Discovery Education Science Techbook for Texas Grade 7

Discovery Education Science Techbook for Texas Grade 7 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 6	100%	100%	100%	100%
Grade 7	100%	100%	100%	100%
Grade 8	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 some 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 some variety of TEKS-aligned and developmentally appropriate assessment tools.

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- 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 some 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 some 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 intentionally 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 Grade 7

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, as outlined in the TEKS in a variety of lesson types, including STEM Project Starters, found in all concepts. For example, in a grade 7 lesson on Matter and Solutions, the Unit Planner identifies the TEKS 7.1.G, 7.3.A, 7.3.B, 7.3.C, 7.4.A, 7.4.B, 7.4.C as standards taught in Concept 1. These TEKS correlate with the Scientific and Engineering Practices (SEPs).
- The materials provide multiple opportunities for students to practice grade-level appropriate SEPs. Each concept provides teachers with a 5E model that includes having students explore the various science concepts. SEPs are introduced in the Engage lesson, practiced/developed in the Explore lessons, and assessed in the Explain lesson and Extension lessons. For example, in a

grade 7 lesson, “Observing Earthquake Locations,” the materials guide students to draw a model of the phenomenon presented in the lesson. The materials then ask the students to describe the model and after collecting further evidence, revise the models.

- The materials provide multiple opportunities to show mastery of grade-level appropriate SEPs. In a grade 7 lesson, “Motion and Energy,” the scope and sequence allows for the following: observations, investigation of how unbalanced forces cause marbles to move, exploration of unbalanced forces in a monster truck simulation, explanation, and elaboration about Newton's First Law, and evaluation to show mastery of the unit. Each Concept includes an Evaluate section for students and a Summative Assessment Concept Check-In.
- Extended opportunities to practice engineering design processes are available in multiple lessons. These additional practices include opportunities to design solutions to problems, evaluate them, and revise them. Additionally, investigations provide opportunities to practice analyzing data and building models. There are multiple opportunities for students to develop, practice, and demonstrate mastery of the grade-level TEKS.
- The program design contains an intentional scientific and engineering practices (SEPs) Scope and Sequence. Additionally, at the course level, teachers can use the searchable TEKS functionality to select specific SEPs and identify which concepts they are introduced, spiraled, and assessed in. Teachers can click the “TEKS'' button on the course landing page, select an SEP standard, click the downwards arrow, and navigate directly to the aligned concepts. From this view, teachers can see how the practices are spiraled throughout the course if they click on Science Techbook for Texas - Grade 7 > Course Landing Page > TEKS. The materials also outline how students will use the SEPs. The Unit Planners provided for each unit give a big-picture view of the focus SEPs of each concept in that unit. This view allows teachers to see which SEPs will be targeted across the unit, showing where the materials provide opportunities for students to develop, practice, and demonstrate mastery of the SEPs

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

- Science Techbook for Texas is intentionally designed to provide multiple opportunities to connect overarching concepts using the recurring themes. The Grades 6–8 Program Guide includes TEKS alignment and the recurring themes represented throughout the curriculum. The materials present science themes in the Concept Lesson Planner and in the Overview. For example, the grade 7 unit, “Matter and Solutions,” introduces the theme of Scale, Proportion, and Quantity.
- Materials provide opportunities for students to use recurring themes in making connections between and within overarching concepts. For example, in the Chemical Formulas concept (Unit 1: Matter and Solutions > Concept 1: Chemical Formulas > Lesson 1: Observing CO2 and CO), students are introduced to the RTC of Scale, Proportion, and Quantity to decide if their perspective of compounds like carbon dioxide and carbon monoxide will be similar or different at different scales. They then develop a deeper understanding of this RTC throughout the concept as they investigate how the ratio of atoms in molecules determines the chemical identity and properties of compounds and elements. In the Describing Motion concept (Unit 2: Motion and Energy > Concept 1: Describing Motion > Lesson 1: Observing Scientists Measuring the Speed of Sharks), students return to the RTC of Scale, Proportion, and Quantity in order to understand how marine scientists measure the speed of sharks. Across the concept, they develop their skills and knowledge about how quantities are measured and related in order to

describe the motion, speed, and velocity of objects. In the Solar System Properties concept, students apply their understanding of Scale, Proportion, and Quantity to describe the scalar properties of objects in the solar system (Unit 3: Dynamic Earth and Space > Concept 4: Solar System Properties > Lesson 1: Observing Objects in the Solar System). As they work through the lessons in the concept, they practice applying this RTC to develop a more complete and accurate picture of the solar system and the mind-boggling scales, proportions, and quantities that characterize its objects.

- The materials include opportunities for students to revisit recurring themes. In grades 6–8, students see how structure is related to function. Using this theme in grade 6, students study cell theory and the specialization of cells. In grade 7, students investigate how cells are part of an organization that makes up the human body. Students explore how cells can protect against infectious diseases. In grade 8, students further connect this learning with the investigation of cell parts and their functions.

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 develop students' content knowledge and skills appropriate for the concept and grade level as outlined in the TEKS. The materials provide opportunities for students to conduct investigations for at least 40% of instructional time to support instruction in science standards. The Table of Contents allows teachers to see the systematic development of lessons as outlined in the TEKS. Teachers can view Unit Resources, which includes a Standards Alignment, to see where each concept is found within a lesson.
- 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. Designed to build student understanding of the scientific concepts, each concept contains a series of 5E lessons broken into learning activities that follow a logical progression. For example, each concept starts with an Engage lesson, where students encounter a real-world phenomenon and develop initial models or explanations. In the Explore section, students engage in various activities and experiences to deepen their understanding of core concepts, revising their models and explanations along the way. The Explain lesson involves students preparing a final model or explanation supported by evidence and scientific reasoning. In the Elaborate phase, students connect and apply scientific ideas to real-world experiences and STEM careers. Finally, in the Evaluate phase, students demonstrate their understanding through summative assessments.
- In Science Techbook for Texas, the materials support teachers in developing students' conceptual understanding through the use of scientific and engineering practices and recurring themes and concepts. The program was intentionally designed so that students build content knowledge and skills by using SEPs and RTCs, allowing them to connect knowledge across concepts and make connections to real-world applications. Alignment to the identified TEKS is found in the first section of teacher lesson planning materials. Through hands-on lessons and virtual investigations throughout the course, students regularly address the SEPs of planning and conducting investigations by discussing or identifying variables and carrying out experiments and investigations. They address the SEP of developing and using models and constructing explanations through all Engage and Explain lessons of the 5E learning cycle. They practice recording and analyzing data in every hands-on lesson and interactive lesson.
- Additionally, RTCs are systematically introduced in every Engage lesson, where students are introduced to the concept-level phenomenon, then revisited again in the Explain lessons in

conjunction with the core ideas. The teacher support in these lessons guides teachers to develop students' content knowledge and skills through discussion prompts, differentiation callouts, and misconception callouts. The instructional design of this program authentically embeds the SEPs and RTCs into the learning cycle, and the lesson planning teacher notes for each lesson provide teachers with the guidance needed to support student sense making.

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.

- Materials include sufficient opportunities, as outlined in the TEKS, for students to ask questions, plan, and conduct classroom, laboratory, and field investigations, and engage in problem-solving to make connections across disciplines and develop an understanding of science concepts. For example, grade 7 materials provide regular opportunities for students to raise questions about phenomena. In a lesson about “Reproduction,” the materials guide students to observe the phenomenon of starfish reproduction and develop a driving question board of questions they would need to know to figure out how this phenomenon takes place. In a grade 7 unit about “Geologic History,” the materials guide students to complete the lesson “Investigating the Changing Continents.” The materials guide students to predict how Pangaea looked millions of years ago. The materials offer investigations throughout each unit to increase students’ understanding of science concepts.
- Hands-on learning is a foundational component of Science Techbook and authentic science learning experiences. Students investigate scientific questions and phenomena through a variety of hands-on lessons in each concept. These experiences provide students opportunities to plan and conduct experiments, define and identify variables, develop models using manipulatives, analyze authentic data sets, and collect data to answer questions about phenomena. These instructional opportunities encourage students to use skills from other disciplines, such as ELA and Math. Hands-on lessons and STEM Projects also include experiences that allow students to apply the steps of the engineering design process to solve real-world problems, guiding them to make cross-curricular connections.
- The materials include a variety of hands-on lesson types, including step-by-step procedures for students to follow or more open-ended lessons that support students in developing their own procedures for their investigations. This program was intentionally designed to support student inquiry and questioning opportunities, followed by investigations and STEM projects to answer questions and allow students to make connections to real-world contexts. For example, within a grade 7 unit on “Motion and Energy,” the lesson “Investigating Marbles in Motion” guides students to use a handout to plan, record, and conduct their investigation to measure and graph the motion of an object over time. In a grade 7 lesson, “Designing an Ice Robot,” students design, build, and test a solution to create smooth ice on an ice rink, which requires an understanding of how forces affect motion.
- The materials provide repeated opportunities for students to use grade-level appropriate scientific and engineering practices across various contexts throughout the course. For example, the Unit Structure and Pacing Guide, found within Unit Resources, provides teachers a scope and sequence of lessons that indicates when hands-on activities and investigations will occur in the unit.

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Indicator 2.2 Grade 7

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). Students examine phenomena and develop content knowledge as they work to construct explanations of the phenomena.
- The materials embed phenomena and problems across all lessons by including an authentic phenomenon in Lesson 1 for every concept within every unit. In a grade 7 lesson about Geologic History, the materials guide students to make observations and create a student question board based on what they have observed. The materials then scaffold the content, guiding students to make an initial explanation for how trilobites ended up at the top of Mt. Everest. The materials further guide students to continue building and developing their knowledge through hands-on activities, interactive computer modules, and readings.

- The materials provide intentional opportunities for students to develop, evaluate, and revise their thinking as they engage in phenomena and define and solve problems. After the students examine the phenomenon in Lesson 1, the materials then guide the students to reconsider the phenomenon in the exploration part of the lesson (Lesson 2) through a hands-on investigation. The materials then return students to their initial observations and explanations after they have acquired new science concepts during the Phenomenon Check-In portion of the lesson.

