providing the Spanish cognates for trunk (tronco) and flower (flor) may be helpful. Ensure that students connect the vocabulary terms and the labeled drawing." 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.
- 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 K

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. 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 2 states,"Your student is learning how living things differ in separate areas of the Mojave Desert to understand why different environments have different plants and animals."

- 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 be doing 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 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 Overview 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 K, Module 1, some conversation starters include, "Talk about the weather. Compare local weather to weather in a location you have visited or want to visit. Point out ways people protect themselves from the weather. Discuss how weather influences daily life. Discuss how objects at home or in the community move because of pushes and pulls." Related activities to support student learning about the concepts of weather and magnets include, "Read or watch a weather forecast and plan an activity appropriate for the day's weather. Encourage your student to keep a weather journal using drawings, words, or photographs to record the weather. Have a scavenger hunt at home to find magnets (e.g., refrigerator magnets, can openers)."
- 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, in Module 2, Lesson 12, the optional homework asks students to "…find examples of healthy plants in their homes, yards, or neighborhoods. Students explain to someone at home what the plants need to be healthy." The homework assignment in Module 3, Lesson 2, asks students to "...identify light sources inside and outside their home."

Materials include information to guide teacher communications with caregivers.

- Materials include teacher guidance for communicating with caregivers. The Family 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 Family Tip Sheets are provided in English and Spanish. Materials include teacher guidance for communicating with caregivers. The materials 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.

Great Minds PhD Science Texas Grade K

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 also includes common topics within each module across grades. For example, Module 1 in grades K-2 includes lessons about the 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 comprises earth and space science, life science, and physical science, along with the TEKS aligned to each module.

Great Minds PhD Science Texas Grade K

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

- Materials include an introduction at the beginning of each module with information regarding anchor phenomenon, essential questions, ways to apply learning to new contexts, and recurring themes and concepts (RTCs). For example, the Module 1 introduction outlines the anchoring phenomenon of cliff dwellings at Mesa Verde to answer the question, “How did the cliff dwellings at Mesa Verde protect people from the weather?” Students complete an engineering challenge to create a shelter that provides shade and establish an enduring understanding of weather and its effects.
- Module 1, Lesson 1 Weather, clarifies the RTCs by stating, “throughout this module, students observe and describe the weather.” Materials formally define weather in Lessons 3 and 4 as “the combination of sunlight, clouds, wind, rain and snow, and temperature in a particular place at a particular time.”
- The Implementation Guide includes a horizontal and vertical alignment chart that outlines which scientific and engineering practices are included in each module or spotlight lesson.

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 that highlights 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 is used when the content standard is being taught for the first time. The “addressed” label is used each subsequent time the content standard is covered in a lesson. The “mastered” label is used when the content standard is being assessed for the final time and mastery is expected. For example, K.10A is an introduced standard in Level K Module 1, Lesson 8, and is later revisited as an addressed standard in Level K Module 2, Lesson 32. In Level K Module 2, Lesson 35, K.10A is labeled as a mastered standard.
- Materials provide a Curriculum Map that notes where the three major scientific components are sequenced in each module. For example, the Curriculum Map states, “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 3, Lesson 2, the Spotlight on Knowledge and Skills section states, “Students previously observed and recorded the properties of objects and materials on this chart, The Weather Module and Life Module.”
- Teacher materials include a Check for Understanding section to review knowledge and skills spiraled throughout the year, along with guiding questions to support students who need additional support with this concept.

Great Minds PhD Science Texas Grade K

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 Teacher Edition includes a Prepare section with a list of materials sorted by student and teacher materials. The section provides the teacher with a list of materials to prepare before the lesson and guidance for using the materials to provide instructional support during and after the lesson. For example, in Module 1, Lesson 2, the teacher guidance states, “Save questions recorded on sticky notes to add to the driving question board when it is developed in Lesson 3.”

Great Minds PhD Science Texas Grade K

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, ELA TEKS K.6B, "The student will provide an oral, pictorial, or written response to a text," is found in Module 1, Lesson 27, Module 2, Lesson 35, Module 3, Lesson 4, And Module 3, Spotlight Lesson 1.
- Materials include a Cross Area Connection section in the sidebar of Teacher Guide lessons. For example, in Module 2, Lesson 15, students analyze a graph showing days of rainfall within each month in *The Wonderland of Rocks.* The Mathematics Content Connection Note for teachers explains the standard and how students will "compare the number of rainy days that occurred in different months" and whether "the number of objects in one group is greater than, less than, or equal to the number of objects in another group."
- Cross-content standards are embedded throughout the materials, including twenty-nine Kindergarten ELAR TEKS, eleven Kindergarten math TEKS, and seventeen Kindergarten 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 List of all equipment and the quantity of supplies needed to support instructional activities in each module. For example, the spotlight lesson in Module 1 lists items needed to learn about magnets, such as one roll of aluminum foil, fifty-six resealable plastic bags, twenty-four binder rings, thirty bingo chips, twenty-five metal bottle caps, one calendar pocket chart, two cardboard sheets, two cardboard boxes, one clipboard, and twenty-four clothespins. Schools that purchase the Hands-On Materials Kit will receive all the items listed.
- Materials provide a comprehensive list of books in the Core Text Library. The Library includes texts to support instructional activities sorted by module and indicate if a Spanish translation is available. For example, *Blackout,* found in Module 3, includes a Spanish translation.

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

- The Implementation Guide includes a Safety in the Elementary Classroom section 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, in Module 3, the teacher guides students to "immediately inform teachers of any spills, breakages, or materials falling to the floor." Students must then follow all teacher instructions for cleaning up spills and breakages and handling other materials that may be dangerous.
- The Teacher Edition provides safety protocols to minimize potential hazards. For example, the Safety Note in Module 2, Lesson 13, reminds teachers to "...be aware of food allergies and latex allergies before cutting open the bell pepper, distributing bell pepper seeds to students, or distributing gloves to students."
- Materials provide safety considerations for teachers and students to implement. Module 2 guides teachers to explain all safety considerations to students and review 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."

