Great Minds PhD Science Grade 3

Great Minds PhD Science Grade 3 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 3	100%	100%	100%	100%
Grade 4	100%	100%	100%	100%
Grade 5	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 designed to engage and support student learning with the integration of digital technology.
- The digital technology or online components are developmentally and grade-level appropriate and provide support for learning.

Section 10. Additional Information

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

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Indicator 2.1

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

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

Meets | Score 4/4

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

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

Evidence includes but is not limited to:

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

- The materials provide multiple opportunities to develop grade-level appropriate scientific and engineering practices (SEPs), as outlined in the TEKS. To develop SEPs, students first make observations within lessons before they move into more complicated SEPs, such as planning and conducting a lab. For example, in Module 1, Lessons 1–2, students make and record observations of Surtsey Island via images, Google Earth, and reading materials. Students observe and record an outside local land area to compare and wonder about the differences between the local land and Surtsey. In Lessons 3–4, teachers divide students into groups to observe and record the properties of local land samples. Teachers use guiding questions to ask students to compare the similarities and differences of the land samples. Students use the observations to

develop an investigation about soil and then use data and information from the text to explain where the components of soil come from.

- Students practice using SEPs during investigations throughout modules. For example, in Module 1, Lesson 13, students analyze data to construct arguments (with teacher guidance) using evidence and a claim about wind and water changing the shape of Surtsey's land. Then students select a statement to explain how soil forms using the data they chose to collect and select the table that provides evidence to answer the investigation question about how soil forms on the shoreline of Surtsey.
- The materials provide multiple opportunities to show mastery of grade-level appropriate scientific and engineering practices. The modules increase the complexity of SEPs as the lessons progress. In the final lessons of each module, students engage in investigations with less teacher guidance before completing an Engineering Challenge. For example, in Module 1, Lessons 14–18, students complete an engineering design challenge to develop a shoreline protection system that could slow changes to the shoreline of Montauk Point.
- The materials outline how the students use SEPs to investigate grade-level appropriate content concepts with opportunities to repeat the practices throughout the year. For example, each module contains a specific SEP scope and sequence Science or Engineering Challenge. The challenge includes a set of lessons in which students apply their conceptual knowledge to solve a real-world problem through investigation or engineering design. For example, in Module 3, students complete an Engineering Challenge focusing on the Phenomenon Question: How can we use magnets to design a solution to help astronauts in space? Students design a toolbox that can be used to secure astronauts' tools when they are working in space outside the International Space Station. For example, in Pacing Guide: Module 3: Forces and Motion, Lesson 14, students evaluate a claim about the effect of multiple forces acting on an object. Students review and update a claim from Lesson 13.

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

- The materials identify overarching concepts using recurring themes and show how they connect within the materials and also provide multiple opportunities for students to use recurring themes in making connections between and within overarching concepts. Materials include Module Concept Statements that are a springboard for discussion about RTCs. For example, in Module 1, the statements are 1) Land has shape and is made up of rocks, soil, and sand; 2) Wind and water can shape the land by moving material from one place to another; and 3) Earth events change land over short and long periods. Materials direct teachers to ask students how each statement relates to systems and scale, and proportion. Teachers ask "What do you notice about the connections? Why do the connections between the Recurring Themes and Concepts and our module concept statements matter?" Students create a visual that links recurring themes and concepts as understandings to scientific ideas. Students can use the visual all year long to continue to connect grade-level concepts with RTCs.
- The scope and sequence includes specific information about when recurring themes are introduced and when they are spiraled back into the program. The Implementation Guide contains a chart indicating that Module 1 maintains the Earth and Space Science focus in grades 3, 4, and 5. In third-grade students, the anchoring phenomenon is the transformation of Surtsey. In fourth grade, students use the Grand Canyon features and patterns to anchor their learning. In fifth grade, students investigate the landscape of the Chihuahuan Desert. Patterns and Cause/Effect relationships occur in all grade levels K-5. The Pacing Guide contains a table that

shows how overarching concepts are included in Module 1 through Module 3, which shows how often students are given opportunities to make connections. In the final module, Module 3: Forces and Motion, students investigate and identify patterns to predict how far a car will move. Students identify and investigate cause-and-effect relationships to explain scientific phenomena and analyze problems in Module 3 when investigating an Atwood machine.

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 strategically (long-term goals) develop students' content knowledge and skills appropriate for the concept and grade level as outlined in the TEKS. The materials include an overview document that explains how the program is structured and builds on student knowledge across grade levels, modules, and lessons by tapping into students' curiosity about the world. The program presents content and concepts for students to make connections across units throughout the program.
- In Module 3: Forces and Motion, students study motion in space, the anchoring phenomenon, and build on content knowledge as they learn about each new concept. Students revisit and refine a model comparing the motion of a soccer ball on board the International Space Station with the motion of a soccer ball on Earth. At the end of the module, students use their knowledge of forces and motion to explain the anchoring phenomenon and apply these concepts in new contexts. Through the experiences, students begin to develop an understanding that forces can cause changes in the motion of objects.
- 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 Implementation Guide demonstrates the progression of TEKS in order of the progression of skills for grades 3–5, including a side-by-side comparison of concept lessons and phenomena. For example, Module 1 contains a module map that outlines the anchoring phenomenon and three key concepts of the module; each concept outlines the phenomenon, student learning outcome in the lessons, and content standards/SEPs/RTC/ELPS. The student learning provides a lesson progression to show how each lesson builds upon the prior lesson and links back to the anchoring phenomenon. The Module Map provides the application of concepts for the End-of-Module seminar, assessment, and debrief. The materials utilize a content learning cycle with five stages: wonder, organize, reveal, distill, and know.
- The materials support teachers in developing student content concepts and skills by providing resources and cues at varying points in lessons and units throughout the grade level. Materials contain a Teacher's Edition, Introduction, Background Knowledge, Prepare, and Teacher Notes that explain, describe, and make connections between the SEPs and the development of conceptual understanding. Content supports are provided to teachers through the Building Content Knowledge breakdown in the Teacher Guide. Each lesson contains support through ELD tips and teacher notes that explain how students use the materials and content area connections for reading, math, social studies, and art.

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 opportunities for students to ask questions and plan and conduct investigations. Materials provide regular opportunities for students to raise questions about

phenomena. Within the Earth Changes module, students generate questions about Surtsey and change to its land on a driving question board. Later in another lesson, students review the engineering design process and ask how they might develop a solution to slow changes to the land of Montauk Point and protect the lighthouse. Materials prompt teachers to ask students if they have any questions and to make note of their questions continually throughout the lesson.

- Students use scientific practices to plan and conduct simple descriptive investigations and use engineering practices to design solutions to problems. For example, students complete an engineering design challenge to develop, build, and test a solution for protecting the Montauk Point Lighthouse.
- 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 1, Lesson 2, students make a reading and language arts connection by using information and evidence from a text, “Life on Surtsey,” to build their understanding of the land formation and to draw what the text describes. In Lesson 1, students connect to math by using a timeline to support their understanding of timescales. Students also share their ideas for actions people could take to solve the problems they identified in the photographs of land changed by wind.
- The materials provide repeated opportunities for students to use grade-level appropriate scientific and engineering practices across various contexts throughout the course. Students complete design challenges and plan and carry out investigations within each module. For example, within an energy unit, students examine sound phenomena. The teacher explains that students will apply their knowledge of how land changes during an engineering challenge. They tell students they will watch a video about a lighthouse in Long Island, New York. As they watch, students look for a problem involving the lighthouse that needs to be solved. Using student responses, teachers then introduce the Phenomenon Question: How can we slow changes to the land of Montauk Point to protect the Montauk Point Lighthouse? Teachers review with students that the engineering design process is what engineers use to solve problems. Then they explain that students will review the engineering design process by learning about an inventor who had a problem to solve.

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Indicator 2.2

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

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

Meets | Score 4/4

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

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

Evidence includes but is not limited to:

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

- The materials use phenomena as a central anchor that drives student learning across grade-level content in each discipline (earth/space, life, physical science). Materials include an anchoring phenomenon that students refer to throughout the module. Supporting phenomena are used in investigations that relate to the anchor phenomena. Students share related phenomena that they experience through guided questions in the lessons. Assessments include phenomenon-driven assessments where students explain the phenomena and solve problems. Students examine phenomena using science and engineering practices (SEPs) through the lens of recurring themes. Students develop content knowledge as they work to construct explanations of the phenomena and/or solve engineering problems. The materials draw students back to the phenomena through anchor models and driving board questions. Throughout every lesson and activity, the focus is on understanding the phenomena driving the instruction.
- For example, third-grade materials begin with a Phenomenon question: What is happening to the island of Surtsey? Students make observations, ask questions, and construct explanations as they study more in-depth the composition of land by investigating solid pieces found at the earth's surface. Students describe the shape of the land by examining different photographs of landforms. Students take the information and describe Surtsey Island. Students further discover

the effect of water and wind on land by investigations. At the conclusion of the unit, materials draw students back to the overarching questions about the phenomenon.

- The materials embed thought-provoking phenomena and engineering problems that require nuanced and appropriate grade-level explanations. Materials provide opportunities for students to develop, evaluate, and revise their thinking as they figure out phenomena and define/solve problems. For grade 3, the students are asked: “How can we slow changes to the land of Montauk Point to protect the Montauk Point Lighthouse?” Students review the engineering design process and ask questions about how they might develop a solution to slow changes to the land of Montauk Point and protect the lighthouse. Students examine examples of shoreline protection systems and identify the natural and human-made resources that are part of each system. They determine that natural resources are used to make human-made objects and materials. Students test a variety of materials and examine their properties before building, testing, and improving their systems for preserving a model shoreline and preventing a lighthouse from falling into the ocean. Students use multiple materials in their solutions and explain their choices based on the materials’ properties. Students work to conserve natural resources by minimizing the amounts of materials they use in their systems. Students share their solutions with the class and evaluate the effectiveness of their designs.

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

- The materials provide opportunities to leverage students’ prior knowledge and experiences related to phenomena and engineering problems, ensuring that connections are made to previous science TEKS while allowing students to communicate their experiences outside of school. For example, each module is broken into lesson sets that build to support student content knowledge. In Module 1, the lesson starts with describing the land, then how the land can change, and last, how long changes to land take. These lessons build for the essential question, “How can the island of Surtsey change shape over time?” In Lesson 1 of the Spotlight Lessons on Changes in Matter, a Spotlight on Knowledge and Skills note is made for teachers. The note informs teachers that in the previous level, students learned about the term conserve. The note states that this lesson draws on this prior knowledge of reducing, reusing, and recycling to understand better conserving resources. Lesson 3 in the same section invites students to build on their prior knowledge of what causes objects to change shape as they investigate a glass recycling project.
- For example, in a lesson on earth changes, students draw on their experiences from previous levels as they describe changes to objects based on the observable properties of the objects by answering the question: “What are some ways in which objects such as pencils can change?” Pencils are a familiar experience for students, and they know how they can change.
- The materials allow for different entry points to the learning phenomena and/or solving problems. For example, in a grade 3 lesson, materials direct the teacher to take the class outside to a location where students can make observations of their local land area. Students record their observations by writing or drawing in their Science Logbook and then return to the classroom. Materials include a teacher's note suggesting the option that if it is not possible to take the class outside, students make observations through a window or they can provide students with photographs of the land around their school. If neither option is possible, teachers can introduce the Google Earth™ mapping service and zoom in on students’ locality.

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

- The materials clearly outline the scientific concepts and learning goals behind each phenomenon and engineering problem corresponding to content concepts across the grade level. The materials provide an Anchor Phenomenon with a corresponding Essential Question for each module. For example, Module 1 has the Anchor Phenomenon of "Transformation of Surtsey Island" and the Essential Question, "How can the island of Surtsey change shape over time?" For example, Module 2 has the Anchor Phenomenon "Butterfly Survival" and the Essential Question, "How do butterflies survive over time in a changing environment?" Module 3 has the Anchor Phenomenon, "Motion in Space," and the Essential Question, "Why do objects move differently in space than they do on Earth?" The materials break down each module into three concepts made of lessons that have their own focus questions and provide an answer for the teacher. Materials also provide the goal of answering the Essential Question through the Applications of Concepts, which includes an Engineer Challenge where students apply what they have learned as guided by the Anchor Phenomenon.
- The materials clearly outline the student learning goal(s) behind each phenomenon or engineering problem. For example, in grades 3–5, materials provide a "Building Content Knowledge" section that outlines overarching learning goals for each phenomenon or engineering problem addressed. Materials give a causal explanation of the phenomena or engineering problem. The explanation unpacks the meaning of the scientific idea so teachers can understand how to help students reconstruct the idea. The section also includes a breakdown of each Concept and Engineering Challenge. Module 2 Module Map lists the Anchor phenomena, concepts, and student learning or (goals) for each lesson. For example, in grade 3, a lesson on the properties of land presents students with the problem of how to describe the land. Materials clearly outline the lesson goal: "Observe photographs of different landforms to describe their shapes."

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Indicator 3.1

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

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

Meets | Score 6/6

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

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

Evidence includes but is not limited to:

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

- The materials connect new learning to previous and future learning within and across grade levels. The Implementation Guide provides Horizontal and Vertical Alignments tables for teachers to see how the TEKS, SEPs, and RTCs are structured horizontally and vertically throughout the materials. The tables give an overview of how grade-level modules connect within the grade levels and across grade levels through content standards, scientific and engineering practices, and recurring themes and concepts. For example, Level 3, Module 1: Earth Changes, includes the following horizontally aligned content strands: Matter and Its Properties and Earth & Space (10 &11). According to the Horizontal and Vertical Alignment table, Module 1 includes all the Science and Engineering Practices TEKS. The alignment for Module 1 also includes the following Recurring Themes and Concepts: patterns, cause/effect, scale/proportion/quantity, systems, and stability/change.
- Materials are vertically aligned and designed for students to build and connect their knowledge and skills within Grade 3 and various grade levels. For example, in Level 3, Module 2, Lesson 20, the sidebar note, “Spotlight on Knowledge and Skills” describes the vertical progression of students' knowledge related to the life cycle of an organism by mentioning what students learned in Level 1 and its alignment to Lesson 20. “In Level 1, students study a bullfrog life cycle model. Remind students that a life cycle is a repeating cycle as opposed to a linear process. As

necessary, support students who create a linear model by reminding students that adults produce offspring (3.13B, 2E).” In Module 2, Lesson 12, a Teacher Note is provided connecting the lesson about interconnected systems of multiple habitats will help the students when they learn the term *ecosystem* in Level 5.

- The materials present content in a way that builds complexity within and across units and grade levels. For example, Module 1 in third grade covers Earth Changes, where students learn that weathering is the breaking down of rock. Module 1 in fourth grade covers Earth Features, and students learn that weathering includes forces. Module 1 in fifth grade covers Earth Processes, where students learn that the force of weathering, erosion, and deposition create landforms.
- In the Level 2 Matter Module, students investigate how pushes and pulls change an object’s motion (2.7B). In Level 3, students build on their knowledge as they explore and describe forces that act on objects on Earth and in space, including gravity, magnetism, and pushes and pulls (3.7A). In the Forces and Motion Module, students learned that energy is necessary to make something happen. Students explored and identified examples of mechanical energy. In the current lessons, students build on their knowledge of energy by identifying other types of energy, including light, thermal, and sound (3.8A, 1A).
- The Teacher’s Guide provides a Spotlight on Knowledge and Skills throughout lessons to explain how a lesson activity develops students’ understanding of content, concepts, and practices throughout the year and across grade levels. For example, Module 1, Spotlight Lessons on Changes in Matter describes the vertical progression of students' knowledge related to properties of matter (3.6). Materials note to the teacher that students in Module 1, Level 2 learned the term *conserve* through the context of human impact (2.11B). In the current lessons, students draw on prior knowledge of reducing, reusing, and recycling to better understand the importance of conserving resources (3.11B, 1A) in level 2, and will continue to develop an understanding throughout the lessons.
- In Level 3, Module 2, Lesson 22, the sidebar note, Spotlight on Knowledge and Skills, describes how students build on their knowledge of an organism's survival strategies during seasonal changes by mentioning that what students learn in Lesson 22 will be a building block for what students will learn in lesson 23. It states, “Students focus on how animals other than butterflies survive seasonal changes in this lesson. In this lesson, students will observe deer, beetles, squirrels, and birds and discover how they respond to changes. Students will investigate how plants survive seasonal changes in the next lesson” by observing radish plants that have an annual life span.