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

- The materials provide opportunities for students to leverage knowledge and experiences related to the phenomena. Teachers have guidance provided in the lesson planning section of each unit to help students recall previous knowledge. Every concept and lesson included in Science Techbook for Texas, Grade 7, begins with a "Setting the Purpose" section, designed to allow teachers to leverage and solicit students' prior knowledge of key science ideas before the main learning objective of the lesson. In addition to accessing prior knowledge for every lesson of every concept, the first lesson in each concept, the Engage lesson, expects students to discuss with one another their prior knowledge and experience with the presented phenomenon. Often students' prior knowledge and experiences are solicited through discussion opportunities and or small group strategies. For example, in a grade 7 lesson, "Matter and Solutions," "Setting the Purpose" directs teachers to "Show students a carbon monoxide detector and ask them why we might need to place these in homes and classrooms. Then have them turn to a partner and share what they thought. Have a few students share what they and their partner discussed."
- Across all concepts, common, research-based misconceptions are included in teacher-facing lesson planning sections. Most of these misconception teacher notes include an explanation or practical strategy to support students in overcoming barriers to conceptual development. In the grade 7 lesson, "Investigating Other Body Systems, the materials guide the students to construct a model of several body systems and how they work together. The materials provide guidance for the teacher to address potential misconceptions; "Students may not recognize that all models or analogies have limited usefulness. The analogies that students propose in this activity will have both strengths and limitations. Make sure students recognize and discuss the limitations of a city model for the human body as they respond to the discussion prompts."
- The materials provide additional student and teacher background knowledge in the Unit Resources section, "Background Knowledge." The materials include what teachers need to know and what students should know, and the misconceptions they may have. While there is information provided to help address the most common misconceptions in each Lesson Planning document, these are dispersed throughout the lessons. It would be helpful to the teacher to have a misconceptions document at the beginning of each Concept that identifies the most common misconceptions and how to address them from the very beginning because students may address a misconception before it is brought up in the lesson planning document.

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

- The materials clearly outline for the teacher the scientific concepts and goals behind each phenomenon or engineering problem. The Unit Planner for each unit provides a rationale for the phenomena, concept objectives, and key vocabulary. Each Concept section includes a

"Teacher Overview." For example, in a grade 7 lesson, "Chemical Formulas," the materials provide teachers with a list of objectives that students should be able to complete by the end of the lesson, such as "make observations, ask questions, and construct initial explanations about the properties of carbon dioxide and carbon monoxide, develop and use models to compare atoms, molecules, elements, and compounds, and investigate how atoms combine to form elements and compounds."

- The materials clearly outline the scientific concept objectives and goals behind each phenomenon for the teacher at the lesson level. Each lesson includes a "Lesson Planning" section which includes the goals and sets the purpose for the lesson. Each lesson includes student objectives.
- The materials identify the student learning goal(s) behind each phenomenon or engineering problem. For example, in a grade 7 lesson, "Observing CO_2 and CO," the materials list the student objectives as "I can make observations, ask questions, and construct initial explanations about the properties of carbon dioxide and carbon monoxide."

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Indicator 3.1

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

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

Meets | Score 6/6

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

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

Evidence includes but is not limited to:

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

- Materials connect new learning to previous and future learning within and across grade levels. Materials provide an overview of the vertical alignment, which can be found in the *6-8 Program Navigation and Vertical Alignment Guide*. For example, materials scaffold the concept of Matter across grades 6 through 8. In the grade 6 Matter and Properties unit, Identifying New Substances concept, the materials focus on TEKS 6.6.E "Identify the formation of a new substance by using the evidence of a possible chemical change, including production of a gas, change in thermal energy, production of a precipitate, and color change." In the grade 7 Matter and Solutions unit, Physical and Chemical Changes concept, the lessons build upon the grade 6 knowledge and focus on TEKS 7.6.C, “Distinguish between physical and chemical changes in the matter." In the grade 8 Matter and Reactions unit, Chemical Reactions concept, the materials focus on TEKS 8.6.B, “Use the periodic table to identify the atoms involved in chemical reactions.” and 8.6.E, “Investigate how mass is conserved in chemical reactions and relate conservation of mass to the rearrangement of atoms using chemical equations, including photosynthesis."
- Materials guide students to connect their knowledge and skills within units in their grade level. For example, in the grade 7 Life Systems and Processes unit, Concept 1: Body Systems, students

begin observations on how our body helps heal a cut. At the beginning of the lesson, students observe how our body systems must work together to allow the body to function. Throughout the lesson, students review the structure and function of cells, the organization within the human body, and how systems work together. At the end of the unit, students are asked to revisit their original statement on the phenomena and revise and edit it if needed.

- Materials present content in a way that builds complexity within and across units. Materials present each concept in the 5E format. Each concept begins by introducing a real-world phenomenon to engage students and encourage them to ask questions. This is done through hands-on investigations, images, data sets, or multimedia in the Engage lessons. As students progress, they revisit the phenomenon to deepen their understanding. In the Explore section, students engage in various activities such as hands-on investigations, digital interactive experiences, multimedia analysis, and integrative literacy learning. In the Explain phase, students provide explanations supported by evidence and scientific reasoning to explain the phenomenon. The Elaborate phase involves making connections and applying concepts to real-world experiences, including STEM careers and projects. The Evaluate section consists of summative assessments that allow students to apply their knowledge. For example, in the grade 7 Dynamic Earth and Space unit, Gravity and Space concept, materials engage the students with a phenomenon video showing the planets in orbit around the sun. Materials then provide students the opportunity to explore these ideas with a hands-on investigation of the role of gravity in the solar system. Materials guide students in the *Explaining Planets Orbiting the Sun* lesson to revisit their initial observations, revise their models, and reflect on and describe them. The Elaborate lesson, *Careers and Gravity,* has students learn about how gravity in space applies to STEM careers. Finally, in the Evaluate section, students summarize the key concepts that they have learned.

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

- Materials include a progression of concrete and then representational before abstract reasoning when presenting concepts. In the grade 7 concept Physical and Chemical Change, the lesson *Observing the Reaction in a Bag* provides students with a concrete phenomenon to investigate and develop questions related to physical and chemical changes in experiments. Students then conduct concrete, hands-on investigations to understand the phenomena better. Materials then guide students to revisit and revise questions. Materials repeat this for each concept until the phenomena are revisited and revised a final time. The extension lessons guide students to investigate how solubility and temperature are related, providing additional opportunities for deeper understanding.
- Materials ensure students experience a phenomenon or problem before utilizing models as a tool for reasoning. Specifically, in each unit, materials include a hands-on activity within the lesson sequence. This hands-on activity happens before students complete further investigation of the phenomena. The grade 7 Life Systems and Processes unit, Concept 2: *Classifying Organisms*, guides students to begin the lesson with observation on how scientists name fungi. Students then ask questions about the phenomena and create a statement on why the phenomenon is occurring. Later in the lessons, students build on the knowledge of classification and how scientists name new fungi. This allows for lessons to be scaffolded and allows for a deeper understanding of the concepts.

- Materials sequence instruction in a way that activates or builds prior knowledge before explicit teaching occurs that allows for increasingly deeper conceptual understanding. Materials present students with a phenomenon and guide students to share personal experiences and ideas and then engage in inquiry-based exploration before there is any explicit teaching. For example, in the grade 7 Matter and Solutions unit, Chemical Formulas concept, a lesson focuses on TEKS 7.6.A “Compare and contrast elements and compounds in terms of atoms and molecules, chemical symbols, and chemical formulas” and 7.6.B “Use the periodic table to identify the atoms and the number of each kind within a chemical formula.” In Lesson 1, the materials present the students with videos about carbon dioxide and carbon monoxide and ask the students to make observations, develop a driving question board, and create an initial model of the phenomenon. In Lessons 2–3, materials provide the students with opportunities to explore the concepts behind the phenomenon they observed in the first lesson. Materials state the objectives for Lesson 2 and Lesson 3 as "I can develop and use models to compare atoms, molecules, elements, and compounds" and "I can investigate how atoms combine to form elements and compounds." In Lesson 4, students analyze their prior experiences and data gathered in the prior lessons to formulate scientific ideas. Students have those ideas backed up with explanations in this portion of the materials. Materials state the objective for Lesson 4 as: "I can explain the differences among atoms, elements, and compounds."

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

- Materials clearly provide instruction in grade-specific core concepts. Each concept in each unit consists of several lessons that follow the 5E (Engage, Explore, Explain, Elaborate, Evaluate) instructional model. This allows for a clear presentation of grade-level-specific core concepts and a meaningful integration of Recurring Themes and Concepts (RTCs) and Science and Engineering Practices (SEPs).
- Materials clearly provide instruction in RTCs and SEPs. In the first lesson of each concept, materials present the students with a phenomenon. Students are prompted to think about the phenomenon using one of the recurring themes. For example, in the grade 7 Life Systems and Processes unit, the Body Systems concept guides students to use the recurring theme of structure and function to think about a healing cut. In that same lesson, materials ask the students to engage in the SEP of modeling.
- Materials accurately present core concepts, RTCs, and SEPs. Across lessons, units, and grade levels, materials are free from scientific inaccuracies. Materials present current scientific content that reflects the most widely accepted explanations. For example, in the grade 7 Dynamic Earth and Space unit, the lesson *Plate Tectonics and the Earth’s Surface* uses the concept of hot spots to explain why some volcanoes occur in places not associated with plate boundaries, using the Hawaiian Islands and Yellowstone National Park as examples.

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

- Materials include guidance for the teacher on specific learning targets for each concept, located in the Teacher Overview section. For example, in the grade 7 Matter and Solutions unit, Concept

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1: Chemical Formulas lists the Concept Objectives: “Make observations, ask questions, and construct initial explanations about the properties of carbon dioxide and carbon monoxide. Develop and use models to compare atoms, molecules, elements, and compounds. Investigate how atoms combine to form elements and compounds. Explain differences among atoms, elements, and compounds. Revise an explanation of chemical compounds based on evidence gathered from investigations. Describe how chemical formulas apply to STEM careers. Summarize key ideas about chemical formulas.”