Great Minds PhD Science Texas Grade K

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 2 suggests breaking the lesson up into two days.
- The Pacing Guide provides the maximum number of days that should be spent on each module to ensure all modules are completed within a school year that has 150 days of science instruction.
- The Pacing Guide provides a Year at a Glance with a recommended time frame for completion for each module. For example, Module 2 "...contains 36 lessons. Even with lesson splits and teacher choice days, this module should take no more than forty-nine days to complete. This maximum number of days ensures the implementation of all Level K."

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 to support the strategic implementation of concepts and skills to be taught in a specific order, building upon student learning in previous modules. For example, in Level K, Module 2, the materials guide the teacher to "Remind students of the drought conditions they explored in the weather module. Ask students to share how they think a drought would affect Joshua trees and desert fan palms differently."
- Materials provide guidance for strategic implementation that ensures the sequence of content is taught in an order consistent with the developmental progression of science found in 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 order. For example, in Module 1, students learn concepts and vocabulary about the weather before collecting weather data.

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

- Materials include a Pacing Guide that allows flexibility in completing a lesson set. For example, each lesson recommends seven to ten days to teach a lesson in its entirety. In Module 1, lessons 1 through 11 are scheduled to take eleven to eighteen days each, giving the teacher flexibility 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, the cross-curricular embedding of content, instructional notes that describe time-saving strategies, and alternative instructional routines.

Great Minds PhD Science Texas Grade K

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.

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 the overall design 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 notes 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 concepts of shade, weather, and building materials.
- 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 for Module 2, Lesson 6, the graphic for "water" is a water droplet and the graphic for "light" is a sun. The graphics are labeled, large in size, and are 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 materials include age-appropriate pictures and graphics that support student learning and engagement. Materials provide graphics and images for lessons in the Life Resources section of the Module 2, Life, Teacher Manual. 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 K

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, Lesson 22, students are assigned to a severe weather group. Each group watches a different video to gather information on one of the three kinds of severe weather. Materials include evidence of digital technology. For example, during the Module 3 Science Challenge (Lessons 16-19), students use a digital light meter to gather data on the amount of light transmitted through different materials.
- 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.

Great Minds PhD Science Texas Grade K

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 6, students view videos of a flag blowing in the wind and a flag blowing in the weak wind. Students use these videos to draw conclusions about how scientists find evidence of wind. In Lesson 10, students view videos of three homes in different parts of the world. Students view a video of a yurt, apartment building, and cave-dwelling, and observe each home closely to think about how it may protect people from the weather.
- 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 webcams and virtual tools to obtain information related to the phenomena and recurring themes. For example, in Module 1, Lesson 21, students take a Mesa Verde Balcony House virtual tour to determine how the rocks of the cliff dwelling protected people from daily temperature changes. A sidebar teacher note states, "The virtual tour takes viewers into Balcony House, a cliff dwelling at Mesa Verde National Park. Students can participate in the virtual tour by suggesting how to navigate the cliff dwelling. Consider having students provide oral directions, such as lookup or turn right, or having them point in the direction they want to explore next. Be sure to scroll through all 360 degrees of the tour as well as up and down."
- 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, in Module 3, Spotlight Lesson 2, students watch two video clips showing different times of the day. After the video, the teacher asks students to discuss the guiding question, "When do you think day becomes night?" with a partner using the "Think-Pair-Share" strategy. Students discuss what time of day they think the recording took place and support their answers with evidence.

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.

Great Minds PhD Science Texas Grade K

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.

Great Minds PhD Science Texas Grade K

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 12, students view a clip of the video titled, "Treasure Trove of Artifacts Discovered near This Colorado City." The video shows archaeologists working at a dig site in Colorado and teaches students that archaeologists are scientists who study people who lived long ago and the place where archaeologists dig for clues is called a dig site. In a sidebar Spotlight on Knowledge and Skills Note, the materials prompt the teacher to ask students to share examples of clues they think archaeologists may look for at Mesa Verde. The sidebar note aligns the video and activity to TEKS K.4B and K.4C, which require students to identify scientists and engineers and explore what different scientists and engineers do.
- 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 7, students watch a video about fireflies and discuss their observations. The video supports TEKS K.8A, as students "communicate the idea that objects can only be seen when a light source is present and compare the effects of different amounts of light on the appearance of objects."

Great Minds PhD Science Texas Grade K

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 the teacher needs to play specific videos 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 2, a sidebar Teacher Note states, "To help students understand the magnitude of Spruce Tree House, show the class the Street View of the location on Google Maps™ mapping service (http://phdsci.link/1471)."
- 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 a lighthouse using the provided link, "http://phdsci.link/1612." The teacher then asks questions to get students to identify key ideas. The materials also provide guidance to support the teacher with using the technology identified in the modules. For example, the Module 3, Lesson 17, Resource B document has a step-by-step guide for setting up a light meter before the lesson. The Resource B document includes written instructions and visuals to assist the teacher, as well as a chart to understand light meter readings and expected results to get with each material during the investigation.

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 guide parents and caretakers on concepts learned within the module. For example, in Module 1, the materials give additional resources and state, "Learn more about the cliff dwellings of the Ancestral Pueblo people and Mesa Verde National Park at https://www.nps.gov/meve/index.htm."
- 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 in Module 3, there is a link for families to learn more about the Sun, Moon, and stars on the NASA website, "https://spaceplace.nasa.gov/."