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

- The materials include a progression of concrete and then representational before abstract reasoning when presenting concepts that allow for increasingly deeper conceptual understandings. Module 1, Appendix A, The Earth Changes Storyline offers a summary of the progression of concepts in the module, demonstrating that lessons move through a learning cycle. Lessons move through a learning cycle starting with observing a phenomenon and generating questions. Students develop an original explanation and create questions. Then students explore the question through investigation, which allows for a concrete experience. Students move to a representational understanding when they then apply evidence and reasoning to revise the explanation of the phenomenon. Students utilize abstract reasoning when they then apply knowledge to explain a different phenomenon. The End of Module Assessment concludes with a Socratic Seminar. Students discuss the essential question, “How

can the island of Surtsey change shape over time?" They use the products from the module as evidence for their explanation.

- The materials sequence instruction in a way that activates or builds prior knowledge before explicit teaching occurs that allows for increasingly deeper conceptual understanding. Materials provide a Building Content Knowledge section of the Module Overview to explain how students build their understanding of the nature of Earth's land with increasing depth throughout Module 1. Students explore the composition and shape of land, then explore the changing shape of the land and at the end of the module build on their understanding of how land changes through the engineering challenge. Students apply the engineering design process to develop a shoreline protection system that could slow changes to the shore of Montauk Point. Materials provide support to the teacher by explaining how to set up a class anchor chart to capture learning. The anchor chart is a class summary of foundational learning that students develop together throughout an entire module. The progression of updates to the anchor chart illustrates the increasing depth of students' understanding of science concepts throughout the module.
- In Level 3, Module 2, Lesson 1, students draw a picture of a butterfly and compare their picture to others' pictures. Then students draw another picture of the butterfly's environment. The materials use the student's prior knowledge of butterflies to introduce fossil formation and how they are formed on the earth. In Lesson 5 the anchor chart is created to capture students' initial understanding of survival and change. The teacher is invited to "Explain to students that they will begin an anchor chart to capture their learning throughout the module. Teachers work with students to record the knowledge they have gained about fossils." In Lesson 25, evidence of how students' understanding of survival and change has deepened throughout Module 2 is demonstrated with the final anchor chart update. The anchor chart update invites the teacher to "Summarize that changes to an environment may be caused by seasons, natural Earth events, and human actions. Update the anchor chart to reflect this understanding."

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

- The materials clearly present grade-level-specific core concepts, recurring themes and concepts, and science and engineering practices. Materials use the 7E (Elicit/Engage, Explore, Explain, Elaborate/Extend, Evaluate) instructional model for sequencing science instruction. The Engage/Elicit Phase captures students' interest in learning through activities such as teachers asking open ending questions activating learning and identifying problems. The Explore phases are separated into Organize and Reveal. In Organize, students represent the natural world by using models, constructing explanations, and proposing solutions. In Reveal, students plan and conduct investigations. During Explain, students represent the natural world using models, construct and evaluate explanations, propose solutions, and communicate the results. In Elaborate/Extend, students ask questions and identify problems, construct and evaluate explanations and propose solutions communicating results. In Evaluate, students reflect on their new science concepts and students evaluate the accuracy of student ideas and what they have learned.
- The materials accurately present core concepts, recurring themes and concepts, and science and engineering practices (SEPs). Across lessons, units, and grade levels, materials are free from scientific inaccuracies. Materials present scientific content that is current and reflects the most current and widely accepted explanations. For example, grade 3 materials introduce students to simple descriptions of the land, a solid material that covers the earth. Materials indicate that land has components of many materials. In Level 3, Module 1, Spotlight Lessons on Changes in

Matter, materials accurately explain the difference between single- and multi-stream recycling. Single-stream recycling involves all recyclable items remaining mixed until they are sorted at a recycling facility. In multi-stream recycling, recyclable items are sorted by their materials in recycling bins. Materials direct students to read their community recycling guidelines for more information about recycling. In Level 3, Module 2, the material provides accurate information that fossils provide evidence of many organisms that lived long ago and how their environments. Materials also explain the length of time needed to form fossils. In Module 3, Spotlight Lessons on the Solar System, the materials accurately explain the sun as a star closest to the Earth. It has thermal energy and is made up of gasses. It appears larger because of how close it is to the Earth.

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

- The materials include specific learning targets for each grade level. For example, materials provide a scope and sequence document that outlines when learning targets are introduced, developed, and mastered within the program. Each module has a module map to highlight specific skills addressed in each lesson. Learning targets highlight to support teacher facilitation.
- The materials clearly define the boundaries of content that students must master for the grade level. Materials that identify the objectives used are all TEKS from grade 3. The materials provide unit objectives for each unit and student learning objectives for each lesson. For example, in Level 3, Module 1, Teacher Note, students may use the term *mixture* to describe the drawer objects that are created using clear cups filled with crayon pieces, scrap paper, erasers, chenille stems, and metal paper clips. This term is not formally introduced until Level 4. Materials state that it is not an expectation that students use the term at this time.
- In Level 3, Module 3, Lesson 3, materials define the boundaries of outer space to the International Space Station. The materials explain in the Teacher Note that other factors in space including friction, gravity, and the air can affect a soccer ball being kicked. However, the purposes of the lesson only refer to the International Space Station. Level 3, Module 3, Lesson 5 students need to only be introduced to the term mechanical energy. The materials explain potential and kinetic to the teacher but instruct that the only term to be introduced is mechanical energy.

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Indicator 3.2

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

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

Meets | Score 6/6

The materials meet the criteria for the 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 include guiding documents that support teachers in understanding how new learning connects to previous and future learning across grade levels. The materials contain a scope and sequence that showcases which skills and standards students should have mastered in previous grades, and how learning will progress in the subsequent grades. Materials provide a Horizontal and Vertical Alignment chart separated by content standards, Scientific and Engineering Practices, and Recurring Themes and Concepts.
- Throughout each Module, the materials provide notes in the side-bars that support teachers in connecting students' learning. For example, the vertical alignment of knowledge related to conservation is described in Module 1, Lesson 1, in the sidebar note showing the teacher that in Level 2, students learned the term *conserve* through the context of human impact. In the current lessons, students draw on prior knowledge of reducing, reusing, and recycling to better understand the importance of conserving resources. In Module 3, Forces and Motion, Lesson 1, the Spotlight on Knowledge and Skills sidebar note describes how in the Level 2 Matter Module, students investigate how pushes and pulls change an object's motion (2.7B). In Level 3, students build on their knowledge as they explore and describe forces that act on objects on Earth and in space, including gravity, magnetism, and pushes and pulls (3.7A). The materials explain the

vertical alignment of Level 2 forces and Level 3 forces that act on Earth and in space. Level 3, Module 3, Forces and Motion, Lesson 8, Spotlight on Knowledge and Skills sidebar note describes how "students use the fair test guidelines as they build the skills necessary to conduct an experimental investigation. In this investigation, students gather evidence about how the release distance of the pendulum affects the distance the toy car travels. Students use a fair test to identify a causal relationship through the active manipulation and control of variables. Students will continue to develop these skills in Levels 4 and 5 (3.1B)."

- The materials include guiding documents that explain how content and concepts increase in depth and complexity across lessons and units within the grade level. A TEKS Content Development Progression chart also provides a vertical progression for teachers. Each module lists out the objectives being addressed and places in bold the parts of the content or entire contents that will be mastered in the module. For example, in 3.6A, students are introduced to the physical properties of matter in Module 1, but physical properties of matter are mastered in the Spotlight Lessons on Matter after Module 1. The Teacher Edition of the Modules includes Spotlight on Knowledge and Skills in the sidebars of the lessons explaining how the materials increase in complexity across the grade level. For example, in Module 1, Lesson 4, a Spotlight on Knowledge and Skills explains how in the second concept, "students explore how wind and water can change the shape of land," but in the current lesson students just need to know that "the tests represent possible interactions between rocks and other natural elements."

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 background information for teachers that provides explanations and examples of science concepts. Modules provide explanations of concepts for teachers in the Additional Reading For Teachers. Each module provides a list of other resources that can support the teacher's understanding such as websites and books being listed. For example, in Level 3, Module 1, the materials provide an Additional Reading for Teachers section and provide options for teachers to build knowledge. For example, materials provide teachers with the resource Nomination of Surtsey for the UNESCO World Heritage List from the UNESCO World Heritage Centre website.
- The materials identify common grade-level misconceptions students may have about science concepts. The Addressing Misconceptions section of the Implementation Guide describes how the curriculum guides teachers in addressing misconceptions. Module 1, Earth Changes, lists four common misconceptions. Next to the misconceptions in the chart are developed understandings. One common misconception is that soil is made up of only pieces of rock. The developed understanding states that soil is made up of pieces of rock and plant and animal remains. The Teacher Edition contains embedded instructional supports and sidebar notes with additional information for teachers that address misconceptions.
- For example, in Lesson 1 of Level 3, Module 1, in the Teacher Note, materials provide common misconceptions students may have describing solids. Students describe ice as a solid material. Students may categorize ice as land because both substances are solid. Very thick ice, such as glacial ice, is a type of rock; therefore, it is included as a solid part of land. Teachers need to explain that not all ice on Earth meets this criterion. For example, ice at the top of a pond in winter or a floating iceberg is not land. As needed, teachers provide students with relevant information. Module 1, Lesson 23, includes a Teacher Note explaining that an island growing is a

confusing phrase for students. The materials advise the teacher to listen for and address misconceptions as necessary to prevent students from thinking that the island is alive.
- The materials include supports for teachers to develop their own understanding of more advanced, grade-level concepts. Explanations and examples that support teacher subject knowledge of science concepts are evident in the Materials. For example, in Level 3, Module 2, Lesson 2, a Teacher Note intended to support teachers' understanding of geological time periods states, “This butterfly fossil was found in the Florissant Fossil Beds National Monument in Florissant, Colorado. The butterfly that formed this fossil was alive during the Eocene epoch, which was approximately 34 million years ago.”

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

- The materials provide a rationale for the instructional design of the program. In the Implementation Guide within the section Foundations, the materials provide a rationale designed to build knowledge coherently and engagingly. The materials offer students “deep conceptual knowledge and rigorous problem-solving experiences as they engage with new science content.” This “helps students apply knowledge to new situations and to see connections.” The Knowledge section of the Implementation Guide outlines how knowledge builds in the materials. In each module, 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.”
- The materials provide a framework explaining the main intent or goals of the program. Materials provide a Teacher’s Guide that thoroughly describes the program's instructional approaches and references the researched-based strategies present in each unit. Specific supports for each unit can be found in the Unit Overview for each unit. The Implementation Guide explains its foundation. “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.”
- In each module, students participate in investigations, discussions, and activities that build enduring scientific understanding and competence. Each module contains a storyline such as the Island of Surtsey for Level 3, Module 1. Students actively engage in a learning cycle of asking questions and sharing initial ideas about phenomena, investigating those questions, developing evidence-based explanations, and applying their knowledge to explain different phenomena in new contexts.

Great Minds PhD Science Grade 3

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 this 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 identify specific sensemaking behaviors of students. For example, materials identify sensemaking behaviors in the Introduction of the Implementation Guide. "Materials allow students to discover and understand the world in which they live, to solve problems, and to apply knowledge in different contexts. The PhD Science® Texas curriculum is designed to build knowledge in a coherent and engaging way. Students gain deep conceptual knowledge and rigorous problem-solving experiences as they engage with new science content. The curriculum's coherence helps students apply knowledge to new situations and to see connections among different contexts." Materials in the Implementation guide provide a table titled Research Says, Students Need, and PhD Science Responds. These two quotes come from the column titled PhD Science Responds: "Students are given opportunities to develop and drive investigations and to apply scientific processes in new contexts through Science Challenges or Engineering Challenges," and "Connections with other content areas in lessons signal

opportunities for students to practice grade-appropriate English language arts skills, mathematics skills, and skills from other content areas."

- The materials consistently provide learning activities that support students' meaningful sensemaking. For example, Lessons 10-11 of Module 1, Earth Changes, begins with students viewing the Sphinx from two different periods. Students observe that it is covered in sand. Students read *World Traveler: The Sphinx*. As they read, materials guide teachers to ask student pairs to identify one piece of evidence they think explains what happened to the Sphinx in the years between 1857 and the present day. From their responses, they build a "Phenomenon Question: How can wind affect land?"
- Students use their responses to build an investigation using models to see how wind affects land. For example, in Module 2, Lesson 2, students reflect on an activity in their Science Logbooks to analyze a butterfly fossil. In Module 3, Forces and Motion, Lesson 2, students explore a soccer ball's motion as they record what the soccer ball looks like before, during, and after a kick. Students engage in Think-Pair-Share to discuss the motion of the soccer ball after each interaction. Students use the Science Logbook, which contains built-in written response routines to guide their interpretation of the knowledge and concepts in the lesson. Students utilize Science Logbooks throughout every lesson to read and write like 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.

- The materials provide opportunities for students to engage in purposeful and targeted activities with grade-level appropriate scientific texts. For example, in Module 1, Lesson 2, teachers use the Google Earth™ mapping service to zoom in on Surtsey. Materials instruct teachers to discuss with students that an aerial view alone makes it difficult to see all the natural features of Surtsey's land, and they need to gather information from other resources to answer the "Phenomenon Question: What is happening to the island of Surtsey?" Students read *Life on Surtsey: Iceland's Upstart Island*. The teacher asks guiding questions before, during, and after reading to help students make sense of what they are reading. The students use this information to create a model in the log book to show their understanding of Surtsey. In Lesson 22 of Module 3, Forces and Motion, in the Teacher Edition, the teacher provides students with two texts: "Sideways Elevator" and "Sportswear with Zip." Students then work in pairs to read their assigned text and record information in their science Logbook.
- Students engage with scientific texts, including activities such as pre-reading and vocabulary, to help them develop an understanding of concepts. For example, materials provide pre-reading strategies in Lesson 2 of Module 1 in embedded support called Teacher Note. Materials instruct teachers to have students observe front and back covers to help students formulate ideas about the book's content before reading *Life on Surtsey: Iceland's Upstart Island (Burns 2017)*.
- Materials provide questions to ask students as they observe the text. For example, in Module 1, Lessons 1 and 2, students listen to a read-aloud from *Life on Surtsey* for them to create diagrams. Then, they listen to a different read-aloud, *An Island Grows,* to help them better understand how Surtsey formed.
- In Teacher Edition: Level 3, Module 3, Forces and Motion, in Lesson 22, the teacher reads *So Repulsive, It's Attractive!* and guides students to use both text and images to answer some questions: "What is the problem? How are magnets used to solve the problem? How does the solution affect people's lives?"
- The materials provide multiple opportunities for students to engage with scientific texts to gather evidence and develop an understanding of concepts. For example, in Module 1, Lesson

19, students obtain information about earth events that happen rapidly or slowly. Students are divided into groups to read a short text of 3-5 sentences about an event. Students find evidence from the text to share with the class about the timeline of the event and the effects it had on the land.