- The Scope and Sequence in the Grades 6-8 Program Guide lists the TEKS addressed and their sequence for each grade. Materials include guidance for the student on specific learning targets for each lesson. Each lesson includes a Student Objective for students to revert back to while going through the material. For example, in the grade 7 unit Dynamic Earth and Space, the lesson *Plate Tectonics and Earth’s Surface* begins with the Student Objective, “I can explain the effects of plate motion on Earth’s surface.”
- Materials include a Vertical and Horizontal Alignment Guide that defines the boundaries of the main concepts that students must master for the grade level or course. This document helps teachers know where the students are coming from and where they are going in their learning.

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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.	PM
3	Materials explain the intent and purpose of the instructional design of the program.	M

Partial Meets | Score 3/6

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

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

Evidence includes but is not limited to:

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

- Materials include guiding documents that support teachers in understanding how concepts connect across lessons and units within the grade level. Grade 7 materials, for example, provide a Unit Planner for each unit that provides a horizontal guide of concept connections. Materials also provide an overview of the vertical alignment, which can be found in the 6-8 Program Navigation and Vertical Alignment Guide.
- The program is intentionally designed to provide both horizontal and vertical articulation of the grade-level content, recurring themes and concepts, and science and engineering practices, supporting teachers in understanding how new learning connects to learning from previous grades. Materials include a Vertical and Horizontal Alignment Guide that supports teachers in viewing the full scope and sequence across all grade bands (elementary, middle school, and high school.)
- Materials include general background knowledge for teachers regarding the concepts they are teaching. Search functionality, found in the top navigation bar within the product, allows for a teacher to search for additional support to build their own subject knowledge. Filters by grade band allow teachers to look for topics below and above their students' grade level.

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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 include background information for teachers that provides explanations and examples of science concepts. For example, a Background Knowledge document is included in the Unit Resources section of each unit for teachers who may need to build their own subject knowledge. This document provides both teacher and student background information about the concepts within the unit.
- While the publisher has provided some lessons that include misconceptions, they are not included in all lessons within the unit. In addition, there is not adequate guidance for teachers and students to address potential areas of misunderstanding. Materials identify some common grade-level misconceptions students may have about some science concepts. However, materials do not address these misconceptions or barriers in every lesson, and they are not revisited throughout the unit as the potential area of misconception is revisited. Materials do not include guidance for the teacher on how to facilitate discussion about misconceptions when student explanations are based on incomplete or incorrect information. For example, in grade 7 lesson, *Monster Truck Pull*, the misconception section states, "Students may think that when balanced forces are applied to an object, the object must not be moving. Explain to students that, as described by Newton's first law of motion, balanced forces cause no change to an object's motion. An object at rest will remain at rest, but an object in motion will retain its same motion until a non-zero net force, or set of unbalanced forces, acts upon it. Students may think that balanced forces must be applied the same way, such as a monster truck pulling on a rope. Explain to the students that two balanced forces may be any combination of contact or noncontact forces, as well as pushes or pulls. In theory, the pull of one monster truck could be balanced by the push of another truck. If needed, have the students think about what would happen to the marble if two students blew on the marble with two different straws pointing in two different directions." Materials provide no guidance on learning experiences to clarify the misconception.
- Materials do not support teachers in developing their own understanding of more advanced, grade-level concepts. While the search functionality allows teachers to search for additional grade bands, it can only be utilized at the unit level, not at lesson levels. There are no linked additional resources for the teacher to deepen their own understanding of concepts and material.

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

- Materials provide a purpose or rationale for the program's instructional design, highlighting its key features. For example, *The Grades 6-8 Program Guide* explains the rationale of the structure of Units, Concepts, and 5E Framework Lessons. "Units, concepts, and lessons are designed to pique student interest and scaffold acquisition of specific scientific ideas as students learn about the world in which they live."
- Teacher guidance materials explain the purpose of beginning each unit with a phenomenon. For example, the *Grades 6-8 Program Guide* states, "All concepts begin by focusing on real-world phenomena. These phenomena pull in students and give them a reason to explore the scientific investigations in the concept. Students make observations, ask questions, and develop explanations or models of the phenomena. As they gather evidence during their investigations,

they find answers to their questions and revise their models or explanations. Ultimately, the phenomena increase coherence and make science relevant to students' lives."

- Materials provide a framework explaining the main intent or goals of the program. Materials provide a Program Guide that thoroughly describes the program's instructional approaches and references the research-based strategies present in the materials. For example, the *Grades 6-8 Program Guide* describes:
    - Use of the 5E Framework
    - Leveraging Phenomenon-Based Learning
    - Role of hands-on learning
    - Role of the science and engineering practices
    - Role of recurring themes and ideas
    - Integrating grade-level content and skills, SEPs, and recurring themes and ideas
    - Role of habits of discussion and productive struggle

Discovery Education Science Techbook for Texas Grade 7

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.

- Materials define sensemaking and identify specific sensemaking behaviors of students. The *Grades 6-8 Program Guide* provides teachers an explanation as to why there has been a switch from simply explaining the science concepts to students to allowing the students to examine and explain real-world phenomena on their own. "When phenomena are carefully selected to be relevant to students, the phenomena spark students' curiosity and provide a reason for them to engage in the learning as they make sense of how and why the phenomena occur. Students build their understanding of science ideas through the process of developing and revising explanations and models."
- Materials provide students with a variety of ways to learn each concept. Students can make observations, complete hands-on activities, read corresponding articles about the phenomena, and apply and analyze the concept. For example, in the grade 7 Dynamic Earth and Space unit,

Concept 3: Water Resources guides students to think about why there has been a fish kill in the Mississippi River Delta. Materials provide students with some background knowledge of what a fish kill is and ask them to make observations and list possible cause and effects for this particular fish kill; students then make an initial claim (with supportive evidence). Students complete an investigation by creating a watershed with paper, markers, and water. In the next lessons, materials provide students with readings and videos that help them solidify their claim. Materials guide students to use this knowledge and apply it to real-world phenomena.

- Materials consistently provide learning activities that support students' meaningful sensemaking. In the Dynamic Earth and Space unit, the grade 7 lesson *Prove They Move* states the Student Objective "I can analyze evidence of continental drift and plate tectonics." To accomplish this, the class begins discussing how new ideas are accepted. Students complete an interactive sorting piece of evidence for continental drift and plate tectonics. Students record evidence pieces in their data table. Students then write a three- to six-sentence summary of the evidence from the theories. Students complete a check for understanding. They then evaluate the evidence and explain their thinking.

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 opportunities for students to engage in purposeful and targeted activities with grade-level appropriate scientific texts. According to the *Grades 6-8 Program Guide, "*During reading, students stop and make connections, monitor their understanding, and generate questions for sensemaking. After reading, students have opportunities to communicate, respond to, and reflect on scientific ideas from the text." For example, in the Dynamic Earth and Space unit, Lesson 4: *Evidence of Earth's History*, directs students to explain the evidence supporting continental drift and plate tectonics. Students read passages about evidence of continental drift and evidence of plate tectonics. Between each section, the materials provide students with reflection questions and ask the students to reflect and discuss. After the reading, the Techbook guides students to summarize their learning by answering two open-ended response questions. "How does the history of the theory of plate tectonics support the idea that scientific knowledge is open to change based on new ideas and evidence? How does a theory differ from a law or hypothesis in science?"
- Materials provide opportunities for students to engage with scientific texts, including activities, such as pre-reading and vocabulary, to help them develop an understanding of concepts. The materials include key vocabulary and strategies for supporting vocabulary throughout the lessons of each concept. Additionally, materials hyperlink key vocabulary terms in the interactive glossary in student-facing text and the toolbar for easy student access. The interactive glossary can be accessed by clicking on the three dots in the top right corner of the window of the course page or any concept or lesson in the course. For example, in a grade 7 lesson, *Need for Speed*, materials include three vocabulary terms hyperlinked to the interactive glossary: speed, velocity, and direction.
- Teacher materials clearly list an overview of key vocabulary terms for each unit listed by concept in the Unit Planner. For example, in the grade 7 Matter and Solutions unit, the Unit Planner identifies the key vocabulary terms for the Chemical Formulas Concept: atom, chemical formula, chemical symbol, compound, element, molecule, and periodic table.

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

- Materials provide opportunities for students to communicate thinking on scientific concepts in written and graphic modes. Materials allow students to make their thinking visible through graphic organizers and written responses. Materials provide structures to facilitate the sharing of these written forms to help students refine their thinking. For example, in the grade 7 Life Systems and Processes unit, lesson *Eating Like a Bird*, students investigate factors that affect the occurrence of traits in populations. Materials provide students with the opportunity to organize their findings and observations in a data table. In the grade 7 Motion and Energy unit, the Extension lesson *STEM Project Starter: Classroom Olympics* directs students to create an event for their group to "compete" (hopping on one foot). Materials guide students to use the digital Whiteboard to record their data. “Use the Data/Graphing Tool to design a data table that lists all the events in the class. You will need to record times for each person on your team for each event.” Materials then direct students to “Gather each team’s average speed for the event your team designed. Use these data to make a bar graph of the class results for your event. Upload your graph for your teacher to assess and share your graph with your classmates.”
- Materials allow students to make scientific drawings of their observations or records of evidence related to scientific ideas to capture and share their understanding of scientific concepts. For example, in the grade 7 lesson *Investigating Forces on Marbles*, within the Forces and Energy unit, materials ask students to “Draw and label all the forces acting on the marbles in each scenario. Record if all the forces on the marbles are balanced or not.”