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

- The materials provide opportunities for students to communicate thinking on scientific concepts in written and graphic modes. For example, in Module 1, Lesson 1, students complete a notice and wonder chart about five images. In the Teacher Note in the sidebar, materials state that the chart will help students communicate their ideas. Students use models to support their understanding of science concepts. In Module 1, Lesson 2, students draw a model of the island of Surtsey. Throughout the first module, students return and add to this model as their understanding deepens.
- In Module 1, Lesson 5, materials instruct teachers to place the provided national parks and land posters in different locations around the classroom. Each poster shows pictures of land in a different national park or other protected area. Students participate in a Chalk Talk routine in which they move silently around the classroom and observe the land in the photographs on each poster. During the Chalk Talk routine, students view images or other groups' work and write comments and questions for others on chart paper. Students annotate and respond to each other's comments on the chart paper, engaging in a silent conversation.
- In Module 3, Lesson 2, after watching a video of astronauts kicking a soccer ball on board the International Space Station, students draw in their Science Logbook what the soccer ball looks like before, during, and after a kick. Students reflect on the "Phenomenon Question: How does motion in space compare with motion on Earth?" and develop a model in their Science Logbook that shows how the motion of a soccer ball on board the International Space Station differs from the motion of a soccer ball on Earth.

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 materials provide authentic student engagement and perseverance of concepts through productive struggle while acting as scientists and engineers. For example, in Module 3, Forces and Motion, Lesson 24, students apply the engineering design process to construct and refine a prototype to secure objects in space. Students use a given set of materials and consider how to design a solution to the problem. Groups work together to draw a detailed diagram of their selected design and record a list of needed materials. Teachers ask guiding questions as students work on their diagrams.
- The materials support students as "practitioners" while they are figuring out (sensemaking) and productively struggling. Materials prioritize students making evidence-based claims to construct explanations of how and why the phenomenon or problem occurs. For example, in Lesson 14 of Module 1, materials explain that students will apply their knowledge of how land changes during an engineering challenge. Students watch a video about a lighthouse on Long Island in New York. Students look for a problem involving the lighthouse that needs to be solved. In

Lesson 15, students apply the engineering design process to develop, build, and test a solution for protecting the Montauk Point Lighthouse.

- For example, in Module 3, Lesson 15, after watching a video on a golf ball rolling, the teacher shows the class the materials available for an investigation and explains that students will use the materials to plan and conduct their investigations. With a partner, students record an investigation question on a sticky note, use their investigation question, and investigate the force that causes a moving marble to slow down and stop. Materials provide questions for teachers to guide students through their investigation plan.
- The materials create t*ransfer* opportunities for students to take what they have learned and use it flexibly in new situations. For example, in Module 1, Lesson 6, students work in pairs to choose a claim and use their observations from the previous activity of observing photos of land before and after events as evidence to support that claim. Teachers ask each group to compare their observations of the three landforms that they previously analyzed. Students select the claim supported by evidence from their discussion and write observations to support their claim in their Science Logbook.
- For example, in Module 3, Lesson 5, students complete rotations of motion stations. After students have visited all six force stations, students discuss and analyze observations. Students work in pairs to sort and mark observations that describe motion similarly. The materials provide a sidebar Teacher Note that guides the teacher with questions to lead students in sorting motion into certain categories.

Great Minds PhD Science Grade 3

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 provide opportunities for students to develop how to use evidence to support their claims. For example, in Module 1, Lesson 11, students use wind models to investigate how wind picks up and moves land materials and causes land to change shape. Students record their observations in their Science Logbook and observe and compare their results with other groups by participating in a Gallery Walk. Teachers inform the students to use their observations, outlines, and the information from the Gallery Walk to support the claim that wind can change land.
- In Module 3, Forces and Motion, Lesson 12, materials provide an opportunity for students to develop a claim. In the lesson, students observe a demonstration that investigates how a force can change the motion of a moving object. Students use their observations to make a claim about what causes an object's motion to change. Materials guide the teacher to prompt students to work with a partner to make an initial claim in response to the Phenomenon Question: "What happens when multiple forces act on an object at the same time?" Materials explain that claims should be made using prior observations and experiences.
- The materials specifically prompt students to use evidence when supporting their claims. In Module 1, Lesson 4, students investigate how rocks change by breaking into smaller pieces.

Materials provide an investigation question of, "Do rocks change or stay the same?" The teacher explains to the student that they will collect evidence to construct an argument that answers the question. After the investigation, students share their thinking and the supporting evidence. The teacher encourages the class to use nonverbal signals to agree or disagree with the ideas as the teacher calls on students to justify their agreement or disagreement with evidence.

- In Module 3, Forces and Motion, Lesson 8, after reviewing team data from an investigation that students conducted, the teacher chooses one of the three release distances that the class tested. The students respond to the following prompt: "The release distance of the pendulum is 20 centimeters. Predict the motion of the pendulum and the car. Use evidence to support your response."
- In Module 2, Lesson 9, students gather evidence about claims through the practice of developing and using scientific models to collect evidence that supports a claim about the past environment of the Florissant area. Materials direct teachers to Invite students to work with a partner to draw conclusions about the past environment of the Florissant area based on the kinds of organisms that lived there. Students record their conclusions in the third column of the fossil evidence chart in their Science Logbook.
- According to the vertical progression of TEKS for Science, hypotheses are not formally introduced as part of the Knowledge and Skills until Grade 6 (6.1.H distinguish between scientific hypotheses, theories, and laws). To maintain alignment to the standards and ensure materials remain developmentally appropriate, PhD Science Texas does not formally introduce students to the term hypothesis in Grades K-5. However, students at these levels do engage in the thought-processes and articulation associated with formulating hypotheses as defined by the TEKS; "Hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence."

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

- The materials include opportunities to develop and use vocabulary *after* having a concrete or firsthand experience to which they can contextualize new terms. For example, in Module 1, Lesson 4, students learn about weathering. The teacher explains the definition of *weathering.* A teacher sidebar note is listed to instruct teachers to clarify the difference between *weathering* and *erosion*. Students explore how soil is formed by weathering when they investigate soil. In Module 1, Lesson 8, students build on their understanding of weathering by finding evidence for how sand forms.
- In Module 2, Lesson 23, students observe an image of a forest in the winter and a forest in the summer and discuss what in the environment is different in the winter compared with the summer. The teacher guides the conversation to discuss strategies that plants use to survive seasonal changes. Students observe differences between a plant that was in light and one that was in darkness. After the analysis of the plants, students discuss the differences and the teacher leads the students into a read-aloud of "Moss Mystery," where the teacher then explains the definition of dormant.
- In Module 3, Forces and Motion, Lesson 1, materials provide the opportunity for students to observe motion before the teacher focuses on the term and provides an explanation. The students watch a video of "Astronauts Kicking a Soccer Ball" and the teacher guides the students to focus on the movement or motion of the soccer ball. The teacher then explains the meaning of the term *motion*.
- In Module 3, Lessons 15-16, students have a concrete experience with the Phenomenon Question, "What causes a moving object to slow down and stop?" Students experience *friction*

in Lesson 15, and have the opportunity to develop the vocabulary in Lesson 16. Students are given the definition of friction in relation to the investigations of the marble slowing down from the previous investigation.

- The materials present scientific vocabulary using multiple representations. For example, in Module 1, a Key Terms list can be found on page 15. Materials state that students learn the terms through investigations, models, explanations, and class discussions. Materials introduce the term and definition of *decomposition* in Lesson 3. Students investigate soil and learn that plant and animal parts break down during *decomposition* and become part of the soil. Materials provide support for students who struggle with *decomposition* by showing students the soil column with plant material and providing a time-lapse video of plant material decomposing.
- In Module 2, Lesson 15, students complete a Frayer model with the word *suitable* as a class. In Lesson 16, students engage in a think-pair-share activity in which the word *suitable* and the definition of suitable will be embedded into the activity so that students may have meaningful conversations using the word in context. Students create two signs: one stating, “Not Suitable: Organism Perishes” and the other stating, “Suitable: Organism Survives Well.”
- The materials provide opportunities for students to apply scientific vocabulary within context. The focus phenomenon for Module 1 is the island of Surtsey. Students use the term *weathering* throughout the entire unit to explain how the Surtsey was formed. First students learn that land is made up of rocks, soil, and sand due to weathering. Then they learn that landforms have different shapes due to weathering. Students learn how wind and water can weather rocks and shape the land.
- In Level 3, Module 2, Lesson 15, students observe a picture and then engage in a Socratic seminar to deepen their understanding of the word *suitable*. Materials direct teachers to “use the Socratic Seminar routine, or a similar collaborative conversation routine, to discuss the following prompt. To prepare for the Socratic Seminar, have students sit in one large circle facing one another. Observe the photograph of the mountain environment. Which part of this environment is most suitable for each organism on our posters? Why?”
- In Module 3, Forces and Motion, Lesson 5, materials guide students to sort observations of the six motion stations students visited during the investigation. The students sort observations by using different symbols that describe motion similarly. The teacher then builds a tree map with students using their observations and then provides definitions for the terms direction, speed, and rest.

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

- The materials provide opportunities for students to develop how to engage in the practice of argumentation and discourse. For example, in Module 1, Lesson 4, the teacher brings the class back together, and refers to the investigation question: “Do rocks change or stay the same?” Students share their ideas and support their thinking with evidence from the rock tests. As students respond to discussion questions, teachers encourage the rest of the class to use nonverbal signals to indicate whether they agree or disagree with the ideas presented. Teachers call on students to justify their agreement or disagreement with evidence and summarize students’ findings by making the following class claim: Rocks can change. Students work in pairs to discuss their observations and pick two observations that provide evidence that rocks can change. Students record their observations in their Science Logbook and explain how each observation provides evidence that supports the claim. Teachers circulate to support students as they connect their observations to the supporting reasoning in their explanations.

- In Level 3, Module 2, Lesson 29, the curriculum supports student's development of content knowledge of Survival and Change during the Share stage of the engineering design process, students have the opportunity to tell others about their design solutions. Materials direct teachers to “gather the class for the presentations. Remind student groups that they will share their diagram and letter with one other group. Explain that each student group will review and discuss the other group’s solution. Tell students to listen carefully to the group’s presentation. Encourage students to ask questions during the presentation as outlined in the Science Logbook.”
- In Module 3, Forces and Motion, Lesson 7, the Spotlight Lesson materials provide a reflection process for students. The teacher highlights the class driving question board and prompts students to reflect on their new knowledge. Students participate in Think-Pair-Share about how they can explain a solar eclipse. Students take time to discuss their explanations.
- The materials integrate argumentation and discourse within stages of the learning cycle. Throughout Module 1, students work in groups to investigate and discuss observations. Students start with a phenomenon and share their observations with peers. Students then complete investigations and discuss evidence gathered with peers. Students make claims to answer questions while providing evidence to back their claims. In Lesson 8, students participate in an Inside-Outside routine to discuss students' observations. Students use this activity to summarize that water can cause land to move and change shape. For example, "In the Socratic Seminar at the end of each module, students synthesize their knowledge, discuss their ideas, and present evidence to support or refute claims. In Module 1, Lesson 23, students will explain how land changes over time in the Socratic Seminar using all the observations and evidence they have collected through the module.
- In Module 2, Lesson 25, during the Share stage of the engineering design process, students have the opportunity to tell others about their design solutions. Students work with a partner to compare the company’s ideas with their own and discuss whether the company’s ideas could be successful. Students record notes in their Science Logbook and share their ideas with the class by answering the following question: “Why do you think these ideas would be successful or unsuccessful in helping cardinals survive in the changed environment?”
- In Module 3, Lesson 28, materials provide the opportunity for student-led conversation. The teacher presents the following Essential Question for student discussion: “Why do objects move differently in space than on Earth?” Students discuss the question in the Socratic Seminar. Materials provide guidance for teachers, such as, “Students respond to each other directly, with minimal teacher facilitation. Students can remind one another of conversation norms, ask for evidence, and pose questions to extend the conversation.”

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 instruction for how to construct and present a verbal or written argument to problems using evidence acquired from learning experiences. For example, in Level 3, Module 1, Lesson 4, students use evidence to develop an argument that answers whether or not rocks change shape. Before constructing their argument students complete two investigations. Students share their ideas and support their thinking with evidence from the rock tests. Students use nonverbal signals to indicate whether they agree or disagree with the ideas presented. The teacher summarizes the evidence and writes the claim on the board. Students work in pairs to pick two observations to use as evidence.

Great Minds PhD Science Grade 3

- In Level 3, Module 2, Lesson 17, Students use their claims and evidence from their Science Logbook to help explain which other animals might live in groups. The instructions in the logbook guide the students to form a claim through the question, “Why do some animals live in groups? Make a claim.”
- 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. For example, in Module 1, Lesson 23, students complete a Socratic seminar. Teacher instructions for the Socratic seminar include: “Tell students they will share their understanding of the Essential Question with one another through a Socratic Seminar discussion. First, students write an initial response to the Essential Question: How can the island of Surtsey change shape over time? in their Science Logbook as a Quick Write. When students finish, ask them to draw a line below their responses. At the end of the seminar, students will revisit their responses to see how their thoughts have changed.” At the end of the seminar, students are allowed to change their answers to the essential question based on the class discussion.
- In Module 3, Lesson 14, materials provide the opportunity for students to use observations and student models of the balanced and unbalanced forces investigation to rewrite a claim. Students update and rewrite the class claim and list the evidence and reasoning that support the updated claim.
- 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 1, the Engineering Challenge Rubric, Lesson 14, Resource A has a measure for teachers to grade students' arguments and evidence. Students use evidence to select materials for their designs and explain how the properties of each material help slow waves from changing the land. Students discuss and explain how the parts of each group’s shoreline protection system use natural resources and work together to slow water’s changes to the land.
- In Module 1, Lesson 23, the Check for Understanding box provides directions for teachers to listen to correct evidence that supports the Essential Question. Materials provide a list of evidence that the teacher can check off as they listen to the Socratic seminar. If students miss some evidence there are tips for addressing the misconceptions.

Great Minds PhD Science Grade 3

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 teachers with possible student responses to questions and tasks. Materials provide questions within the lesson in bold text, and possible student responses in italic text. The materials also include teacher notes in the sidebar. In Module 1, Lesson 1, students are passing around a globe and pointing to an area they think shows land. A sidebar note reminds the teacher that in second grade, students described ice as a solid, so may categorize ice as land. This note anticipates possible student confusion and guides teachers to support student understanding of the concept.
- In Module 2, Lesson 3, during the task for the Check for Understanding, students collect data for the new clay fossil model and the teacher looks for students to record accurate measurements and descriptive observations. The Next Steps section instructs, "If groups of students need additional support measuring, pair them with groups that are having success. For groups that record minimal descriptive observations, ask follow-up questions such as these: What else do you notice about the clay fossil model? How is this clay fossil model different from the original one?"
- In Module 3, Lesson 1, materials introduce a book and list questions such as, "What do you think this book is about? Why do you think that?" Materials provide teacher guidance to read certain

pages of the book and then have students Think-Pair-Share and reflect on how it would feel to be an astronaut experiencing the event. Materials provide possible student responses: "The rocket launch would feel like going up on a roller coaster, but it would be a bumpier ride. There is no up or down! I think that would feel very confusing."

- The materials provide teacher responses to possible students' responses, including how to build on students' thinking. For example, the Implementation Guide: Supporting Scientific Discourse suggests using prompts during classroom discussion, and for students to use the sentence with their peers. The clarification sentence stems are: "What do you mean by…? Can you say more about that? What is your main point?" In Module 1, Lesson 3, students examine different soil types to determine what makes up soil. The materials prompt the teacher to ask, "How does this new information change your thinking about the components of land?" Materials provide three possible sample student responses. Then the materials guide the teacher to highlight student responses about remains of dead plants and animals being components of soil. Materials direct teachers to tell students that "dead plants and animals go through a process called decomposition. During decomposition, dead plants and animals break down and become part of the soil."
- In Module 2, Lesson 4, Check for Understanding, students discuss the Phenomenon Question, "What can we learn by studying fossils?" to make connections between their observations about the regional fossils and their region's past environment. Materials provide teachers with instructions on how to respond to students and build on students' thinking. Materials guide the teacher to tell students to consider what they know about present-day organisms that live in the ocean, and ask a follow-up question such as the following: "How can we use what we know about present-day marine organisms to help us understand our past environment?"
- The materials provide support for teachers to deepen student thinking through questioning. In each of the Modules, students participate in a Socratic Seminar to demonstrate their knowledge of the concepts. For example, in Module 1, Lesson 23, students participate in a Socratic Seminar with the guiding question, "How can the Island Of Surtsey change shape over time?" Teacher materials provide ten questions to spur additional conversation for students such as the following question: "In what ways has Surtsey changed over time? How did it change?"
- In Module 2, Lesson 5, materials provide students with photographs of Pedersen Glacier. Teachers ask students to Think-Pair-Share as they respond to questions provided by materials: "What is similar about the two photographs? What is different about the two photographs? Imagine that people were born in this location 100 years ago. If those people still live there today, how do you think they would describe how the environment has changed during their lifetime?"

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

- The materials provide embedded supports for the teacher in how to introduce and scaffold students' development of scientific vocabulary. In Module 1, Lesson 13, another sidebar note provides support for teachers to revisit the term *elevation* by introducing the word *elevator.* This scaffolding helps students determine the meaning of unknown words by using root words. The materials introduce vocabulary throughout the lessons. Materials include a section labeled Key Terms that lists the vocabulary learned throughout the Module. In Module 1, the key terms are listed and provided with the explanation, "In this module, students learn the following terms

through investigations, models, explanations, class discussions, and other experiences." When introducing the term *decomposition* in Module 1, Lesson 3, students list the different components of land after exploring different land samples. The lesson directs the teacher to highlight student responses about remains of dead plants and animals being components of soil, and that dead plants and animals go through a process called *decomposition*. During *decomposition*, dead plants and animals break down and become part of the soil.

- In Module 2, Lesson 1, students draw pictures of butterflies. The materials instruct teachers to tell students that their drawings represent part of a butterfly's *environment*, or the area surrounding an organism that includes what the organism needs to survive. Teachers explain that students' drawings include organisms that live around the butterfly and that these organisms provide some of what butterflies need.
- In Module 3, Lesson 1, materials embed vocabulary terms in bold for teacher focus. Materials embed a suggested vocabulary strategy for the teacher to include while studying *motion*, asking students to act out motion by moving throughout the room.
- The materials provide guidance for the teacher on how to support students' use of scientific vocabulary in context. For example, in Module 1, Lesson 23, students make a relationship map to show connections among key terms learned throughout the module. Materials provide the following directions for teachers: "Remind students that during the seminar they should incorporate science terminology learned during the module. Tell students they can refer to their relationship map from this lesson's Launch, the anchor chart, the anchor evidence organizer, and other classroom resources to support their discussion."
- In Module 2, Lesson 12, students make a chart representing plants' habitats. Students circle the second column on their chart and write the words plant habitat beneath it. Materials include, if time allows, to introduce the term *community*. A community is two or more groups of different kinds of organisms that live in the same area at the same time. Students can draw a circle around the headings Caterpillar and Plant and label the circle with the word *community*. *Habitat* and *environment* are similar words. Materials provide the teacher guidance that students mustn't use these words interchangeably. As students use these words in discussions, teachers continue to support them in using the correct terminology to describe a habitat or an environment.

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 supports to prepare for student discourse. The Implementation Guide provides explicit instructions on facilitating student discourse and support during a Socratic Seminar. It provides an overview of the activity and outlines student and teacher actions during the activity and outlines the teacher's effective uses of the Socratic Seminar.
- For example, in Module 1, Lesson 1, the teacher shows students pictures of the Island of Surtsey at different times, and the materials specify not to share that the pictures show the same area. Students are to make observations and share their observations with the class. Then students are to write questions that they want to be answered about Surtsey. This begins the claim-evidence process. Next, students hold a globe and are told to determine where areas of land and water are found on the globe. The materials provide questions to pose and sample student responses, such as "How did you decide which parts of the globe were land?" and the student responses, "You stand on land, but you can't stand on water, so I picked a place that wasn't water" and "I know where we live is land, so I picked a place that looked the same." In Module 2, Lesson 16 Check for Understanding, materials provide an activity to predict and explain their

chosen organism's suitability for an ocean environment. Teachers are provided with the question, "How did you evaluate your organism's ability to survive in this environment?" Several student responses are provided as well, as guidance to highlight any students' response that is unsure if the organisms would survive well or perish. Teachers confirm that some organisms fall in the middle because some organisms may not perish immediately, but would not survive well.

- Module 3, Lesson 5 materials provide a teacher sidebar note highlighting ways to support student group conversation while students sort observations. The Teacher Notes states, "Circulate to ensure that students sort observations related to speed and rest into separate categories. If students group these observations into a single category, consider asking questions such as these: What is similar about the observations that you marked with the same symbol? What do you notice about this observation that is different from the other observations that you marked with the same symbol?"
- The materials provide teacher questions for supporting student discourse and the use of evidence in constructing written and verbal claims. Each module contains a Socratic Seminar. During the Socratic Seminar, the materials guide the teacher to ask follow-up questions, bring out viewpoints, draw out specifics based on the concept, remain neutral, and have the students think for themselves and not just agree with the teacher. For example, in Module 3, Lesson 28, in the Socratic Seminar, students discuss the question, "Why do objects move differently in space than they do on Earth?" Materials provide four different questions teachers can ask midway through the seminar to continue the conversation such as, "How are the forces of magnetism and gravity similar? How are they different?" Teachers debrief with the class after the seminar by asking questions such as, "How well did we meet our goals? What worked? What didn't work as well?"
- The materials provide guidance that teachers can use to provide feedback to students while engaging in discourse. For example, in Module 1, Lesson 18, students share their solution to building a system that protects the model shoreline. After students share the material, students provide one piece of feedback on a sticky note for their peers. The teacher collects the feedback, reviews it, and then distributes the appropriate feedback for each group. The sidebar note guides student feedback by prompting them to use the questions in the science Logbook or to provide sentence starters such as, "I liked how you explained…." A Check for Understanding box provides the Next Steps if students need support to explain their ideas.
- The Implementation Guide provides question stems for teachers to use when supporting student discourse. For example, "Do you agree with…? Disagree with…? Did you change your mind, or are you sticking with your original answer? Have you heard an answer that is different from yours? Does anyone see this another way?"

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

- The materials provide teacher support and guidance to engage students' thinking in various modes of communication throughout the year. For example, in Module 1, Lesson 10, students plan an investigation to gather evidence about how wind and land interact. The lesson starts with students answering a question about a photograph of the Sphinx. Once students look at a current and older photo of the Sphinx and discuss what they observe, students then read a copy of *World Traveler: The Sphinx*. Materials include guiding questions for the teacher along with sample student responses to engage student thinking such as the teacher question, "What do you think might have caused so much sand to bury the Sphinx?" and the possible student responses, "People can move sand, but I don't think they would bury the Sphinx on purpose,"

"Water can change land, so maybe water brought the sand to the Sphinx," and "Maybe it was the wind! I've seen wind blow sand around on a windy day."

- Materials provide examples of exemplars of student-written responses. For example, Module 3, Lesson 1 materials guide the teacher to tell students they will watch the total solar eclipse over Spray, Oregon. Students draw what they see before, during, and after the solar eclipse in their Science Logbook. Materials provide options for students to express their ideas in writing. Teachers tell students to create simple drawings and add written captions or labels to elaborate on their observations.
- Materials also provide examples of student responses in the lesson. For Example, in Module 2, Lesson 20, students use their life cycle models to make observations during the next part of the activity. Teachers have students add labels to note life cycle stages or changes. The teacher circulates to help students sequence the cards correctly. As needed, teachers ask questions such as these to facilitate students' reasoning: "What do you think changed or happened between these two pictures? What do you think this organism looked like earlier in its life? What do you think this organism looked like later in its life?"
- The materials provide teacher support for facilitating the sharing of students' finding solutions. Materials provide feedback tips and examples teachers can use to support students throughout the learning cycle. For example, in Module 1, Lesson 9, students compare solutions to problems caused by water changing the shape of land. Materials include guiding questions and sample student responses to the questions. Students share ideas about how to stop landslides and discuss ways that people have tried to prevent landslides. A sidebar note for the student group activity has the groups leave one student at their poster to be the expert for the gallery walk; the other students in the groups will be information gatherers and bring information back. Throughout the lesson students are engaged in finding solutions, and discourse while the teacher is supported with guiding questions and student sample responses.
- In Module 2, Lesson 2, materials guide the teacher to work with students to create a class timeline. Materials guide teachers to ask students to share ideas from the timelines they created, and ask follow-up questions such as these to help guide student thinking: "Could your grandparents have been born before the earliest humans appeared on Earth? If butterflies need plants to live, do you think butterflies or plants came first? Place all the index cards except for the one representing the formation of the Florissant butterfly fossil." As students discuss the relative order of events, teachers help them to understand that the amount of space between events on the string used to create the timeline indicates the amount of time that passed between the events. After the class timeline is complete, the teacher asks students to write the events in the correct order in their Science Logbook. Materials provide possible student responses.
- In Module 3, Lesson 14, materials guide the teacher to ask students to work with a partner to develop a solution and to draw a force model on a piece of paper that explains how their solution works. Materials provide a sidebar Teacher Note that explains how to promote student communication and suggests the teacher use a Mix and Mingle routine to allow partners to share and discuss their force models with other students.

Great Minds PhD Science Grade 3

Indicator 6.1

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

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- Materials include benchmark assessments administered mid-year and at the end of the year. Level 3, Benchmark 1, should be administered after the Survival and Change module, and Benchmark 2 should be administered after the Spotlight Lessons on the Solar System. The Benchmark assessment is optional and provides additional opportunities for evaluating students' understanding of content and their mastery of scientific and engineering practices and recurring themes and concepts. While benchmarks assess comprehensively, benchmark data tools only provide a general rubric rather than data pinpointing students' strengths and areas of needed growth.
- Materials include formative assessments in various formats to measure student learning and determine the next steps for instruction. Materials have Conceptual Checkpoints throughout the modules. In Module 1, Lesson 7, students complete a Conceptual Checkpoint in which they apply their learning about the composition and shape of land to the island of Surtsey. In Module 1, Lesson 13, students apply their understanding of wind and water changing land to the island of Surtsey in a Conceptual Checkpoint. Students complete an Engineering Challenge in Module 1, Lessons 14-18, that requires them to apply what they have learned to develop, build, and test a solution for protecting the Montauk Point Lighthouse. Students model the shoreline and design a way to protect their model shoreline. For example, in Module 2, Lesson 18, students

participate in a Conceptual Checkpoint to apply their understanding of how organisms' characteristics allow organisms to survive in their environment. Teachers play the video of elephants in their habitat twice with a short pause between viewings for students to jot down what they notice on a blank page of their Science Logbook. After the second viewing, teachers distribute a copy of the Conceptual Checkpoint to each student and ask students to talk with a partner about what they observe in the elephant diagram, in the labeled photograph, and in the video. After students discuss their ideas with a partner, they work on the Conceptual Checkpoint independently. Students use the video and the pictures to answer the questions

- Materials include summative assessments in a variety of formats. Materials provide an End-of-Module Assessment and a Socratic Seminar in every module. For example, in Module 1, Lesson 32, students complete a Socratic Seminar. Students use what they have learned to engage in discourse with their peers to answer the question, "How can the island of Surtsey change shape over time?" Students complete an End-of-Module assessment independently that involves writing observations between two images showing a river before and after a flood; students choose matching claims for the images, label a diagram after reading a brief for a flood protection system, and then students order the process of weathering, erosion, and deposition. In Level 3, Module 2, Lesson 31, materials provide an End-of-Module Assessment for students to show all the knowledge they have developed through their study of how organisms survive over time in changing environments.
- Materials include a variety of informal assessments that give teachers feedback on student learning in the moment so that they can modify instructional approaches. For example, Module 3, Lesson 1 materials include the opportunity for the teacher to check for student understanding. Materials include a formative assessment where students share what they notice and wonder about the motion of the soccer ball in the video viewed during the lesson. Materials guide the teacher as to what TEKS are assessed in the Check for Understanding, the evidence to look for, and the next steps to take. The materials guide the teacher to have students record accurate observations about the motion of the soccer ball in space and ask questions about why objects move differently in space than they do on Earth. The Next Steps include revisiting the video reminding students to focus on the motion of the soccer ball, and asking questions such as, "What surprises you about the motion of the soccer ball?"

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. Materials display the TEKS for each question in the Alignment Map provided for each End-of-Module Assessment, Engineering Challenge, and Benchmark. For example, Benchmark 1 includes an alignment map that lists the TEKS (Texas Essential Knowledge and Skills) assessed by each item in the Benchmark. Item 1, Integration of Standards, includes Content Standard 3.10B, Investigate and explain how soils such as sand and clay are formed by weathering of rock and by decomposition of plant and animal remains; SEP 3.1B, Use scientific practices to plan and conduct descriptive investigations and use engineering practices to design solutions to problems; and RTC 3.5E, Investigate the flow of energy and cycling of matter through systems. The End-of-Module Alignment Map shows the Content Standards, Scientific and Engineering Practices, and Recurring Themes and Concepts connected with each item. Question 1b assesses standard 3.10C, SEP 3.3A, and RTC 3.5G.
- The materials indicate which student expectations are assessed. For example, Module 3, Forces and Motion, End-of-Module Assessment Rubric includes a list of the TEKS assessed in the End-

of-Module Assessment. Materials include an End-of-Module Assessment Alignment Map for teacher reference, which lists the TEKS assessed by each item in the End-of-Module Assessment.

- Materials contain a Lesson Overview showing the End-of-Module Socratic Seminar, Assessment, and Debrief. The Lesson Overview includes the student learning expectations, TESK covered, and ELPS. The materials indicate which student expectations are assessed in the summative benchmark at the end of Module 1. The benchmark rubric contains a table that shows what student expectation is linked to each question number. It includes an answer key. In the answer key, there is a correct answer shown, and for each incorrect answer, it explains why it is wrong. Materials contain a Benchmark Alignment Map that shows the question number/item, Integration of Standards, Content Standards, Scientific and Engineering Practices, and Recurring Themes and Concepts.

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

- 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. Each module contains a Socratic Seminar where students engage in scientific discussion. For example, in Module 3, Lesson 28, students engage in the Socratic Seminar to demonstrate an understanding of patterns used to predict motion. Each module also contains an Engineering or Science Challenge where students must integrate scientific knowledge and science and engineering practices. For example, in the Module 1 Engineering Challenge, students apply the engineering design process to develop, build, and test a solution for protecting the Montauk Point Lighthouse. The Standards Addressed provides 13 different SEPs that are covered through the lessons and three RTCs that are addressed throughout the Engineering Challenge.
- For example, in Module 3, Forces and Motion, Lessons 23-27, students apply their understanding of the properties of magnets to solve a problem in an Engineering Challenge. Students begin by defining a problem encountered by astronauts in space outside the International Space Station. Students then use their understanding of magnetic force to develop a solution to the problem. Students use the engineering design process throughout the lessons to identify cause-and-effect relationships and improve their solutions.

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. For example, students complete an engineering challenge that requires them to use the knowledge that they gained from the previous lessons about how land changes to develop a shoreline protection system that could slow changes to the shoreline of Montauk Point and prevent the Montauk Point Lighthouse from falling into the ocean.
- In Teacher Edition: Level 3, Module 3, Forces and Motion, materials allow students to complete an engineering challenge. In Lesson 23, students use the engineering design process to design a toolbox that can be used to secure astronauts' tools when they are working in space outside the International Space Station. Materials guide students to focus on the Phenomenon Question, "How can we use magnets to design a solution to help astronauts in space?"