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

- Materials provide authentic student engagement and perseverance of concepts through productive struggle while acting as scientists and engineers. Students are expected to use evidence to support hypotheses and claims. When conducting investigations, students return to their predictions after analyzing their data to determine if the data supports their claims. They then construct and present developmentally appropriate written and verbal arguments that justify their data and observations using evidence they acquired. For example, in the grade 7 Matter and Solutions unit, the lesson *Investigating Aqueous Solutions* asks students to investigate the effects of dilutions on a solution and its concentration. Materials guide students to draw models of their investigations, develop an explanation of their model, and support their explanation with evidence.
- 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 phenomena or problem occurs. In Engage, students are expected to act as scientists and engineers by observing real-world phenomena and design challenges. Students consider a driving question that relates to the phenomenon and is unable to be answered prior to completing the concept lessons. Students return to analyzing the phenomenon throughout the concept with phenomenon check-ins. Finally, in the Explain portion, materials guide students to use their collected evidence to support a scientific

explanation. For example, in the grade 7 Dynamic Earth and Space unit, Concept 4: Solar System Properties, the Techbook includes the following:

- Lesson 1: Students make observations of objects in the solar system, ask questions about them, and construct an initial explanation about them. Students develop an initial explanation of the phenomenon.
- Lessons 2–4: Students engage in activities that build aid in their sensemaking regarding the phenomenon.
- Lesson 5: Students participate in a "phenomenon check-in" and are asked, "Now that you have explored the sun, its planets, and their moons, it's time to revisit the questions you and your classmates came up with on the Student Question Board."
- Lessons 5–7: Students engage in activities that build aid in their sensemaking regarding the phenomenon.
- Lesson 8: Students make final revisions to their explanations of the phenomenon based on evidence gathered from investigations.

Materials create transfer opportunities for students to take what they have learned and use it flexibly in new situations. In the grade 7 Motion and Energy unit, Concept 2: Changes in Motion first provides students with a brief explanation of forces. Students then conduct an investigation where they blow marbles across a table and record the forces on the model and if they are balanced or unbalanced. In the next lesson, with the same concept, students apply the learned information to a virtual activity about monster truck pulls and continue to make force diagrams. Students then explore the concepts of forces in space in the next lesson. Materials give students additional opportunities to revisit the phenomenon questions that they had previously answered

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Indicator 5.1

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

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

- Materials provide opportunities for students to develop how to use evidence to support their hypotheses and claims by using the 5E model of instruction. Materials present students with a phenomenon (or an engineering problem) in the Engage lesson of every Concept to produce an initial explanation (or a solution to the problem). In the following Explore lessons, students construct new knowledge. In the Explain lesson of each concept, materials allow students to use evidence to support their claims in an effort to improve their initial explanations based on what they learned throughout the concept. For example, in the grade 7 Motion and Energy unit, in the concept Describing Motion, the Explain lesson guides students to produce an explanation (their claim) to the driving question that was developed from the phenomenon (how scientists measure the speed of a shark based on evidence gathered from investigations?) "Evaluation Criteria" in the student materials ask students to use evidence to support their claims using Claim-Evidence-Reasoning criteria.
- Materials specifically prompt students to use evidence when supporting their hypotheses and claims. In Explain, materials guide students to provide a final explanation of the phenomenon. Students then review and reflect on the observations and evidence they have collected during

the Explore parts of the lessons and revise their explanations. For example, within the grade 7 Matter and Solutions unit, the lesson *Explaining Sugar Dissolving in Tea* prompts students: "Now that you have learned more about dissolving matter, write a final explanation for this phenomenon." In the criteria for success, materials provide students with the following guidance for on-target evidence: "identifies valid and reliable evidence from multiple sources; may include models to support the explanation."

- Materials provide prompts for students to utilize evidence in their claims. In the grade 7 lesson *Plate Tectonics and Earth's Surface,* within the Dynamic Earth and Space unit, students read articles and watch videos to help support how plate boundaries impact Earth's features. Once complete, students answer discussion questions within a group or with a shoulder partner. Students then create a six-word story to describe what they learned about the effects of plate tectonics. At the end of the lesson, students reflect on the questions on the student question board; materials suggest that they utilize the data gathered to revisit and revise the questions.

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

- The Techbook includes embedded opportunities for students to develop and use vocabulary after having a concrete or firsthand experience to which they can contextualize new terms. For example, in grade 7, students explore solutions in the Dissolving Matter concept within the Matter and Solutions unit. In the first two lessons, students engage in activities in which they observe and describe solutions. In the third lesson, materials introduce the terms solute, solvent, and concentration. Students engage in a reading activity and watch a video in which they can experience and contextualize the new terms. Materials then prompt students to "Think about the information you just read and discuss the following: What are the parts of a solution? Why is water called the universal solvent? Why are solutions also called homogeneous mixtures?" Finally, in the What Did You Figure Out section, students use the new vocabulary and evidence from the investigation to complete a closed reading paragraph.
- Materials present scientific vocabulary using multiple representations. The lessons have vocabulary words in color and hyperlinked to the glossary link for the words. The glossary includes audio pronunciation, written definitions, key context, real-world images, and video explanations of the words used in context. Some words also include animations. Students can also access the entire glossary using the three-dot drop-down menu on the upper right corner of the screen.
- Materials allow students to use scientific vocabulary in context. Within the grade 7 Matter and Solutions unit, the lesson *Bonds that Bind* prompts students to investigate how atoms combine to form elements and compounds. Students watch a video and complete an interactive activity building molecules. Students then use these two vocabulary words (element and compound) to identify chemical formulas. They continue using these two vocabulary words by completing a Venn Diagram comparing the similarities and differences between elements and compounds.

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 develop how to engage in argumentation and discourse. Research-based SOS strategies found in the program expect students to share their ideas with one another as they synthesize and deepen their understanding of the grade-level content. For example, in the grade 7 lesson *Bonds that Bind* within the Matter and Solutions

unit, students engage in the SOS strategy called Get Venny-Y With It. “Use this strategy with students to compare ideas and information. Encourage students to identify as many differences and similarities as they can to deepen their understanding. Tell students that for every similarity, they should be able to record a corresponding difference and vice versa. You may have students compare their diagrams with another group or consolidate student ideas into a class Venn diagram.”

- Materials integrate argumentation and discourse within stages of the learning cycle. Materials guide students to conduct grade-appropriate academic discussions to analyze data and evidence to build their conceptual understanding of each concept. Across the program, these opportunities are highlighted by discussion prompts, as well as additional teacher questioning prompts found in the teacher materials. Materials introduce students to constructing an argument for their own interpretation of the phenomena they observe. Materials provide instructional support to help students go beyond simply making claims. For example, in the grade 7 Matter and Solutions unit, the lesson *Dissolution Rates* provides students with opportunities to engage in discourse at four different points in the lesson. Materials provide the following question prompts:
    - “Study the photo of the dissolving solids as you discuss your ideas about the following questions: How can you increase the time it takes for a solute to dissolve? What happens at the molecular level when a solute dissolves? In the image, what do you think helps the tablet dissolve rapidly?
    - Think about the information you read and discuss these questions: What happens at the molecular level when a solute dissolves in a solvent? Why does stirring a solution increase the rate of dissolving?
    - Think about the information you read and discuss these questions: How does temperature affect the rate of dissolving? How does surface area affect the rate of dissolving?
    - Discuss the following ideas in your diagram: How does the collision of molecules help explain the rate at which a solute dissolves? How does adding heat to a mixture increase the rate of dissolution? How does agitation work differently from increasing temperature? What does crushing a solute do to speed up how quickly it dissolves? A scientific model intentionally focuses on key aspects of an event or system. What are some strengths and limitations of the model you drew?”
- Materials offer teachers guidance on when discourse should occur. In the grade 7 Matter and Solutions unit, the lesson *Investigating Atoms and Molecules* guides students to complete an investigation by building different models of given chemical formulas. The Lesson Planning document suggests teachers “Begin by asking students to share an atom they know. Tell students that they will use models of atoms to build particles of matter in the lesson. Ask students to read the introductory text and discuss their prior knowledge. Let them grapple with questions because they will improve their ideas during the lesson.” During the analysis section of the lesson, materials suggest that teachers allow students to explain and discuss any differences they have between other groups; this leads to a whole class discussion. This part of the lesson allows for argumentation and debate about any differences between groups.

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Grade 7

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

- Materials provide instruction for how to construct and present a verbal or written argument to problems using evidence acquired from learning experiences. The Techbook uses the 5E model of instruction to present students with a phenomenon or an engineering problem in the Engage lesson of every concept. In the following Explore and Explain lessons, students construct new knowledge. In the Evaluate lesson of each concept, materials guide students to construct developmentally appropriate written and verbal arguments that justify explanations of phenomena based on what they learned throughout the concept. For example, in the grade 7 Matter and Solutions unit, the lesson *Explaining Sugar Dissolving in Tea* prompts students: "Now that you have learned more about dissolving matter, write a final explanation for this phenomenon." In the criteria for success, materials provide students with the following guidance for on-target evidence: "identifies valid and reliable evidence from multiple sources; may include models to support the explanation."
- Materials allow students to discuss and write about the evidence they have gathered supporting the phenomena in question. For example, in the lesson *Habitable Earth*, within the grade 7 Dynamic Earth and Space unit, students gather information through readings and videos about what makes planets habitable. After watching a video, materials suggest giving students time to have a discussion with a partner about prompted questions before reading an article about the topic. After reading, materials ask students more questions about what makes the moon and other planets uninhabitable; they showcase their knowledge in a data table. Under the *What Did You Figure Out?* section, students write a six-word story to describe what they learned about properties that make life possible on planets. At the end of the lesson, materials prompt students to revise their initial claims.
- Materials provide criteria for developmentally appropriate arguments to explain a phenomenon or defend a solution to problems using evidence acquired from learning experiences. Materials provide embedded rubrics or criteria for success throughout the lessons. These rubrics include detailed criteria for students when engaging in arguments from evidence. For example, in the grade 7 Matter and Solutions unit, the lesson *Explaining Sugar Dissolving in Tea* includes a rubric for students with the "on-target" scale as follows:
    - "Claim: states an answer to a question or scientific explanation of the phenomenon that represents the relationships between variables or components of the phenomenon
    - Evidence: identifies valid and reliable evidence from multiple sources; may include models to support the explanation
    - Reasoning: shows how or why the evidence supports the claim and describes why the evidence is adequate or not adequate to support the claim."

Discovery Education Science Techbook for Texas Grade 7

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

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.

- Materials provide teachers with possible student responses to questions and tasks. Teacher materials provide correct responses for all prompts, including discussion prompts and formative and summative assessments in the program. For example, in the grade 7 Life Systems and Processes unit, the Lesson Planning document for the lesson *Investigating Matter Cycles in Ecosystems* provides the teacher with prompts and possible student responses. "Develop three true statements and one false statement about matter, food webs, and ecosystems. You may write your statements in any order, but be sure to remember which one is not true. Student responses will vary. Sample response: 1. Producers transfer matter to decomposers. 2. Producers transfer carbon dioxide to consumers. (False) 3. Decomposers get the matter they need from all other organisms. 4. Some consumers can be both secondary and tertiary consumers."
- Materials provide teacher responses to possible student responses, including how to build on students' thinking. Each Lesson Planning document provides information in the Misconceptions and Differentiation sections. This information provides some teacher responses to student thinking and responses. Formative assessment items, found in the Check for Understanding section in Explore lessons, provide scaffolded feedback directly to students when they indicate

incorrect or partially incorrect responses. For example, within the grade 7 Matter and Solutions unit, the Check for Understanding portion of the lesson *Investigating Atoms and Molecules* provides the following feedback when students select incorrect answers: "Not quite. Think carefully about what a chemical formula tells you about the number and types of atoms."

- Materials provide support for teachers to deepen student thinking through questioning. Teacher materials include questions that deepen student thinking at various points across the lesson. For example, in the grade 7 Matter and Solutions unit, the lesson *Investigating Atoms and Molecules* includes in the Setting the Purpose section of the Lesson Planning document the following directions for the teacher:
    - "Begin by asking students to share an atom they know. Tell students that they will use models of atoms to build particles of matter in the lesson. Ask students to read the introductory text and discuss their prior knowledge. Let them grapple with questions because they will improve their ideas during the lesson.
    - Discuss your ideas about the following questions: What is a molecule? Students' responses may vary. Sample Response: A molecule is two or more atoms bonded together. How is an element different from a compound? Elements are made of one type of atom, while compounds are made of different types of atoms.
    - Use this opportunity to discuss why scientists use models in their practice. Ask What is a scientific model? A scientific model is a representation of an idea, process, or thing in the natural world. Why do scientists make models? Scientists use models as tools to study or explain ideas about things that are too small, too large, or invisible to human eyes."

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

- Materials have built-in scaffolding for concept and vocabulary development in the design of the learning sequence by using the 5E model of instruction. All concepts start with Engage, a phenomenon (or an engineering challenge) that provides opportunities to elicit students' prior knowledge. Carefully sequenced Explore activities allow students to develop new vocabulary in the context of the scientific concept. Students then have multiple opportunities to use this new vocabulary to explain the phenomenon and answer other emerging questions. For example, in the grade 7 Motion and Energy unit, the Describing Motion concept introduces students to a phenomenon (using a video of a shark swimming to describe its speed.) Students then conduct several investigations where they develop new vocabulary (average speed, constant speed, direction, displacement, instantaneous speed, slope, speed, velocity, x-axis, y-axis) in the context of changes in motion. They use these new vocabulary words in explaining the phenomenon (Explain and Evaluate lessons) and answering emerging questions (in the Elaborate lesson.)
- Materials provide embedded supports for the teacher in how to introduce and scaffold students' development of scientific vocabulary. For example, each concept in materials begins with a Teacher Overview that previews the vocabulary that will be used in the unit. Materials include key vocabulary terms for both the student and teacher at the beginning of each concept. For example, in the grade 7 unit Matter and Solutions, the Chemical Formulas concept lists the following vocabulary terms: atom, chemical formula, chemical symbol, compound, element, molecule, and periodic table.

- Materials guide the teacher on how to support students' use of scientific vocabulary in context through instructional videos. These videos can be accessed through the Educator Support page of the product website under the Instructional Strategies section within the Vocabulary Development title. Materials include many videos providing useful guidance for teachers on supporting students in vocabulary development; for example, the video titled "Fold, Draw, Learn."
- Materials guide the teacher on how to support students' use of scientific vocabulary in context. For example, as students build a conceptual understanding of the key vocabulary throughout the concept, teacher materials indicate at the point of use when to bring in and facilitate students' proper use of academic vocabulary during the lesson. For example, in the grade 7 Lesson Planning document for *Observing CO_2 and CO*, within the Matter and Solutions unit, materials provide the following guidance for the teacher: "After students understand the science ideas involved with key vocabulary terms compound and element, introduce the terms and prompt them to continue using them as they engage with the content in this lesson."

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

- Materials provide teacher guidance on preparing for student discourse and supporting students in using evidence to construct written and verbal claims. The Educator Supports page of the product website includes guidance for facilitating this process. For example, videos in the Instructional Strategies section of the Educator Supports include various "channels" such as Cites Evidence, Summarizing, Key Ideas and Details, Inference and Predictions, etc.
- Materials provide teacher guidance for student discourse. The *Grades 6-8 Program Guide* explains the use of an icon within lessons that shows when student discourse occurs. For example, within the grade 7 Matter and Solutions unit, the lesson *Observing the Reaction in the Bag* guides students to make observations, ask questions, and construct an initial prediction about the phenomena. The Lesson Planning document guides the teacher to have students present their initial claims to each other; the students create one question about the claim and make one suggestion. The teacher then prompts student discourse by giving the following questions: "Does the explanation have a claim that is clearly stated and answers the question? What evidence was used to support the claim? Does the reasoning describe how or why the evidence supports the claim?" This discussion allows students to take feedback and revise their initial claims.
- Materials provide teacher questions for supporting student discourse and using evidence in constructing written and verbal claims. Questions push students to use evidence to support their claims in both written and spoken discourse. Students conduct grade-appropriate academic discussions to analyze data and evidence to build their conceptual understanding of each concept. Across the program, discussion prompts highlight these opportunities and additional questioning prompts in the teacher materials. For example, in grade 7, the Lesson Planning document for *Bonds that Bind,* within the Matter and Solutions unit, provides teachers with discussion prompts for students at four different times in the lesson with the following questions:
    - "Watch the video and discuss the following questions: What is an atom? What is an element? What is a compound?
    - Watch the video and discuss the following questions: What is an atom? What is an element? What is a compound?

    - Discuss how the elements in the interactive might bond together. Based on the table, which atoms have the most and least outer electrons? Would an H atom bond to another H atom? Why or why not? Which two atoms are more likely to bond together: H and Cl or H and O?
    - Discuss the following questions: How does sodium differ from other elements you observed? Why will Na and O not readily combine to form NaO? Why do the atoms in water (H_2O) form a stable molecule? Why are some letters upper and lowercase in a chemical formula? How many elements and atoms are in the molecule $C_2H_5NO_2$?"
- Materials provide guidance that teachers can use to provide feedback to students while engaging in discourse. Research-based SOS strategies included in the program expect students to share their ideas with one another as they synthesize and deepen their understanding of the grade-level content. Educator notes provide support for teachers on how to facilitate these strategies. For example, in the grade 7 Dynamic Earth and Space unit, the lesson *Evidence of Earth's History* guides teachers to "have students summarize what they learned from the discussion and reading using the Z Chart strategy. To structure student responses, ask them to identify three to five key pieces of evidence from the text that supports the idea that the continents can and have been moving." Materials then guide the teacher to use the SOS strategy of "Z Chart" with students and include a Misconceptions section for teachers to give feedback to students in response to their discourse.

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

- Materials provide teacher support and guidance to engage students' thinking in various modes of communication throughout the year. Materials provide examples of student-written and verbal responses. For example, in the grade 7 Matter and Solutions unit, the lesson *Observing the Reaction in a Bag* directs students to record their observations about the phenomenon and construct an initial explanation for what type of change is occurring during the reaction in a bag. Materials then provide the teacher guidance: "Each student should take a few minutes to share and compare their initial explanation either with a partner or a group. After each student has presented their explanation, the other students should each write down one question about the explanation and one suggestion for improvement. After all students have had a chance to share their explanations, they should review the feedback they received and decide if they want to make any revisions. You should inform students that it is also perfectly fine to incorporate ideas from other students' explanations if they like the ideas. Let them know that scientists often make use of other scientists' ideas to improve their explanations."
    - "Compare your explanation with another student. Discuss the following questions: Does the explanation have a claim that is clearly stated and answers the question? What evidence was used to support the claim? Does the reasoning use to describe how or why the evidence supports the claim?
    - Ask a student to volunteer to summarize what the class discovered and discussed regarding the phenomenon."
- Materials provide examples of student-created labeled drawings and diagrams. For example, in the grade 7 lesson *Observing Ice Melting and Sea Levels Rising*, within the Motion and Energy unit, materials direct students to observe melting ice in two different environments. "Now that you have made some observations and recorded your questions, draw a model that shows why you observed the water level rise, different rates of melting ice, and the movement of the

melted ice. Like all proper scientific models, your model should show the components in each system (land ice vs. sea ice) as well as their important properties and relationships. The rubric at the end of this lesson may be helpful as you consider what to include in your model." The Lesson Planning document provides teachers with examples of the graphic model revision and examples of written explanations.

- 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 each lesson, a teacher-only section on Lesson Planning provides guidance to facilitate student discussions and opportunities for students to share their thinking and analyze data to find solutions and develop explanations. For example, in the grade 7 Matter and Solutions unit, the Lesson Planning document for *Investigating Atoms and Molecules* provides the following guidance for the teacher:
    - Before the investigation: "Begin by asking students to share an atom they know. Tell students that they will use models of atoms to build particles of matter in the lesson. Ask students to read the introductory text and discuss their prior knowledge. Let them grapple with questions because they will improve their ideas during the lesson. Discuss your ideas about the following questions: What is a molecule? How is an element different from a compound? Use this opportunity to discuss why scientists use models in their practice. Ask: What is a scientific model? Why do scientists make models?"
    - After the investigation: "When students finish, have them compare their outcomes and propose explanations for any differences. Then facilitate a brief class discussion for groups to describe their understanding of atoms, molecules, elements, and compounds. Discuss the following questions: What is a chemical formula, and how is it helpful? What is an example of an element and compound you can make using H and O atoms? What is an example of an element and compound you can make using C and O atoms? Recall the DNA molecule from the beginning of the lesson. Which do you think would be more common in the human body: elements or compounds? Explain using evidence and key ideas from your investigation."