Great Minds PhD Science Grade 3

- In Module 1, End of Module Assessment, the first question has students observe drawings of a location before and after a flood. Students first write two observations, then circle two different claims that match the evidence provided by the drawing. In the Module 2 End of Module Assessment, a multipart question provides a data chart containing weather conditions for Amarillo and Tampa. Students use the table to compare, choose the best claim about orchids from the three choices, provide evidence, and find an answer to why orchid fossils could be found elsewhere.

Great Minds PhD Science Grade 3

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 this indicator. Materials include 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 information that guides teachers in evaluating student responses. Materials include follow-up suggestions for formative assessments in the Teacher's Guide, provide examples of acceptable answers for evaluating student responses, and include suggested teacher actions to address student learning gaps in lessons and units. Materials guide teachers to look for specific components when evaluating student responses. For example, in Module 1, Lesson 2, the Check for Student Understanding is used as a pre-assessment. Materials state, "Use students' responses to gauge their prior and developing knowledge of how models can be used to describe patterns of change in the natural world." This Check for Understanding provides evidence that students should share, such as "labels that identify land and water; drawings or annotations of Surtsey's natural features, such as hills or flat areas; identification of rocks as a part of the land; and indications that the island has undergone change." If students do not meet the guided evidence, the box provides a section for Next Steps. "If students include explanations that they do not support with evidence, review with students how they selected evidence to include in a scientific model they developed in the past." A Teacher Side Note in the sidebar states, "For more information on how to develop the anchor model, see the Anchor Visuals section of the Implementation Guide."

- An embedded Teacher Note at the end of the module assessment lesson suggests guidance for providing feedback to students and preparing for student reflections in the next lesson. During the lesson following the assessment, teachers are guided to support students in debriefing the assessment and reflecting on their module learning. Each assessment item contains a sample student response. Additionally, the End-of-Module Assessment rubric describes evidence of student work that meets expectations. These rubrics can be shared with caregivers to communicate student progress. For example, in Module 2, Survival and Change, End-of-Module Assessment Rubric Directions: Score each student's End-of-Module Assessment, the rubric describes evidence of student work that meets expectations. Teachers use the blank spaces as needed to record evidence of student work that exceeds or falls below expectations.
- Materials include resources that guide teachers in evaluating student responses. The implementation guide and the Teacher Edition Module contents include the Rubric for students' use, and the End of Materials includes resources that guide teachers in evaluating student responses. Each module has one Engineering or Science Challenge with an accompanying rubric. Each module has one End-of-Module Assessment and accompanying rubric. Each Benchmark includes a rubric and an alignment map. The alignment map includes details on the standards addressed for each item. For example, the materials provide an End-of-Module assessment that requires students to answer with short, constructed responses. A rubric provides support to teachers in evaluating student answers. The rubric describes evidence of student work that meets expectations. Teachers print the rubric and fill out blanks while evaluating. In Module 1, Earth Changes, End-of-Module Assessment, question 1, students look at a river before and after a flood. Students must write their observations of each image. The rubric states, "The student observes drawings of a riverbank before and during a flash flood (3.1E) to describe the shape of the land and components that make up the land in each picture (3.10C)." Module 1 contains an Engineering Challenge spread through Lessons 14-18. In the lessons, sample student responses support the teacher throughout the process. The rubric states, "Score each student's engagement in the Engineering Challenge. The rubric describes evidence of student engagement that meets expectations for each stage of the engineering design process. Use the blank spaces as needed in the rubric to record evidence of student work that exceeds or falls below expectations."

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 documents and resources to support teachers' analysis of assessment data. For example, two Benchmarks are provided. Guidance on when to administer the Benchmarks is found in the Implementation Guide. Materials provide a rubric, answer key and an alignment map. The alignment map includes details on the standards addressed for each item. Materials provide suggested steps for teachers to follow or questions for teachers to ask themselves when interpreting student data in the Implementation Guide. Materials also provide questions to ask students.
- Materials provide guidance documents and resources to support the teacher's interpretation of the data. Materials include Evidence and the Next Steps for teachers after completing the informal Check for Understanding and formative Conceptual Checkpoints. In Module 3, Lesson 28, materials instruct teachers to listen for evidence that students comprehend the TEKS learned throughout the module, such as patterns that can be used to predict motion. Students respond to evidence provided by peers during each question in the Socratic Seminar (3.3C).

Materials give the next steps of what to do to help students. If students express misconceptions during the Socratic Seminar, teachers meet with them individually or in a small group before the End-of-Module Assessment to provide additional hands-on investigations of phenomena related to their misunderstanding and help students use precise language to construct explanations of those phenomena. Materials provide suggestions for examining patterns or trends in the data that help teachers better understand student performance in the Implementation Guide.

- Materials provide guidance and tools to support teachers in responding to data to inform instruction. The formative assessments and informal assessments in the modules provide additional support for teachers, such as the Next Steps in the Conceptual Checkpoints and Checks for Understanding. Materials provide rubrics for each student for Benchmarks and the End-of-Module Assessments. The individual student rubrics have the teacher score the student's assessment based on each item, providing a rating scale of 1-4. A score of 1: Does Not Yet Meet Expectation, indicates an incorrect or unreasonable response with no detail or evidence. A score of 2: Approaches Expectation indicates an incorrect or unreasonable response with some detail or evidence OR a correct or reasonable response with insufficient detail or evidence. A score of 3, Meets Expectations, indicates a correct or reasonable response with sufficient detail or evidence. A score of 4, Exceeds Expectations, indicates a correct or reasonable response with more than sufficient detail or evidence.
- Materials include assessment tools that yield data teachers can easily analyze and interpret. The Implementation Guide supports teachers in data analysis and identifying patterns and trends in data. Materials include scoring guidance for assessments, individual student score sheets, class trackers for item performance, standard performance, module performance, and next steps with data. These tools help teachers track student and class progress toward skill mastery. Guiding questions are included with each section to aid in teacher analysis of patterns and trends in student data. The assessment tools result in data reports that inform instruction and facilitate tracking of student progress toward skill mastery. For example, the End-of-Module Assessment provides sample answers for the teacher. Materials also provide a rubric to use while grading the assessment. The rubric includes item numbers, TEKS assessed for each question, and the meets description. Materials provide answer keys and rubrics and explain how to interpret the data. The materials instruct teachers to prepare for the next lesson and review End-of-Module Assessment responses to provide rubric scores and actionable feedback to students on a separate page from the assessment. The materials provide Assessment trackers to categorize students by skill mastery and suggest instructional groupings, including reteaching and extension in the Implementation Guide, providing Next Steps after Assessments.

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

- The information gathered from the assessment tools helps teachers when planning core science instruction. Materials provide Next Steps during the informal assessments of Checks for Understanding and the formative assessments of Conceptual Checkpoints. The ongoing assessments throughout the lessons help inform teachers of students' learning. For example, in Module 1, Lesson 1, Check for Understanding, students make observations of what they notice and what they wonder from photographs of Surtsey. The Next Steps provide a note for the teacher to offer students additional support, if needed, by directing students to focus on two images at a time and observe similarities and differences. The next Check for Understanding is in Lesson 2, where students model information, and then in Lesson 3, where students practice using evidence to explain how soil is made. These mini-assessments support teachers in

identifying which students are struggling before they get to Module 1, Lesson 7, for the Conceptual Checkpoint.

- In the Conceptual Checkpoint, students have to create observations of a diagram and provide evidence about how the diagram supports their answer of agreeing or disagreeing with the provided claim. In the second part of the Conceptual Checkpoint, students order the steps to how soil is made. Each part of the Conceptual Checkpoint was practiced in an earlier part of the Concept, allowing teachers to utilize the Check for Understanding to support students' mastery of the Conceptual Checkpoints.
- In Level 3, Module 2, Lesson 11, Conceptual Checkpoint materials provide the Next Steps for teachers to help plan core instruction. For example, "If students need support to compare the weather conditions, have students annotate the bar graph by writing the numerical values for each bar. Ask guiding questions such as these: How does the temperature in Eureka compare with the temperature in Florissant? How does the precipitation compare? If students need support to identify that the weather conditions are different in the two locations, revisit the graphs and ask questions such as these: How do the heights of the bars compare? What does that tell you about the weather conditions in the two locations?"
- Materials offer support in the Next Steps provided in the Conceptual Checkpoints and Checks for Understanding, but not for the End-of-Modules or the Benchmarks, for example, in Module 2, Lesson 18, Conceptual Checkpoint, Next Steps materials direct teachers to support students that did not master the evidence of identifying and explaining elephant characteristics to help elephants survive in their environment. Materials instruct teachers to consider rereading *Amos & Boris* (Steig 2009). Teachers ask students questions such as the following: "What characteristics allow Amos the mouse to survive in its environment? What characteristics allow Boris the whale to survive in its environment?" If students need support predicting how changes in the food chain affect the other organisms, teachers are directed to refer to the scenarios from Lesson 13. Teachers then have students work in small groups to review each scenario and explain how removing all of one type of organism affected the other organisms in the food chain. The Benchmark provides an individual student rubric and an alignment map but no further teacher guidance. Materials provide multiple data trackers that allow the teacher to sort students into groups to best support students.

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. Materials provide a variety of activities that a teacher can implement, and the materials contain student resources to be used in response to data. The Implementation Guide contains a section titled "Implementation and Instructional Resources" that provides additional activities for students to review and practice. Additionally, each lesson has a Check for Understanding box. If students struggle to answer the Check for Understanding, the materials provide suggestions for the next step to support student learning. Sidebar Teacher Notes also offer suggestions and tips for teachers if students are struggling with the material. Optional homework is provided for each lesson that the teachers can use in any manner they see fit. The Next Steps describe how teachers can respond to student data by providing questions to focus student responses. For example, in Module 2, Lesson 1, the purple Check for Understanding box includes a Next Steps section that guides teachers by stating, "It is not necessary for students to fully identify or understand all the components of a butterfly's

environment at this point. If students need support identifying any key components of a butterfly's environment, consider displaying photographs of butterflies in their environment."

- Materials provide a variety of teacher guidance for responding to student data. Materials provide guidance in the informal assessments of Checks for Understanding and the formative assessments of Conceptual Checkpoints. The Materials provide Next Steps for the End-of-Module Assessments, End-of-Spotlight Assessments, and Benchmarks, and are listed by module. For example, in Level 3, Module 3, Solar System, Spotlight Lesson 2, students complete a Check for Understanding in which they measure the temperature of a thermometer on the ground in the sun, under a shadow, and on the ground after the shade is moved. If students do not demonstrate mastery in the activity, Next Steps suggests the teacher display a thermometer and model how to read the temperature in degrees Celsius, then provide student pairs with two or three samples (e.g., water, ice, air) and have them measure and record the temperature of the samples. The End-of-Module Assessment for Level 3, Module 1, Earth Changes, offers the Next Steps of "Review Lesson 12 materials with students to support them with explaining solutions to prevent changes in Earth's surface" if students did not get question 3 correct.
- In Module 3, Lesson 28, students engage in a Socratic Seminar, and materials provide a Next Steps guide. In the Next Steps section, materials guide the teacher by stating, "If students express misconceptions about forces and motion, meet with them individually or in a small group before the End-of-Module Assessment. Provide additional hands-on investigations of phenomena related to their misunderstanding, and help students use precise language to construct explanations of those phenomena."
- Module 3, Lesson 30 materials guide the teacher in planning instruction after students complete an End-of-Module Assessment. Materials suggest students reflect on their responses, recording their self-assessment feedback on their copy of the assessment rubric. Materials guide the teacher to distribute written teacher feedback on students' End-of-Module Assessments. Students review feedback from their responses independently and write questions they want to discuss with the class. The teacher then shares with students samples that meet expectations and conducts a class discussion of the assessment.

Great Minds PhD Science Grade 3

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. For example, the End-of-Module Assessment for Module 1 contains questions about changes to the land before and after a flood and asks for students to design a flood protection system from a list of materials and a model. Both are accurate scientifically and for the grade level to be assessed. In Level 3, Module 2, Lesson 11, the Conceptual Checkpoint contains items about fossils and environmental conditions that are scientifically accurate. The information could be considered scientifically correct as the materials cite the reference scientific source of the information. In the Teacher Edition: Level 3, Module 3, Forces and Motion, End-of-Spotlight Assessment, question 1B states, "Circle two claims that explain why gas is matter." The correct answer choices accurately state that gas is matter because it has mass, and gas is matter because it has volume.
- Assessments contain items for the grade level or course that avoid bias. Formative and summative assessments include items that present content and examples fairly and impartially with no impact on student performance based on such factors as a student's home language, place of origin, gender, or race and ethnicity. For example, Benchmark Assessment 1 provides images of Mount St. Helens and a landslide near Big Sur in California that are from two diverse locations. In Module 3, Forces and Motion, Lesson 18, a Conceptual Checkpoint assessment includes a girls' volleyball game video and a boy hitting the ball underhanded. Students use this information to answer questions at the checkpoint.
- Assessments contain items for the grade level or course that are free from errors. For example, the End-of-Module Assessment contains items for the grade level and course that are free from

errors. In Module 2, Lesson 18, the Conceptual Checkpoint contains items about how organisms' characteristics allow organisms to survive in their environment. The information could be considered scientifically correct as the materials cite the referenced scientific source of the information. The assessment also does not contain errors. Benchmark 2, Level 3 materials include question number fourteen, which asks students to show the planets in order. This question item assesses Lesson 5 from Teacher Edition: Level 3, Module 3, Spotlight Lessons on the Solar System, in which the students use planet cards to determine the planets' relative distances from the Sun. The Benchmark does not contain errors.

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

- Assessment tools use clear pictures and graphics. For example, in Benchmark, 1 question 2 shows a picture of Mount St. Helens before and after its 1980 eruption. Students can easily see the difference in the landscape before and after the eruption. The End-of-Module Assessment provides a drawing for students to label, showing which materials from a table they will use to create a flood protection system. The graphic is easy to view and has clear lines for labels.
- For example, in Module 2, Lesson 11, students complete a Conceptual Checkpoint independently about fossils and environmental conditions. Students use a copy of the Conceptual Checkpoint and a copy of the Past and Present-Day Redwood Forest Locations Map. The student resources provide developmentally appropriate clear pictures for grade 3 to assess student knowledge. Level 3, Module 3, Survival and Change, End-of-Module Assessment, question 2 uses pictures of a butterfly life cycle, and each image represents a different stage. Teacher Edition: Level 3, Module 3, Spotlight Lessons on the Solar System materials include an End-of-Spotlight Assessment. The assessment includes an appropriate solar system model for grade 3.
- Assessments contain pictures and graphics that are developmentally appropriate. For example, in Benchmark 1, page 5 shows a picture of a cliff before and after a landslide. The picture is appropriate for the grade level and allows students to see a real image and the detailed changes due to the landslide.
- In the Module 2 End-of-Module Assessment, students view a piece of artwork and photographs of Everglades National Park, analyze pictures of animals in flooded environments, and use photographs of the Atala butterfly to order life cycle stages and identify body parts used in survival. The life cycle of Florida Arrowroot and Orchid graphics are also represented in the module and are in a clear and developmentally appropriate manner for grade 3. The picture and graphics embedded in the Module 2 End-of-Module Assessment are clear and allow the students to clearly understand the questions of the assessment. Level 3, Module 3, Survival and Change, End-of-Module Assessment, question 2b materials include the diagram of an Atala butterfly. Teacher Edition: Level 3, Module 3, Forces and Motion materials include an End-of-Module Assessment. The assessment includes developmentally appropriate pictures of children sledding and asking students to explain the mechanical energy seen in the picture they chose.

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. For example, Module 3, Lesson 28 materials provide clear guidance for teachers to efficiently manage a Socratic Seminar discussion. Materials guide how to review the routines and expectations for participating effectively in a Socratic Seminar, including classroom guidelines and resources for speaking and listening. Materials direct teachers to step in briefly to

reinforce norms for collaborative conversations and to pose one or two questions midway through the seminar.