Discovery Education Science Techbook for Texas Grade 7

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.	PM
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

Partial Meets | Score 1/2

The materials partially meet the criteria for this indicator. Materials include some TEKS-aligned and developmentally appropriate assessment tools.

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

- Science Techbook teachers have access to various assessment tools, including Assessment Builder, which comes with a bank of pre-authored items and the ability for teachers to author their own items. However, materials do not provide teachers with pre-written diagnostic assessments to give at the beginning of the course or prior to a unit to assess students' current understanding and learning gains. Without a diagnostic assessment, it is difficult for teachers to gain a baseline understanding of students' knowledge to compare to the summative assessments to see learning gains.
- Materials include formative assessments in various formats to measure student learning and determine the next steps for instruction. They include open-ended and multiple-choice questions throughout the concepts and units, which all can serve as formative assessment probes. Materials include a “Check Your Understanding” section in each core lesson. This section provides the students with one to two questions to assess their current understanding of the content, with direct feedback to students in the materials’ digital format. For example, within the grade 6 Matter and Properties unit, in the lesson *Investigating States of Matter*, if a student submits the incorrect answer to the question “You have a balloon that changes its shape when it rests on a surface. However, the volume of the balloon always remains the same. What can be concluded about the balloon?” materials provide the feedback, “Not quite. Think about the

differences among the three balloons you tested in the activity." Materials also include a "What Did You Figure Out?" section of certain lessons, designed to help teachers check student understanding at key points during instruction. The Lesson Planning document provides expected student responses.

- Materials include summative assessments in various formats. Materials provide a summative assessment for each concept. This is called the Concept Check-in. The Concept Check-In contains approximately ten questions, and the questions vary in format and difficulty level. For example, the summative assessment for Unit 1, Concept 1: Solids, Liquids, and Gases consists of ten questions, six of which are multiple-choice questions, one short constructed response, one drag and drop, and two hot spots. While materials provide a summative assessment for each concept, the TEKS are assessed in isolation and not as a unit or semester. Materials do not include a pre-written comprehensive unit assessment to administer to students. Students of this age are capable of and should be exposed to these types of lengthier assessments, as they mirror state testing and various other district-level assessments students may take.
- Materials provide informal opportunities to assess student learning; this occurs during a lesson's Phenomenon Check-In. Students revisit their initial questions using new information they gather throughout the lesson. In the grade 7 Earth and Space Systems unit, the lesson *Types of Tides* guides students to gather information about types of tides. At the end of the lesson, the Phenomenon Check-In guides students, "Now that you have explored tides, revisit the questions you and your classmates came up with on the Student Question Board."

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

- Materials assess all of the student expectations, as outlined in the TEKS, by grade level. Materials contain a cohesive Scope and Sequence that maps out and outlines what TEKS will be taught in a specific course or grade level. Materials clearly indicate alignment in the curriculum for the grade level or subject in a manner that is easily identifiable by the teachers. This information can be accessed in several ways: The *Grades 6-8 Program Guide*, the Table of Contents for each Techbook, and each grade level's landing page includes a link to a full list of the TEKS and which concepts they appear in. At the lesson level, the Teacher Overview page for each concept and each Lesson Planning document lists the TEKS.
- Materials include detailed TEKS-based lesson plans that outline how to teach specific concepts and skills, address specific students' expectations, and provide guidance on how to assess student learning. Materials include TEKS-aligned assessments that align the curriculum standards and student expectations and allow teachers to measure student understanding and mastery of the concepts taught.
- Materials indicate which student expectations are assessed. At the end of each concept, materials include a Concept Summative assessment. Materials list the TEKS being assessed at the top of each assessment and are highlighted in blue after each assessment question.

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

- Materials include assessments that require students to integrate scientific knowledge and science and engineering practices with recurring themes appropriate to the student expectation being assessed. For example, in the grade 7 Forces and Energy unit, the lesson Investigating

Types of Forces includes a hands-on activity that provides students with opportunities to demonstrate the integration of scientific concepts and scientific and engineering practices with recurring themes and concepts through hands-on investigations and experiences. Materials guide students to investigate and identify evidence of different types of forces.

- The Techbook identifies the standards for the scientific concepts, Science and Engineering Practices (SEPs), and Recurring Themes and Concepts (RTCs) that are integrated and assessed in each lesson in the list view on every concept landing page in the course. The default setting for the unit is grid view, which is the preferred view for students, so teachers should be sure to change views to see this information.
- Materials provide summative assessment opportunities in the form of performance tasks through projects called "STEM Project Starter." These projects integrate some of the SEPs and RTCs.
- Materials include assessments that require students to integrate scientific knowledge and science and engineering practices with recurrent themes. In each concept, materials include Elaborate/Extension lessons. These lessons include summative assessments that require students to integrate the SEPs and RTCs with the scientific knowledge they obtained throughout the previous lessons. For example, in the grade 6 Matter and Properties unit, the STEM Project Starter: Thermal Expansion Joints lesson provides the teacher with the following overview: "In this STEM project, students complete a summative assessment by examining the use of expansion joints in construction and the failure of those joints. Students observe that increases in average temperature affect more than energy use to keep homes and businesses cool, but also can disrupt the movement of people and materials."

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, in the grade 7 Matter and Solutions unit, the lesson *Project: Making a Better Adhesive* provides students with the following prompt: "Read the article 'Battle of the Bounce' and answer the questions that follow. 1. Describe the structure of rubber and how that structure makes it a useful design material. 2. How was rubber modified to make it an even better material? How did rubber's properties change, and why was this considered an improvement? 3. Consider this saying: 'Some of the best inventions were accidents.' Explain this phrase using four examples of substances discussed in this article that were discovered by accident. 4. Conduct the 'Stick to It' activity at the end of the reading passage. Be sure to use four types of tape on at least four types of surfaces. Upload your data table here. Which type of adhesive was the stickiest? Use your data to explain why." Students have to apply the knowledge they gained in the unit to complete this summative assessment.
- Materials allow for students to investigate phenomena, record data, analyze data and use that data in real-world contexts. For example, in the grade 7 Motion and Energy unit, the lesson *Graphing Motion* guides students to gather information about the importance of motion graphs. Students then learn how to read a motion graph and answer questions with a partner. On completion of this activity, students write a motion story where they create their own position-time graph of a moving object. Students use the knowledge they gathered to create this position-time graph and then upload it on the whiteboard for feedback.
- Materials include assessments that require students to apply knowledge and skills to a new phenomenon or problem. Each concept features a STEM Careers lesson that allows students to dive deeper into related content standards as they learn about STEM careers and real-world

scientists and engineers that also study the same ideas they just uncovered in their classroom. These lessons have embedded assessment items that drive students to demonstrate the transfer of knowledge. For example, within the grade 7 Matter and Solutions unit, the lesson *Careers and Carbon Chemistry* directs students to describe how chemical formulas apply to STEM careers.

Discovery Education Science Techbook for Texas
Grade 7

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	Materials tools yield relevant information for teachers to use when planning instruction, intervention, and extension.	M
4	Materials provide a variety of resources and teacher guidance on how to leverage different activities to respond to student data.	M

Meets | Score 2/2

The materials meet the criteria for 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. Materials tools yield relevant information for teachers to use when planning instruction, intervention, and extension. Materials provide a variety of resources and teacher guidance on how to leverage different activities to respond to student data.

Evidence includes but is not limited to:

Materials include information and/or resources that provide guidance for evaluating student responses.

- Materials include resources that provide guidance for evaluating student responses. The *Grades 6-8 Program Guide* states, "Provided rubrics assist students in their development of explanations and models. Students and teachers utilize these rubrics to follow student self-assessments, monitor progress toward mastery, and evaluate final products. The rubrics also provide teachers with a checklist of required ideas or components to help students organize their thinking and ensure that they are showing what they have learned."
- Materials include an Assessment Administration document, located under Course Materials, that provides step-by-step guidelines to instruct teachers how to score digital assessment questions, including rubric-based constructed response questions Since rubrics are intended to be both student and teacher-facing, they are also found on the student digital page. Each rubric provides specific criteria required for a response to be awarded points.
- Materials guide teachers to look for specific components when evaluating student responses. Materials contain the correct answer(s) and/or sample student responses for all discussion prompts, checks for understanding, data analysis, etc., indicated in the magenta-colored text. For example, in the grade 7 Chemical Formulas lesson, the "Check for Understanding " section of the Explore guides teachers to evaluate the 3-2-1 Pyramid with a rubric based on summarizing

key scientific ideas. Materials include the following prompts and sample responses: “What are three interesting facts that you learned in this lesson?? Sample response: All matter is made of atoms; atoms of different elements combine to form compounds; chemical formulas of molecular compounds show the number of each type of atom in the molecule

- Materials include resources that guide teachers in evaluating student responses. In both formative and summative assessment settings, materials provide a rubric for teachers each time a student is asked to respond to a prompt. This rubric can be used to evaluate whether students are rated as on-target, making progress, and getting started for each component of the learning objectives and support teachers in evaluating constructed-response style assessment items. For example, within the grade 7 Matter and Solutions unit, the lesson *Bonds that Bind* asks students to respond to the prompt, “Compare Elements Versus Compounds.” The rubric gives detailed criteria based on comparing information by identifying similarities and differences.

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, teachers' interpretation of the data, and tools to support teachers in responding to data to inform instruction. The Techbook provides several assessment guidance documents within the Course Materials to support teachers with use, analysis, and data-driven instructional planning.
- The Lesson and Concept Data Reflection Guidance documents provide teachers with reflection questions for after assessments to analyze the effectiveness of a lesson or unit. The documents guide teachers in how to look at data holistically, by a specific question, at a specific student, or at a specific standard in the summative concept assessments. The documents provide suggestions for how to form groups based on data using the Lesson Assessment Reports. "Consider grouping students into the following groups:
    - 1) students needing remediation or reteaching,
    - 2) students needing repeated practice with a particular component of the learning objective,
    - 3) students needing extension or enrichment, and
    - 4) students who do not need target support at this time in the learning cycle."
- The Assessment Administration Guide, located under Course Materials, provides tips for administering summative assessments, including setting up a productive testing environment and scripts for the teacher. The guide also shows the teacher how to assign assessments, view progress, and score information.