- Materials include instructions for each assessment. For example, in Level 3, Module 3, Forces and Motion, Lesson 29, End-of-Module Assessment, materials include guidance for teachers. Materials state, "Before students begin the End-of-Module Assessment, play the video of a child sledding. Then, play the dogsled video. Explain that the sled video shows a child sledding down a hill, and the dogsled video shows a dogsled in Denali National Park in Alaska. After playing each video, provide a few moments for students to discuss what they notice with a partner. Then, distribute the End-of-Module Assessment and a copy of the Lesson 29 Resource to each student. Read aloud the assessment items. Have students complete the End-of-Module Assessment individually. When reading aloud the second assessment item, instruct students to measure the distance the sled traveled from the 0-meter mark. If necessary, provide additional time for students to finish."
- The materials include detailed information that supports the teacher's understanding of assessment tools and their scoring procedures. Materials provided in the Teacher Edition include sample answers for the End-of-Module Assessment. The rubric states, "Score each student's End-of-Module Assessment. The rubric describes evidence of student work that meets expectations. Use the blank spaces as needed to record evidence of student work that exceeds or falls below expectations." The alignment map provided lists the TEKS by each item number and includes the content standards, scientific and engineering practices, and recurring themes and concepts. For example, Module 3, Lesson 9, Conceptual Concept materials state, "This Conceptual Checkpoint assesses student understanding of the Concept 1 Focus Question: How can we describe and predict an object's motion?"

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. Materials provide suggestions of how teachers may accommodate assessments. For example, materials state, "Students engage with assessment tasks in a variety of ways, and teachers may modify assessment items as needed while preserving scientific rigor." Materials add, "Some students may need additional processing time and support 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."
- For example, materials provide "Differentiation" that instruct teachers to provide an audio recording of the assessment items for students who need additional reading support in Level 3, Module 3, Lesson 29. In addition, in Level 3, Module 3, Lesson 29, instruction is provided for the teacher to "Read aloud the assessment items."
- Materials offer guidance for teachers to provide accommodations for assessment tools so that students of all abilities can demonstrate mastery of learning goals. For example, materials provide a Conceptual Checkpoint that offers a differentiation sidebar note that states, "For students who need auditory or sensory processing support, consider providing alternative tactile resources or printed texts to help them connect with the content." Additionally, the sidebar Teacher Note for differentiation states, "Provide an audio recording of the assessment items for students who need additional reading support."

Great Minds PhD Science Grade 3

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

Materials provide recommended targeted instruction and activities to scaffold learning for students who have not yet achieved mastery. Materials provide 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 have not yet achieved mastery. Lessons include embedded support labeled "Differentiation," to support all students in meeting the lesson goals, including accommodations for activities and assessments as necessary. In Module 1, Lesson 3, a note suggests providing sentence starters to students who need support in writing their explanations. Another sidebar note in the lesson suggests having students provide one observable property per soil sample and describe their observations orally rather than writing them down. In Module 1, Lesson 4, Investigate Rocks, embedded support, "Differentiation," provides support by instructing the teacher to begin to shake tests before students begin. Teachers warn students that shaking rocks can make loud noises and some students may be sensitive to loud sounds. The teacher should consider providing these students with noise-reducing ear protection.
- Materials ensure that teachers can target instruction to develop precursor skills necessary to access grade-level content. Materials provide instructional practices to help teachers implement lessons such as student groupings, reading complex texts, videos and images, and models and investigations. For example, in Module 1, Spotlight Lessons on Changes in Matter, Lesson 5, Change a Liquid to a Solid, embedded support, "Differentiation," materials provide the option for teachers to display images of glass bottles, liquid glass, and glass products or re-watch videos of glassblowing a shaping from Lessons 3 and 4 to assist students in recalling their learning and experiences from the previous lesson set. Iin Module 2, Lesson 6, a Teacher Note in the sidebar is available to guide the teacher in providing differentiation for students who lack knowledge about how to read temperature correctly. "Students may need

additional support if the temperature reading is between two tick marks. Encourage students to estimate the temperature by rounding up or down to the closest tick mark."

- Materials provide additional resources for targeted instruction and differentiation to support students who have not yet achieved mastery. Materials provide additional resources for targeted instruction and differentiation to support students who have not yet achieved mastery through the embedded support Check for Understanding. For example, the embedded support, "Check for Understanding," in Module 1, Lesson 3, includes materials for students to use observations from an investigation and information from the texts to explain where the components of soil come from. The materials provide "Next Steps" to support students who need support explaining how part of the soil is formed by decomposition. Teachers show them the soil column with the plant material again, then show them a timelapse video of plant material decomposing to become part of the soil. Materials remind students that animal material also goes through the process of decomposition. Materials instruct the teacher to refer to the land samples and ask students if they think parts of the land samples may be made of pieces of rock.
- The Module 2 Pre-Assessment "provides recommended next steps for instruction to support learners with little to no knowledge of the components needed in a butterfly's environment." In the chart labeled "Check for Understanding," teacher instructions are given to help scaffold for misconceptions or lack of understanding for students. "It is not necessary for students to fully identify or understand all the components of a butterfly's environment at this point. If students need support identifying any key components of a butterfly's environment, consider displaying photographs of butterflies in their environment."

Materials provide enrichment activities for all levels of learners.

- The materials provide enrichment activities that account for learner variability. For example, the materials provide an embedded support called "Extension," located in the sidebar of the lessons. In Module 1, Lesson 2, an Extension is to read the fourth paragraph from the teacher read aloud which provides more background information on Surtsey.
- In Module 1, Lesson 3, students complete an activity where they have already compared local land samples by sifting and observing. The teachers then have students make observations about a prepared soil column after reading an article. The materials supply an Extension that instructs teachers to distribute sand, silt, and clay samples to groups, and then have students compare the samples with the separated components in the soil column allowing students a deeper examination of the soil.
- In Module 2, Lesson 9, the sidebar notes an Extension activity that all level learners may engage in to gain more information about the lesson through the research of paleontologists who have studied fossils using the Virtual Petrified Wood Museum website provided. In Module 2, Lesson 9, the sidebar notes an extension activity to learn about mammoths and why they are now extinct.
- In Module 3, Lesson 13, the teacher shares with students the story of Isaac Newton and his discovery of gravity. Materials provide an extension activity for students that want to know more about the history of the apple tree that Newton observed to visit the Natural Trust web page.

Great Minds PhD Science Grade 3

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

- The lessons include recommendations for just-in-time scaffolds to develop productive perseverance of learning in the moment. For example, materials include guiding questions throughout the lesson for the teacher as a means of supporting students when they struggle to maintain engagement on a self-engaged demanding task. In Module 1, Lesson 8, the Launch section of the lesson is the engagement portion. Students look at a picture of a shoreline. Questions are provided for the teacher to pose along with sample student responses.
- In Module 1, Lesson 9, students sketch in their Science Logbook a solution to slow or prevent a landslide like the one in the illustration. After students finish their drawings, materials instruct them to answer the question in their Science Logbook. The teacher circulates and prompts students with guiding questions such as the following: "How will your solution work? What materials did you select and why? What other materials could you use?" Students are then directed to share their thinking with a partner.
- Materials provide scaffolds and guidance for just-in-time learning for all students through the utilization of Check for Understanding boxes that contain a section labeled "evidence." For example, in Module 2, Lesson 13, the evidence box guides the teacher in what learning should be evident at this point in the lesson. If students have not met these criteria, the teacher is guided in the Next Steps box to scaffold the lesson and place the arrow in the correct order. "If students need support using arrows to model energy flow, focus on one organism at a time and ask the following questions: Where does the organism get energy? With an arrow, how do you show where the organism gets energy from? Which direction is energy moving?"
- Lessons provide support and resources for students who are ready to accelerate their learning. For example, materials include repeated support throughout the lesson for teachers to help students with content. In Module 1, Lesson 3, a Teacher Note provides information to help teachers support students by comparing the samples, by displaying the common land samples next to the local land samples.
- In Module 3, Lesson 12, students use an Atwood machine to explore how multiple forces acting on an object affect its motion. Materials suggest in an Extension in the sidebar that if students are interested in exploring Atwood machines further, they can engage in an interactive Atwood machine on The Physics Classroom web page. Materials provide a link for teachers to share with any interested student and the guidance to instruct students to focus on the object rather than the measurements which are provided for more advanced physics students.

Great Minds PhD Science Grade 3

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 of the 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.

- Materials engage students in mastery of the content through a variety of developmentally appropriate instructional approaches. For example, throughout each module, students engage in the learning cycle to make sense of and explain the Anchor Phenomenon and supporting phenomena. The Content Learning Cycle includes the five content stages shown in the following: Wonder, Organize, Reveal, Distill, and Know. Each part of the Learning cycle builds and allows the student to experience the content in a different format. For example, in Module 3, Sun, Earth, and Moon System, Appendix A, Lessons 3-5, the Story Line shows the teacher and student's actions as they move through a lesson cycle. In Organize, students are presented with a historical explanation of ancient Egyptians for the cause of sunrise and sunset, and wonder what causes the Sun to appear to rise and set. Students develop an Earth-view student model of the Earth–Sun system from the perspective of Earth by using a lantern to represent the Sun. Students work in small groups to model the apparent motion of the Sun from east to west. During Reveal, students label the celestial bodies on a diagram of Earth's solar system and read an article about Galileo's discovery of the moons of Jupiter through the use of a telescope. Students decide that models cannot include the Sun orbiting Earth and revise the Earth-view

student model so it demonstrates how Earth's rotation causes the apparent motion of the Sun. Students determine that Earth rotates counterclockwise when viewed from above the North Pole because of the east-to-west apparent movement of the Sun.

- Materials include a table that lists instructional routines that appear in the lessons. The table organizes the routines by main purpose. The sections for instructional routines include Collaborative Conversation Routines and Techniques, Written Response Routines, Terminology Learning Routines, and Text-Based Routines. For example, in Module 1, Lessons 5-6, students participate in a Chalk Talk Routine in which they, "observe the pictures and write descriptions or questions on the posters about the natural features and shapes of the land." This routine supports the objective of the lesson to describe landforms and compare photographs of landforms. After students write descriptions for each image, they then discuss as a class the similarities and differences that they see.
- In Module 2, Lesson 2, students demonstrate their understanding of the formation process depicted in *An Island Grows* by participating in the Act It Out instructional routine. The teacher rereads the first 8 pages of the text and instructs the students to act out each page as they hear it read aloud.
- In Module 3, Forces and Motion, Lesson 8, students use Think-Pair-Share to address questions such as, "What patterns of motion did you observe during the investigation? How would you describe the mechanical energy of the car right after the pendulum hit it?"

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

- The materials support a variety of instructional groupings (e.g., whole group, small group, partners, one-on-one). For example, the Implementation Guide provides a table with categorized instructional routines. Each routine has a suggested grouping. When looking at the written response routines a teacher could select a group routine, such as Chalk Talk, or an individual routine, such as Quick Write.
- In Module 1, Lesson 4, Earth Changes provides materials for a Gallery Walk where students' work is posted on chart paper or whiteboards around the room or at desks or stations. Students circulate in their groups to each station to closely view and discuss others' work before debriefing with the whole class. A Gallery Walk benefits students by deepening engagement and understanding and by allowing students to share their work with peers.
- In Module 3, Lesson 1, the teacher plays "The Eagle Has Landed," an audio recording of the lunar module Eagle landing on the Moon. Students are asked to discuss with a partner what they notice about the recording. In Module 3, Lesson 17, the teacher divides the class into small groups and assigns each group to an Atwood machine. In groups, students explore the movement of the Atwood machine as they manipulate the cups attached to the machine.
- The materials provide guidance to teachers on when to use specific grouping structures based on the needs of students. For example, materials explain in the instructions of the lesson whether students are working independently, in groups, or as a whole group. In Module 1, Lesson 5, Place, the materials instruct teachers to have students participate in a Chalk Talk routine in which they move silently around the classroom and observe the land in the photographs on each poster. Teachers tell students to focus on the natural features and shapes of the land and to write descriptions or questions about what they see directly on the posters. Students can also respond to classmates' questions or thoughts directly on the posters. The teachers divide the class into groups and assign each group to a different poster, allowing groups to spend about 3 minutes on each poster before instructing them to move on to the next one. This continues until all groups have observed the photographs on all six posters.

- The materials guide teachers on how to set up the lesson, such as individual, pairs, and whole groups. In Lesson 3, in Module 1, directions tell the teacher to "divide the class in half, and separate each half into groups." Students work in groups to look at soil samples. Then the directions instruct the teacher to bring the class back together to explain the next step of the lesson. Afterward, students are put back into groups to observe the properties of local land samples of soil. The materials include sidebar notes and Check for Understanding boxes that the teacher can use to support concept acquisition. In Module 1, Lesson 11, a Differentiation sidebar note suggests meeting with a group of students who would benefit from a reread. The same note also suggests reading certain pages aloud to the class if time permits.
- In Module 2, Lesson 17, students watch a video of leaf-cutter ants as a whole class and share what they notice and wonder and their thoughts about why the ants behave the way they do. Then, students are grouped to participate in a Jigsaw routine to read texts, record information, and answer questions about animals living in groups. Next, groups share information with the class about what they learned about animals living in groups which gets added to a class chart. After, groups return together to discuss and record similarities and differences among groups. Finally, students work independently to make a claim about animal groups providing evidence they have gathered.

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 multiple types of practices (e.g., modeled, guided, collaborative independent). The Teacher Edition clearly describes the actions of the teacher and the student and when the activities will be a class demonstration, teacher-guided, collaborative learning, or independent practice. For example, Lesson 3 in Module 1 includes a teacher demonstration of how to use the screen to sift the materials from the local land samples onto paper plates. During the demonstration, the teacher places materials that fall through the screen onto one plate and materials that remain on the screen after sifting onto a different plate.
- Lessons include opportunities for students to engage in collaborative learning structures, such as Mix and Mingle, while learning a new concept. In lesson 12, students share ideas for actions people could take to solve problems that are represented in the photograph that they are investigating. The lesson provides 3 guiding questions for students to answer in their groups: 1, How are the two systems similar? 2, How are the two systems different? and 3, What are the parts of each system?
- In Module 2, Lesson 13, students engage in collaborative efforts to work in pairs, arranging cards to develop a food chain. Then, pairs join together and compare their food chains. The teacher then guides students through a class discussion, where students identify producers and consumers in the food chain. Finally, students independently write in their Science Logbooks to explain how energy flows in the food chains their classmates shared.
- In Module 3, Lesson 5, materials include sidebar notes to help guide teachers to include metacognitive strategies with students. Lesson 5 includes the following note: "Responding to these questions provides students with an opportunity to engage in the practice of analyzing and interpreting data as they discover the relationship between distance, time, and speed."
- The materials provide teacher guidance and structures for the effective implementation of multiple types of practices. For example, materials state a clear purpose and learning goals for the group and independent practice activities contained in units and lessons. Each lesson has a Prepare section to give guidance on what will happen in the lesson cycle. In Module 1, Lessons

3-4, students explore the composition of land as they investigate the Phenomenon Question: "What is land made of?"

- Materials include lessons in which students work in groups to investigate concepts. In Module 1, Lesson 10, the materials provide instructions for the teacher on how to explain to students how they will use a model to investigate interactions between wind and sand. Instructions include how to lay out the parts of the model, what each part represents in the model, how to use the materials in the model, and how to collect observations from the model. Notes are provided to the teacher to help students think about different ways to organize their data. Sample responses are provided for the teacher. Students work in groups to complete their investigation.

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. For example, the Implementation Guide in "Characteristics of Rich Phenomena" describes the social context of the materials using phenomena to exhibit enduring significance in diverse cultures and content areas. In Module 1, students read about women in *Marvelous Mattie: How Margaret E. Knight Became an Inventor (McCully 2006).*
- In Module 1, depictions of places are respectful and do not include people. The focus is on the landscape and how it is formed. The overall phenomenon focus is the Island of Surtsey. For example, materials use various landform images from different areas of the United States. The module phenomenon focus is on the Island of Surtsey in Iceland, and includes a list of images and places: Wall Arch in Utah, SouthCore Banks in North Carolina, Channel Islands National Park in California, Cape Cod in Massachusetts, Buffalo Gap National Grassland in South Dakota, Hawai'i Volcanoes National Park in Hawaii, White Sands National Park in New Mexico, Grand Teton National Park in Wyoming, Devils Tower National Monument in Wyoming, Surtsey in Iceland, Sphinx in Egypt.
- The diversity of communities is represented in the images and information about people and places in the material. For example, in Module 2, Lesson 3, students are introduced to a glass recycling project in Nairobi, Kenya, through a video. A Teacher Note suggests using a map to connect students to Kenya and its capital.
- In Module 3, Lesson 3, as students examine motion on Earth, materials provide the following video: *Young Female Argentinian Footballers Playing on Field*. Students build their knowledge on what motion on Earth is like compared to movement in space. In Module 3, Lesson 6, in small groups, students observe photographs in a set of motion cards. The cards include a picture of a person in a wheelchair. In Module 3, Lesson 21, materials provide time for students to discuss the properties of magnets that allow people on Earth to use them to keep magnetic objects in place. A *Cooking in Space: Whole Red Rice and Turmeric Chicken* video includes a female astronaut.

Great Minds PhD Science Grade 3

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 linguistic accommodations commensurate with various levels of English language proficiency as defined by the ELPS. In the Implementation Guide, materials provide information that in every Teacher Edition, English Language Development notes appear in the body of the lesson, while others appear in sidebars. Inline supports provide strategies beneficial to most students, such as explicit introduction to new terms and collaborative conversation routines, while sidebar supports provide targeted scaffolds for specific needs. In addition, each module includes appendices titled Content-Specific Words, General Academic Words, and Spanish Cognates. Though these appendices are not comprehensive, they list many important words used in the module as well as Spanish cognates when applicable.
- The material provides teacher support boxes in lesson instructions titled "English Language Development." For example, in Module 1, Lesson 1, the box provides suggestions to help students understand the term *island*. Tips include pronouncing the word for modeling, breaking the word into syllables, using photos to provide a visual example, and providing the Spanish cognate *isla*. English Language Development purple boxes in lessons provide sentence frames to support English learners as scaffolding for vocabulary development, such as "...is a landform because…." and "…is not a landform because…."
- In Level 3, Module 2, Lesson 3, a Teacher's Note in the sidebar labeled "English Language Development" guides teachers on sentence frames that can be used for the lesson to help students better understand and use in context the word measurement. "The discussion in this activity involves the word measurement. English learners may benefit from additional

scaffolding in the form of sentence frames. Consider using guiding questions and sentence frames such as these to scaffold conversations (2I):
    - The measurement of my height is….
    - The measurement of the length of my pencil box is….
    - …is a unit we can use in measurement."
- In Teacher Edition: Level 3, Module 3, Spotlight Lessons on the Solar System, Lesson 5 materials provide teacher guidance for linguistic accommodations. Materials suggest the teacher "introduce the term orbit (noun) explicitly. Providing the Spanish cognate órbita may be helpful. Consider showing students images of the curved path of a spacecraft around a planet." In Module 3, Lesson 1, materials guide the teacher to introduce the term motion by pronouncing the word and having students repeat the word. Materials suggest the students act out the word motion by walking around the classroom.

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

- Materials encourage strategic use of students' first language as a means to linguistic, affective, cognitive, and academic development in English. In the Implementation Guide in English Language Development, materials provide teacher guidance for grouping students who speak the same home language at complementary proficiency levels and can provide additional scaffolding by allowing English learners to converse in their home language, thereby supporting English comprehension and understanding.
- The Implementation Guide has teachers consider using students' own words when recording questions and related phenomena on the driving question board and when adding labels and explanations to the anchor model. Student language on anchor visuals may include everyday language and students' home language.
- The Implementation Guide also provides a paragraph about Bilingual Program Considerations. Appendices C & E provide Content-Specific Words, General Academic Words, and Spanish Cognates—a list of key terms in the module and their Spanish cognates to support English language development. The material provides a summary in Spanish, links for translation of instructional language, and links to access videos with Spanish dubbing or closed captioning in the Implementation Guide.
- In Level 3, Module 2, Lesson 1, the sidenote labeled "English Language Development" advises the teacher that the word *survive* is used frequently in the Module and explains how to use the Spanish cognate to understand the word. "The word survive is used frequently in this module. Providing the Spanish cognate *sobrevivir* may be useful. Provide the meaning of the word in alternate contexts by using guiding questions such as these to scaffold conversations (2C): What do you need to survive? What does a plant need to survive?"
- For example, in Module 3, Spotlight Lessons on the Solar System, materials provide an appendix with Spanish cognates. Appendix E includes terms such as *orbit-orbita* and *solar system-sistema solar*. In Module 3, Forces and Motion, Lesson 10, materials provide an embedded instructional support that guides the teacher with language strategies to support all students in developing academic English within the context of the lesson goal. Materials provide the following guide: "The terms force, contact, and exert are used repeatedly in this module. Introduce these terms explicitly. Providing the Spanish cognates for force (*fuerza*) and contact (*contacto*) may be useful."

Great Minds PhD Science Grade 3

Indicator 7.4

Materials provide guidance on 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 provide guidance on 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.

- Materials provide information to share with students and caregivers about the design of the program. Each grade level includes the Family Tip Sheet Overview as a resource, available in English and Spanish, that gives families and caregivers an overview of the PhD Science Texas curriculum and suggests ways to participate in and extend learning outside the classroom. For example, Family Tip Sheet, Level 3, Modules 1–3, Overview for Families, provides a paragraph that answers the question, “What is PhD science?” Materials provide the following: “PhD Science Texas is a knowledge-building, phenomenon-driven curriculum. An anchor phenomenon, an observable event that can be explained or predicted, gives students a real-world context for their learning.”
- The document provides caregivers with information about PhD Science Texas, what students do in class, what a lesson will look like, how science is connected to other disciplines, how to help students, and what students will study at each level. For example, the Level 3, Module 2, Family Tip Sheet includes a lesson overview of Module 2, as well as what students will learn throughout the Module. “Lesson Overview: Your student is learning how butterflies survive over time in a changing environment. Students will apply this understanding to other animals and plants that have survived or become extinct.”

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

- Materials provide resources and strategies for caregivers to help reinforce student learning and development. The Family Tip Sheet provides Conversation Starters for each module and level to

support students' learning. In Level 3, some conversation starters for caregivers are "Discuss forces and motion in everyday life. Ask questions such as the following: Why does a bike move faster while going downhill? Talk about how forces affect the motion of a ball in different sports. Ask students how their daily activities might differ on the International Space Station. Observe the night sky and talk about which objects in the sky are close to Earth."

- Materials provide online resources for caregivers to reinforce student learning and development, such as in Module 3, where materials provide a website to learn more about the International Space Station. Materials include the following tips: "Talking about science, watching science videos, or visiting a museum, park, or zoo are ways to support students' learning."
- Materials provide at-home activities for caregivers to help reinforce student learning and development. For example, in the Family Tip sheet, a section is included that is titled, "How can I help?" This section explains that the Family Tip Sheet outlines the Module Concepts and includes ideas on how caregivers can support the student at home. The Family Tip Sheet also provides suggestions to visit the "National Science Teaching Association's Tips for Busy Parents" website. Materials provide optional homework for caregivers to help reinforce student learning and development. For example, in Module 1, Lesson 8, students observe water and land interactions to describe how water can change the shape of the land. The optional homework for this lesson is to find examples of water changing land in their area and draw and share their findings with family, friends, or the class.
- Level 3, Module 3, home activity suggestions state, "Look for magnets in the home to explore how magnets are used in everyday objects. Watch a sporting event, and encourage your student to describe the motion of objects they observe and how forces affect the motion. Find examples of objects that move in different ways, such as swinging, bouncing, or spinning. Research facts about a favorite planet. Identify examples of light, sound, and thermal energy around the home."

Materials include information to guide teacher communications with caregivers.

- Materials include teacher guidance for communicating with caregivers. Materials supply a Family Tip Sheet overview and a Family Tip Sheet for each module for caregivers to understand the PhD Texas instructional materials. The Implementation Guide provides a section for additional teacher resources and includes the Family Tip Sheet (Overview) and Family Tip Sheet (Module). The materials state, "This resource, available in English and Spanish, gives families and caregivers an overview of the PhD Science Texas curriculum and suggests ways to participate in and extend learning outside the classroom." The Implementation Guide mentions that the Family Tip Sheets are provided in English and Spanish.
- Materials include teacher guidance for communicating with caregivers in the Communicating with Caregivers section of the Implementation Guide. For example, The Family Tip Sheet contains a section, "How are students assessed," and materials list the formal tasks of Science Challenges, Engineering Challenges, an End-of-Module assessment, and Socratic Seminars in the modules. The materials state, "The balance of ongoing and cumulative assessment allows instruction to be adjusted throughout the module to ensure that students are progressing."
- Materials provide teachers guidance for sending home completed assessments and rubrics at the end of each module and spotlight lessons to provide an opportunity to share students' progress. Additionally, materials provide an optional homework activity with each lesson and guide the teachers to consider sending notifications in a weekly class newsletter, homework planner, or digital message system to alert families of the homework.

Great Minds PhD Science Grade 3

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 cohesive scope and sequence that shows how science knowledge and skills are addressed over the course of the entire year, grades K through Grade 5. The scope and sequence provides pacing information (for each module component) and a summary of the focus standards addressed and assessed in each module of each grade level.
- Materials also include a comprehensive TEKS Content Development Progression document within the implementation guide. The progression document lists each module and spotlight lessons from grades K through grade 5 and correlating TEKS, ELPS, recurring themes and concepts (RTCs), science and engineering practices (SEPs), and scientific concepts that are covered within each module or spotlight lesson. Modules for each grade level also include any other previous grade-level standards that are also spiraled into the module. The progression document clearly shows the order in which knowledge and skills are taught and built in the course materials.
- Each module and spotlight lesson includes a progression of concepts outlined in the Module (or Spotlight Lesson) Map document. For example, in the Earth Changes module, the map lists the anchoring phenomenon, essential questions, and a progressive list of concepts (such as the composition and shape of land) with focus questions, such as How can we describe land? For each concept, phenomenon questions, a bulleted list of student learning with corresponding lessons, and a list of correlating TEKS and ELPS are included.

Great Minds PhD Science Grade 3

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

- The materials provide teacher clarity in understanding how activities and experiences connect concepts and SEPs. Materials include in each module's appendix a Module Storyline, written from the student's perspective, and describe how students engage with core concepts, practices, and themes as they seek to make sense of phenomena throughout the module. For example, in the Survival and Change Module Storyline, materials provide a detailed progression of how students engage with animal survival and change concepts using SEPs through the lens of the recurring theme of change. In one portion of the Storyline, students describe how watching a video of leaf-cutter ants, and noticing how the ants move in a line and carry pieces of leaves, prompts them to explore why some animals live in groups. The Storyline includes both student activities and actions, and also what they are noticing and learning along the way, such as, "We discuss why each kind of animal lives in a group, the size of different animal groups, and where each animal group lives…We compare the different kinds of animals and notice that animal groups vary in size, and animals form groups for different purposes. We notice that animals that live in a group behave in ways that help the whole group survive." Later in the lesson, students discuss potential change in the class, how the change affects the classroom system, and how they could work together to deal with the change. This segues into a deeper understanding of how animal groups cope with changes.
- Teachers can use the Prepare section of each lesson set to see how students develop scientific understanding during a lesson set. The Prepare section includes Knowledge Statements and Objectives, which are brief reflections of student actions in advancing their learning during a lesson. They begin with a verb that explains what students will do to build an understanding of a sub-component of the Knowledge Statement. For example, in the lessons on wind and land interactions in the Earth Changes module, materials include the Knowledge Statement, "Wind can move rocks, soil, and sand from one place to another, which changes the shape of land." Materials include objectives for the lessons, such as students planning an investigation to gather evidence about how wind and land interact and students comparing solutions to problems caused by wind changing the shape of land.
- Materials include within the Teacher Guide sidebar notes explaining how a lesson activity develops students' understanding of content, concepts, and practices throughout the year and across grade levels. For example, in Lesson 20 of the Earth Changes module, the Spotlight note provides teacher clarity in facilitating student connections between time spans of different Earth events using the concept of scale. After students investigate Earth Event cards (photos of the eruption of Mt. St. Helens, a photo of a wave rock, etc.), materials direct the teacher to tell students each Earth event happened over a different time span or length of time. The Spotlight sidebar states, "Students use the concept of scale to compare the time spans of different Earth events," which helps teachers understand how the photo task helps students connect concepts and recurring themes, such as scale.
- At the end of each module and set of spotlight lessons, students can reflect on RTCs in module learning. Students make connections between their use of RTCs and the concepts learned. Materials provide clear, scripted guidance for teachers to facilitate student-made connections. For example, at the end of the Earth Changes Module, students reflect on their use of stability and change (3.5G) to describe how changes happen to Earth's surface. After discussing concept statements from the module, such as Earth events change land over short and long time spans, materials direct teachers to ask questions to help students connect recurring themes and ideas,

such as How do some of these statements relate to systems? and How do some of these statements relate to scale, proportion, and quantity?

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

- Materials include information about review (including any previous grade-level content) and practice of knowledge and skills throughout lessons in the Pacing Guide. In the horizontal and vertical alignment section in the implementation guide, materials list all module and spotlight lessons in third grade and how each continues to spiral throughout lessons during the year. For example, matter and its properties and Earth and Space are both featured in Module 1, Earth Changes, and are intentionally spiraled into later modules in the grade 3 program.
- Materials regularly allow for students to practice and build on previously taught science knowledge and skills through the use of Spotlight on Knowledge and Skills sidebar notes. Students have the opportunity to review TEKS taught in previous years before addressing the TEKS for the current school year. For example, the Spotlight materials state that in Level 2 (grade 2), students identified solids and liquids (2.6A) and explored how matter can change through processes such as melting (2.6B). In Level 3, students revisit solids and liquids in this lesson and continue to build on their knowledge in the Changes in Matter Lessons (3.6C).
- In each module, materials provide several checks for understanding tasks to assess knowledge and skills. For example, Solar System Lesson 1 has a Spotlight on Knowledge and Skills sidebar to reinforce that students explored how the Sun is a star that provides light and heat from Level 2, Objects in the Sky. In Solar System Lesson 2, the Spotlight in Knowledge and Skills reinforces the previous module that students measured, tested, and recorded physical properties that help them to measure and record air temperature.
- The materials provide regular and consistent review and practice of knowledge and skills to support mastery and retention. For example, Extension Activities included for each module provide practice of knowledge and skills. The materials allow students to work in teams or individually to complete the extension. In Extension Activities for Module 2, students work individually to draw or write daily observations about live caterpillars.
- Materials include a student “Science Logbook” that elaborates how a lesson activity develops students’ understanding of content, concepts, and practices throughout the year and across grade levels. For example, at the end of each lesson, students record responses to the questions. In Level 3, Module 2, Lesson 1, students have the opportunity to write in their logbook questions they still have about butterflies to create an anchor chart using a student-generated list of phenomena that is used throughout the module; students can add to the list any time relevant, related phenomena are suggested.
- Materials identify content standards as Introduced, Addressed, or Mastered in the Standards Addressed table at the beginning of each lesson set. The Introduced label appears in the first lesson set in a level in which students interact with a particular standard. The Addressed label appears in all lesson sets from those lessons that introduce a standard through those lessons that demonstrate mastery of the standard. The Mastered label appears in lessons that assess a standard for the final time, and students demonstrate understanding. Some content standards may be introduced in one module and then addressed and mastered in a later module.