Materials 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 include self-reflection questions for teachers to use after analyzing and interpreting data, found under Course Materials in the Lesson and Concept Data Reflection Guidance documents.

- Within the formative assessment items in each concept, materials provide embedded scaffolded feedback that is automatically pushed to students when they select the incorrect answer. There are three rounds of scaffolded feedback that support students' individual needs by providing hints that will guide them toward the correct response.
- Course Materials include documents providing support for teachers in analyzing and interpreting data from the various types of assessment items in the program. Each document provides a step-by-step process for teachers to follow as they receive results from the lesson and concept assessment. Additionally, materials provide guidance for examining data by question or by student, as well as how to group students based on performance. Descriptions of how teachers can adjust instruction and plan future core instruction for the whole class or individual students are included along with guidance on identifying and utilizing additional Discovery Education resources to supplement lessons for reteaching, remediation, and enrichment.

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 teacher guidance for responding to student data. Located under Course Materials, Lesson Data Reflection Guidance and Concept Data Reflection documents support teachers in analyzing and interpreting data from the various assessment items in the program. For example, when guiding a teacher to form small groups, materials state, "Whether a teacher is analyzing data for a single item or a set of items in a lesson, it is likely reteaching and remediation may be necessary to meet the needs of individual or groups of students. As teachers review data, they should determine thresholds for scores based on each class that would be most impactful for reteaching, remediation, and enrichment. Use the data in the Lesson Assessment Reports as a data source for analysis."
- Documents in the Course Materials section of the digital product provide a step-by-step process for teachers to follow as they receive results from the lesson and concept assessments. Materials include guidance for examining data by question or by student, as well as how to group students based on performance. Descriptions of how teachers can adjust instruction and plan future core instruction for the whole class or individual students are included, along with guidance on identifying and utilizing additional Discovery Education resources to supplement lessons for reteaching, remediation, and enrichment.
- The Concept Assessment report data can be exported to Excel/CSV format. This allows teachers to manipulate the data to meet their needs, creating custom groupings based on TEKs-targeted groups. For example, the teacher could color-code all the students who correctly scored above a specific threshold on a particular standard to create a group for enrichment.

Discovery Education Science Techbook for Texas Grade 7

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.

- Formative and summative assessments contain items that are scientifically accurate, avoid bias, and are free from errors. For example, the grade 7 Unit 1, Concept 1, Concept Summative: *Chemical Formulas* contains an age-appropriate assessment that has non-biased and scientifically accurate questions.
- Assessments contain items for the grade level that are scientifically accurate. Formative and summative assessments include assessment items that align with taught objectives and present grade-level content and concepts, science and engineering practices (SEPs), and recurring themes and concepts (RTCs) in a scientifically accurate way. In each concept, materials include Elaborate and Extension lessons. These lessons include summative assessments that require students to integrate the SEPs and RTCs with the scientific knowledge they obtained throughout the previous lessons. For example, in the grade 7 lesson *STEM Project Starter: Making a Better Adhesive*, within the Matter and Solutions unit, materials provide the teacher with the following overview: “This STEM project is a summative assessment in which students learn how unexpected benefits sometimes result as scientists and engineers work on a solving a problem. Students evaluate an engineered material and how it was improved. They also conduct their own experiment to determine how different adhesives may be better suited to different surfaces. Consider having students compare results of their experimental data and explain any discrepancies that may arise.” However, teacher materials do not list any TEKS for this assessment task, making identifying the SEPs and RTCs difficult. Without an assessment companion that lists these extensions as summative assessments and identifies the dual and

triple-coded TEKS, identifying these as true 3D assessments proves to be challenging for teachers.

- Throughout materials, assessments contain items for the grade level and course that are free from errors. For example, the assessment at the end of the lesson *Careers and Carbon Chemistry,* within the grade 7 Matter and Solutions unit, asks students: "Use the data and information from the reading and key ideas about elements, compounds, and molecules to write an argument. What problem is being addressed? What is the solution, as well as its pros and cons? Explain why you support or oppose the solution." Materials provide a sample student response. “Sample response: Plastics cause environmental problems because they take a long time to degrade, negatively impact organisms and ecosystems, and come from fossil fuels that add pollution to the air. Bioplastics are a possible solution to this problem because they tend to biodegrade quickly and are made from renewable resources like plant materials. They also do not release harmful toxins when they break down. Since cellulose has a similar chemical structure to the polymer chains in normal plastics, bioplastics have similar properties and can be used for similar functions. People may need time to get used to bioplastics, but the pros seem to outweigh the cons in terms of science and the environment.”

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

- Materials provide assessment tools that use clear pictures and graphics. In the grade 7 lesson *Temperature and Conduction*, within the Motion and Energy unit, students watch videos and read about temperature and conduction. Materials provide clear graphics of melting ice cream and ice.
- Materials provide assessment tools that use clear pictures and graphics that support student learning of the concept. For example, within the grade 7 Matter and Solutions unit, the lesson *Atoms, Elements, and Compounds* contain images of a teenager wearing sunglasses, a video about elements, an image of the periodic table, and an image of a food nutrition label. All of these images are clear, age-appropriate, and help build conceptual understanding.
- Materials provide assessments that have pictures and graphics that are developmentally appropriate. For example, the grade 7 Concept Summative: *Reproduction,* within the Life Systems and Processes unit, provides a diagram of fish to check the student’s understanding of asexual and sexual reproduction. The photo is clear and age-appropriate. The magnifying feature allows images to be enlarged for ease of viewing.

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

- Materials provide guidance for teachers to consistently and accurately administer assessment tools. Materials provide both general and specific guides that discuss the assessment program. For a general overview, the *Grades 6-8 Program Guide* provides an overview of the assessment tools provided. “Science Techbook provides several formative and summative assessment opportunities, carefully embedded in the cycle of learning to help teachers guide their students to mastery of key learning targets and objectives. These assessment opportunities allow teachers and students to monitor progress and provide direct practice with STAAR-like item types across a variety of assessment formats.” Additionally, materials provide an Assessment Guide that supports the teacher in understanding the types of formal and informal assessment tools included in the curriculum. "Science Techbook for Texas includes a variety of assessment opportunities, including Lesson assessments (formative) and Concept assessments (summative),

as well as additional practice items and tools." The document explains the icons used and the different types of lesson assessments that can be seen throughout each grade level. Materials include a guide, the Teacher, Caregiver, and Administrator Guide to Product Reports, that provides more specific support in describing an overview of the types of assessment data, with directions on how to access each report. This document provides support for the teacher's understanding of the various features that serve as tools to analyze data, as well as concept and lesson reports that provide scores in easy-to-understand views.

- The Lesson Data Reflection and Concept Data Reflection document guide and support teachers in analyzing and interpreting their data. The document includes reflection questions for teachers to consider throughout the process in order to make insights based on patterns or trends in the data to better understand student performance. Additionally, materials provide guidance for examining data by question or by student, as well as how to group students based on performance. These documents include descriptions of how teachers can adjust instruction and plan future core instruction for the whole class or individual students, along with guidance on how to identify and utilize additional Discovery Education resources to supplement lessons for reteaching, remediation, and enrichment.
- The Assessment Administration document provides detailed guidance on how to administer assessments, starting with how to assign assessments to a class or group of students. It also includes guidelines for administering the summative assessments and how to score constructed response questions in both the lesson and summative assessments. Additionally, the document includes a script to be used during test administration.

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 assessments and lesson tools so that students of all abilities can demonstrate mastery of learning goals. Materials include accessibility tools such as text-to-speech, highlighting, and closed-captioning built into the digital platform to allow students to access content and demonstrate their learning. For example, in the grade 7 lesson *Solids, Liquids, and Gases*, within the Matter and Properties unit, students can turn on closed-captioning in the video.
- Materials provide students the opportunity to double-click on words or phrases in the lesson assessments to have them read aloud. Lesson assessments also include the ability to enlarge images, translate using browser technology, and printable sheets for items.
- The Assessment Accommodations guidance document, located under Course Materials, provides additional support to teachers, parents, and administrators describing available accommodations or strategies for assessment accommodations. This document provides detailed information of each accommodation available within the assessment experience including how to provide separate, detailed instructions to groups and individuals. Additionally, this document provides step-by-step guidance on how to create additional practice assessments or alternate forms of assessments.
- The Assessment Accommodations guidance document explains how instructions can be given in English or Spanish and how assessments can be printed and given to students that need paper-based assessments. The document also includes instructions about how to develop different assessments if needed to accommodate different learners

Discovery Education Science Techbook for Texas Grade 7

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.	PM
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

Partial Meets | Score 1/2

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

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

- Materials include teacher guidance for scaffolding instruction and differentiating activities for students who have not yet achieved mastery. In each concept, the Lesson Planning document provides suggested activities to scaffold learning for students who need additional support in the "Approaching Learner" sections. For example, in the grade 7 lesson *Changes of States*, within the Matter and Properties unit, materials provide the following guidance: "If students struggle, encourage them to spend extra time in the interactive, either by themselves or with a partner. Have students describe the changes they observe in the molecules of water, first when the water is heated and then when it is cooled. They should recognize that the molecules do not break into atoms or rearrange to form new molecules. Instead, they move faster and eventually separate when they are heated, and they move slower and eventually vibrate in place when they are cooled."
- Materials do not include ample resources to ensure that teachers can target instruction to develop precursor skills necessary to access grade-level content. For example, materials do not contain additional lessons for small group instruction based on students' areas of need. Materials do not include scientific texts at different reading levels for independent or guided small-group instruction. Materials also do not include various student activities that can be assigned to reteach, review, and practice skills for students who need additional support for mastering course-level science concepts and skills.
- Materials do not provide additional resources for targeted instruction and differentiation to support students who have not yet achieved mastery. Materials lack additional reteaching

materials for intervention purposes to support students who may still not have achieved mastery after instruction or the end of concept summative assessments. Materials provide no explicit resources to support additional small-group instruction.