Great Minds PhD Science Grade 3

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.

- The materials include overview documents to support teachers in understanding how to use all materials and resources as intended. For example, a 3–5 Review Walkthrough video provides an introduction to PhD Science and explains each component in the reviewer resources and student resources section. Materials contain an implementation guide with a visual map of the recommended sequence of module implementation with details of concepts and lessons broken down by the standards. Materials provide a curriculum map that includes the module titles, anchor phenomenon, spotlight lessons title, and spotlight lessons anchor phenomenon. A pacing guide, preparation guide, and scope and sequence are explained for teacher ease of use in the Implementation Guide.
- The Teacher Edition provides key terms and Advanced Materials Preparation to prepare teachers for upcoming activities and suggestions for additional reading that will support teachers' use of materials. The sidebar found in the Teacher's Edition contains instructional supports to include cross-content connections, differentiation, and teacher notes. Materials contain links to embedded technology in the Teacher's Guide as options for teachers to use to

support student learning. For example, Level 3, Module 1, Lesson 7, contains an extension in the sidebar guiding teachers to "Return to the Icelandic Institute of Natural History's three-dimensional Surtsey model. Point out on the model the three locations featured in the diagram." The description contains a link that allows the teacher to display and manipulate 3D models of Surtsey in 2019 and in 2021.

- The materials are organized in a way that facilitates ease of implementation and use, including assessing and storing materials. Tools to support navigating the resources include a table of contents in each module, tabbed pages to easily identify lessons within the module, and a lesson agenda at the beginning of each lesson to guide the teacher.

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

- The materials include science standards correlations for lessons units, lessons, and activities within the context of the grade level in teacher guidance documents. For example, the Teacher Guide begins each module with a map of the phenomenon, student learning by lesson, TEKS for Science, and ELPS for the module. Science standards are listed in each module, with standards in bold to identify what standard students should master in that module. The material indicates the standards that are being developed in the current module through the use of italicized text. Modules also contain Spotlight Lessons, which also contain an overview to describe TEKS and the lessons.
- The materials include cross-content standards for ELA, Math, and Social Studies in sidebar support within the teacher's guide to lessons. Materials also include a Content Area Connection within each module that lists embedded cross-content correlations to English language arts and mathematics standards. Materials include cross-content material within extensions, reminders, and examples for reinforcing reading and writing, calculation, and problem-solving skills as students apply them to science learning. For example, in Level 3, Module 1, Lesson 3, there is a sidebar that provides guidance on a content area connection with math that the teacher may utilize to facilitate student connection to the lesson. For example, in Level 3, Module 2, Lesson 3, there is a sidebar that gives guidance on a content area connection with English that the teacher may utilize to facilitate student connection to the lesson.

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

- The materials include a comprehensive list of all equipment and supplies located under the section "Instructional Hands-On Materials Kits" as well as within each Module and Spotlight Lessons Prepare section of the Teacher Guide.
- Resources include a list of student and teacher materials required for the lesson or lessons to support instructional activities. Materials offer an Instructional Hands-On Materials Kit (for purchase) for each module that contains all materials needed for modules. Teachers can view a comprehensive list of all equipment and supplies needed to support instructional activities, as well as which supplies are available in the refill kit. Each module provides a list of materials needed before each lesson within the "Prepare" section. The materials list is broken into student materials, teacher materials, and teacher preparation. For example, Teacher Edition: Level 3: Module 1, Earth Changes Materials includes a list of student materials that include a science logbook, plastic bag, and land samples. Level 3, Module 1, contains an Advance Materials Preparation list, stating that the soil investigation will require three to four days in

advance to prepare the soil column. The Local Land Samples Observation will require one to two days in advance for students to collect soil samples from their homes.

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

- The materials provide teacher guidance for safety practices and grade-appropriate use of safety equipment during investigations, in accordance with Texas Education Agency Science Safety Standards. The Implementation Guide contains a Safety section with a list of personal protection equipment such as goggles, gloves, and aprons. Materials recommended that teachers design and hang a safety poster in the classroom for students to refer to at any time, and refer to the chart when explaining safety expectations before a science activity. Each Module Overview found in the Teacher Edition contains a section titled “Safety Considerations.” The materials state, “Safety considerations appear in the Module Overview section of each module, and additional safety notes for teachers appear in lessons. These instructions should be regarded as the minimum safety precautions, and teachers may elect to implement additional precautions.” Some Safety Considerations include tips for teachers, such as explaining all safety considerations to students and reviewing all safety expectations before each activity. Students must demonstrate appropriate classroom behavior (e.g., no running, jumping, or pushing) during science investigations.
- The materials provide student guidance for safety practices and grade-appropriate use of safety equipment during investigations, in accordance with Texas Education Agency Science Safety Standards. During the first module of each grade level, students review and sign a Safety Contract and take a Safety Quiz. Materials provide guidance for safety procedures specific to a lesson activity within in-line or sidebar Safety Notes. For example, Level 3, Module 1, lists safety considerations for all investigations included in the module. In Lesson 3, there is a purple box with a safety note reminding the teacher to review the safety contract with students. Students must wear safety goggles, avoid putting samples in their mouths, tell the teacher if a spill occurs, and wash their hands.

Great Minds PhD Science Grade 3

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.

The 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.

- The materials include support for specific scheduling considerations, with guidance for covering required science content for the grade level/course within various schedules. Materials contain an overview providing teachers with considerations for planning instruction at the module and lesson levels. The Pacing Guide includes pacing information with total instructional days for each module and total days for each lesson. Teacher choice days for review are included in the pacing guide. For example, Level 3, Module 1, should not take more than 49 days to complete.
- The materials include guidance and recommendations on required time for lessons and activities with options for various scheduling considerations. Materials provide each lesson with an agenda that paces out each component of the lesson and how much time the teacher should allot for that component. Each concept lasts from 2–12 days in length, depending on the number of minutes within a science block. For example, the Lesson “Properties of Objects and Materials” lasts two days or 90 minutes, and “Changes in Matter” lasts three days or 135 minutes. Materials also contain guidance for the time needed for teacher-led instruction and classroom collaboration. Each part of the lesson segment also contains a timestamp; for instance, the Explore Celestial Navigation has a heading stating it should be implemented in 12 minutes, the Identify Patterns should be implemented in 10 minutes, and Develop a Navigation Model should be implemented in nine minutes.

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

- Materials provide guidance for strategic implementation that ensures the sequence of content is taught in an order consistent with the developmental progression of science. Materials

include a suggested sequence of units that considers the interconnections between the development of conceptual understanding and scientific and engineering practices. Materials state, “PhD Science Texas modules are sequenced to build coherent student understanding of science ideas. Each module provides opportunities for students to explore questions and apply knowledge and skills they developed in previous modules.”

- The Curriculum Map provides an at-a-glance view of module titles, anchor phenomena, and Spotlight Lesson titles for each level, with color-coded tables that show when students are learning and building upon previously taught concepts. Modules allow students to explore questions and apply knowledge and skills they developed in previous modules. For example, Level 3, Module 1, focuses on Earth and Space. Later in Module 3, students are brought back to the concept of Earth and Space in the spotlight lessons provided.
- Each module’s Pacing Guide emphasizes the application of concepts throughout the school year. For example, Pacing Guide: Level 3, Module 1, Earth Changes provides a progression of concepts with lessons that students engage in before undertaking an engineering challenge. Students progress through lessons that first describe land, then look at the changing shape of the land, and finally, an engineering challenge on how to slow changes to the land.

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

- The materials include modules, lessons, and activities for a full year of instruction. Materials outline a full year's worth of instruction which includes 34 weeks of total instruction, including assessments, teacher choice days, spotlight lessons, and challenge days. For example, each module contains 25 to 35 lessons organized into two to four concepts. Materials include a Year at a Glance document that includes recommendations on how to cover all material within the year. The Year at a Glance includes a visual that shows where all three modules fit in a year. Materials state that “to ensure completion of each module, it is recommended to teach science five days a week.”
- Materials provide teacher guidance on how to make adjustments to extend or condense units and lessons within the Teacher’s Guide if scheduling allows for additional instruction days or needs to be shortened due to lack of time. The pacing guide provides suggestions to teachers that will help them bridge the gaps for review, assessment, and other instructional support as needed. The Pacing Guide provides options “to allow teachers to maximize instructional time while remaining responsive to students' needs,” but the options do not omit parts of lessons. For example, the Pacing Option Key includes a calendar symbol and denotes a lesson that can be taught in one day or split into two days. Lesson 1 in Module 1, Earth Changes, can be taught as follows, “Day 1: Launch through Define Land” and “Day 2: Explore Natural Features of Local Land.” The Pacing Option Key also includes Instructional Notes, represented by a clock image. The Instructional Notes describe time-saving strategies such as sentence frames for writing assignments and Teacher Notes that suggest alternative activities. Extension activities are also provided to extend student learning.

Great Minds PhD Science Grade 3

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.

- Digital materials include an appropriate amount of white space and an overall design that does not distract from student learning. Appropriately designed student material supports student learning. Teacher's Guides are designed so that teachers can locate important information easily for planning and implementation. The Teacher Editions include a title with subtitles and sidebar information for the teachers. Materials use color-coded boxes with sidebar notes and embedded instructional supports to easily identify important information.
- Materials include links within modules for additional reading for teachers. The content is organized, with prominent and clear titles and headings, and sections marked with subheadings. For example, grade 3, Science Logbook, Lesson 4, Activity Guide B, includes a clear title and table for students to record results. Grade 3 lesson resources include Motion Cards that are clear and in color.

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. Materials embed age-appropriate pictures in the Student Logbook and as Reference Materials throughout each Module. In the Student Edition, Module 1, Lesson 6, materials provide students with clear photos of landmarks to help with their learning.

- In Level 3, Module 3, Solar System, Lesson 2, Activity Guide B, in the Student Logbook, the materials show pictures of a girl playing the flute, kids playing outside, people camping by a fire, cars on a street, and boiling pot of water.

Materials include digital components that are free of technical errors.

- The materials include digital components that are free of technical errors. Materials are free of spelling, grammar, and punctuation errors. Materials are free of inaccurate content materials or information. Materials are free of wrong answer sheets to problems. For example, the Level 3, Module 2, Survival and Change, End-of-Module Assessment is free from technical errors.
- The Teacher's Edition includes activities that are free of inaccurate content materials or information. The materials are also free of wrong answers to questions being asked. For example, Module 1 provides accurate information about how land can change shape over time through weathering. The materials are clear of errors in the Student Edition: Science Logbook. The Module 3, Student Edition, is free from spelling, grammar, and punctuation errors.

Great Minds PhD Science Grade 3

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. For example, all components are available on a digital platform. Materials offer a digital platform that provides all components that teachers and students can log in and use at any time. The Implementation Guide states that all product components can be found in the Great Minds Digital Platform, stating, "Facilitation slides are available through PhD Science TEKS Edition Projected for each day's lesson." Additionally, "PhD Science TEKS Edition in Sync® offers video lessons and assignments for continuous learning so students can build knowledge if they—or the teacher—have to take time away from class," and "Alt text is available for images on the Great Minds Digital Platform."
- For example, in Level 3, Module 1, Lesson 2, materials provide a link to a three-dimensional interactive model from the Icelandic Institute of Natural History. Students are working to develop an anchor model to explain the formation and transformation of Surtsey. The model helps students determine the best way to draw their anchor model that shows the land features and changes to its land.

Great Minds PhD Science Grade 3

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. For example, materials provide links to videos to support student conceptual understanding. Materials use videos throughout the lessons to support student engagement with the science and engineering practices, recurring themes and concepts, and grade-level content. Video links are found in the Teacher Guides in the lesson outline, and sidebar notes for additional academic support.
- For example, in Level 3, Lesson 2, materials provide two videos for students to view. Students are developing their understanding of how the island of Surtsey was formed and then shaped over time. Students first watch a video of a volcano erupting. Students share what they notice with their peers. Next, they watch a video of lava cooling. Students share their observations from the video. Next students demonstrate their understanding of how an island forms. The observations and explanations help them design a model that shows how an island forms.

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. Materials offer videos for students to review and respond to in their journals and during class discussions. Materials do not offer or provide guidance about utilizing digital collaboration tools for students or teachers to video conference or collaborate online during or outside school hours. The Implementation Guide lists the product components, and materials offer access to most components through the digital platform, except Knowledge Deck Posters and Cards. The investigations are not offered through simulations.

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

- Digital materials are accessible and compatible with multiple operating systems and devices. For example, materials offer a PhD Science in Sync platform. Videos and tasks can be assigned to students through this PhD Science In Sync platform. The materials are accessible online through any device with internet access. PhD digital platform is optimized on laptops and desktop computers with a minimum of 1 GB RAM and 2 GHz processor and Broadband internet connection. Materials are fully supported on the last two major versions of the following browsers: Chrome and Safari. Information is found in Help Center Home>Technical Support>General Information>Technical Specifications.

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Indicator 9.3

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

1	Digital technology and online components are developmentally appropriate for the grade level and align with the scope and approach to science knowledge and skills progression.	Yes
2	Materials provide teacher guidance for the use of embedded technology to support and enhance student learning.	Yes
3	Materials are available to parents and caregivers to support student engagement with digital technology and online components.	Yes

Not Scored

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

Digital technology and online components are developmentally appropriate for the grade level and align with the scope and approach to science knowledge and skills progression. Materials provide teacher guidance for the use of embedded technology to support and enhance student learning. Materials are available to parents and caregivers to support student engagement with digital technology and online components.

Evidence includes but is not limited to:

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

- 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. For Example, in Level 3, Module 1, Lesson 2, students use Google Earth ™ mapping service to examine the natural features of their local land area and Surtsey. Students organize their thinking around natural land features to determine a need to gather information from other resources to help them answer the Phenomenon Question, "What is happening to the island of Surtsey? Display Google Earth™ mapping service. Briefly demonstrate how to rotate the image of Earth to show all its parts. Zoom in on students' locality until some of the land features students described in the previous lesson are visible."
- In Level 3, Module 2, Lesson 19, students use a map on a website to more easily analyze data for monarch butterfly sightings. This data analysis helps students reveal that migration is the movement of animals from one location to another. "Show students the Journey North website. Explain that people throughout North America go to the website to report sightings of monarch butterflies and that scientists and interested citizens can use the compiled data to learn more about these insects."

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

- Materials provide teacher guidance for the use of embedded technology to support and enhance student learning. The Materials page under the teacher preparation section in Module 1, Lessons 1-2, contains advanced preparation for using Google Earth ™ mapping service to examine the natural features of their local land area and Surtsey. The materials provide the description, "Access Surtsey's three-dimensional interactive model from the Icelandic Institute of Natural History," followed by the hyperlink for teachers to use in class.
- In Level 3, Module 2, Lesson 19, Resource C, materials provide specific teacher instructions for using the Journey North website. Using the Journey North Website Sighting Data Instructions, teachers follow the instructions to access adult monarch butterfly sighting data. Teachers first access the website using the hyperlink in the materials. The teacher selects the Sightings tab at the top of the page. Teachers Under the View Sightings heading, the teacher selects the season and tear for monarch adults sighted and then clicks View Data. The website provides a table with sighting dates, locations, and the number of adult monarchs.

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

- Materials are available to parents and caregivers to support student engagement with technology and online components. In the Level 3, Module 1 Family Tip Sheet, under the additional resource section, parents are given a website to support students with further learning about volcanoes. In the Level 3, Module 2 Family Tip sheet, under the additional resources section, websites are given to support learning about butterfly migration and a National Monument, stating, "Learn about monarch butterfly migration at the provided website. Explore the Florissant Fossil Beds National Monument at the provided website."