- While the Discovery Education platform includes various activities, such as virtual field trips, videos, and activities, these additional resources are not integrated into the digital techbook. These additional resources should be integrated into the digital techbook rather than linked to an external platform.

Materials provide enrichment activities for all levels of learners.

- Materials provide enrichment activities that account for learner variability. Teacher guidance and resources encourage the exploration and application of grade-level science knowledge and skills in a variety of ways. Materials provide a variety of resources for students to construct new knowledge. These include text, video, simulations, scientific investigations, and engineering challenges. All lessons on all concepts in each unit provide at least some of these opportunities. For example, in the grade 7 concept *Dissolving Matter*, within the Matter and Solutions unit, the first three lessons provide opportunities for students to observe and record an investigation, discuss with peers, write their predictions, and record observations. Materials also provide students with videos to watch and scientific texts to read.
- Materials utilize the 5E model to deliver instruction and enrichment activities to all levels of learners. In each concept, the Elaborate section offers an extension of learning for all students through investigations into STEM careers or STEM in Action. For example, in the *STEM Project Starter: Creating Your Own System for Classifying Beans* lesson within the grade 7 Life Systems and Processes unit, materials direct teachers to provide students with beans to classify using their own system. Once complete, materials guide students to write an explanation as to why they classified the beans the way that they did. The lesson then asks them to brainstorm how they could use technology to classify the beans. Once complete, materials ask students to find the percentage of beans per category and then apply this knowledge to real-life situations in an ecosystem.
- Materials include guidance to regularly engage in tasks such as writing prompts and small-group or partner discussion for responding to lessons in various ways. For example, in the grade 7 Matter and Solutions unit, the lesson *Explaining the Reaction in a Bag* asks students to revise their explanation of a phenomenon they engaged in the first lesson. “Now that you have learned more about physical and chemical changes, write a final explanation describing what is happening to the matter during the reaction in the bag.” In the lesson *Heat-Go-Round*, within the grade 7 Motion and Energy unit, materials provide students with numerous prompts to discuss with small groups such as “What are examples of convection? How does convection transfer thermal energy?”

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

- Materials include recommendations for just-in-time scaffolds to develop productive perseverance in learning at the moment. For example in the grade 7 lesson *Bonds that Bind*, within the Matter and Solutions Unit, students investigate how atoms combine to form elements and compounds. Students use an interactive simulation to compare elements and compounds in terms of atoms and molecules, chemical symbols, and chemical formulas. Materials provide the teacher with guidance and procedures for the students to complete the

investigation individually, in small groups, or teacher-led. Materials provide the teacher with suggested questions to ask the students to engage the students in the task, such as: “Based on the table, which atoms have the most and least outer electrons? Would an H atom bond to another H atom? Why or why not? Which two atoms are more likely to bond together: H and Cl, or H and O?”

- Materials include prompts and cues for learners when they are stuck on a particular task or unsure how to proceed. The Science Techbook for Texas – Grade 7 provides suggested activities to scaffold learning for students who need additional support in the “Approaching Learners” section of the Lesson Planning documents. For example, within the Life Systems and Processes unit, the Lesson Planning document for *Investigating Tree Classification* provides teacher guidance if students do not understand dichotomous keys. "If students struggle, guide them by reading the question in the top row aloud. Then, direct students to observe the diagram of the leaf and decide if the answer to the question is yes or no. Continue with the additional steps until the leaf is correctly identified. Tell students that all dichotomous keys are used in this way." The lesson then encourages students to go back and revise their work. Materials do not just give students the answer, instead, they provide students with more information to encourage productive struggle.
- Materials provide extra resources for students who are ready to extend their learning. For example, the Science Techbook for Texas – Grade 7 includes Elaborate lessons within each concept that allow these students to extend their knowledge and apply new knowledge to new situations. For example, after learning about space in the Solar System Properties concept within the Dynamic Earth and Space unit, an Elaborate lesson *Project: Spacecraft Technology* includes text and video, then guides students to “identify a spacecraft mission that interests you. Spacecraft have studied or visited every planet in the solar system, the sun, several moons, comets, asteroids, and Pluto. Do your own research to learn about the instruments on the spacecraft that completed the mission.”
- Materials provide support and resources for students who are ready to accelerate their learning. In each concept, materials provide suggested activities to extend learning for students who are ready for acceleration, located in the “Advanced Learners” section of the Lesson Planning documents. For example, in the grade 7 lesson *Investigating Forces on Marbles*, within the Motion and Energy unit, the “Advanced Learners” section states: “Challenge students to draw a force diagram for trickier scenarios involving the motion of objects. For example, students can compare how a force diagram of a marble will change if the steepness of a ramp increases, if a marble rolls up a ramp (instead of down), or if a marble is dropped in a pool of water compared to being dropped in the air. Remind students to use evidence from the motion of the marble in each scenario to support their ideas in their force diagrams.”

Discovery Education Science Techbook for Texas Grade 7

Indicator 7.2

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

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

Meets | Score 2/2

The materials meet the criteria for this indicator. Materials include 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 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. Materials include a variety of lesson types in each concept from hands-on investigations, to interactive model lessons, to media and literacy lessons, for the purpose of gathering evidence to tie back to the real-world phenomenon in the Engage section of the lesson. These varied learning experiences deepen students' understanding, allow students to demonstrate science and engineering practices, and require students to think about recurring themes and concepts. For example, in the grade 7 Matter and Solutions unit, Concept 1: Chemical Formulas, materials provide the following guidance:
    - Lesson 2: *Investigating Atoms and Molecules*, students develop and use models to compare atoms, molecules, elements, and compounds by participating in a hands-on activity.
    - Lesson 3: *Bonds that Bind*, students investigate how atoms combine to form elements and compounds by using an interactive simulation.
    - Lesson 4: *Atoms, Elements, and Compounds*, students explain the differences between atoms, elements, and compounds by reading scientific texts and watching videos.

- Materials include clear guidance to support teacher understanding of developmentally appropriate instructional strategies. The Educator Supports section includes an Instructional Strategies section that provides teachers with knowledge of implementing research-based instructional strategies throughout the lessons.
- Materials include clear guidance to support teacher understanding of developmentally appropriate instructional strategies designed to engage students in content mastery. Embedded in lessons across each concept, materials provide Spotlight on Strategies (SOS) videos for the teachers. These research-based strategies help engage students and expect them to analyze information and share their thinking with their peers to refine their ideas. For example, in the grade 7 Motion and Energy unit, the lesson *Speed and Velocity* includes an SOS video and a text description of the strategy that provides the teacher guidance on an instructional activity called Take A Walk. “Take a Walk: Use this strategy to engage students in actively processing what they have learned. After students have written their responses about average velocity, ask students to partner with someone across the room. Set a time and allow partners to share their summaries. After the time is up, have students switch partners with someone else across the room. Switch partners a third time and share their responses. Ask students to return to their seats and share the most compelling pitch they've heard and why.”
- Materials include scientific connections to the real world and current events. In the grade 7 Dynamic Earth and Space unit, the lesson *STEM Project Starter: Tectonic Activity in My State* asks students to identify which continental plate they live on. Once they have identified the plate, students find the closest plate boundary to them and make predictions about the plate tectonic activities that affect their area. Students then find where the closest seismic monitoring station is to them, identify what types of instruments they use, and how the data they collect could help predict tectonic activity in the future.

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

- Materials support a variety of instructional groupings (e.g., whole group, small group, partners, one-on-one). There are activities in each concept that allow for such groupings. For example, in grade 7 lesson *Observing the Water Cycle*, within the Matter and Properties unit, materials provide the following guidance for the teacher. “Have students form small groups of three to four students. Each student in the group should take a few minutes to share their initial model and explanation. After each student has presented his or her model, the other students should each write down one question about the explanation and model and one suggestion for improvement.”
- Materials guide teachers on when to use specific grouping structures such as Think-Pair-Share. Within the grade 7 Cells, Ecosystems, and Variation unit, the lesson *Investigating Interactions in Ecosystems* provides student guidance. “Discuss the following questions with a classmate: How would you describe the relationship between birds and flowers? What happens if two species in an area depend on the same resources?”
- Materials guide teachers on when to use specific grouping structures based on the needs of students. At key points throughout the learning cycle, the Lesson Planning documents provide the teacher suggestions on grouping students based on student’s needs, interests, or preferences. These teacher materials also include differentiation strategies for advanced learners, approaching learners, etc.

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

- Materials provide multiple types of practices (e.g., modeled, guided, collaborative, independent). For example, in the Chemical Formulas concept of the grade 7 Matter and Solutions unit, students observe a phenomenon as a class in the Engage lesson and have a whole class discussion as their teacher leads it. They work in collaborative groups to conduct investigations and make sense of models (physical and pictorial models of atoms, molecules, elements, and compounds). They work independently on answering questions in the "Check for Understanding" section of each Explore lesson and the "Review" section of each Evaluate lesson.
- Materials allow students to meet in groups to discuss scientific content. Within the grade 7 Motion and Energy unit, the lesson *Demolition Engineer* guides students to gather information about the demolition of a building by reading a passage. Once complete, students find a partner or a group to collaborate and develop a two- to three-minute presentation on how careers are related to motion, speed, and velocity.
- Materials provide teacher guidance and structures for effectively implementing multiple types of practices. There is detailed guidance in the Lesson Planning document for each lesson. For example, in the lesson *Observing CO_2 and CO* within the Matter and Solutions unit, materials explain how to set the purpose of learning in this concept, how to collect student observations and questions about the anchoring phenomenon, how to construct a driving questions board, how to make connections to recurring themes and concepts, and how to support students to create initial models to explain the phenomenon. This helps create engagement and helps teachers to elicit students' prior knowledge.
- Materials provide teacher guidance on metacognitive strategies to use with students, such as self-reflection to assess their own knowledge, thinking, and learning. In the unit Life Systems and Processes, the lesson *Infectious Diseases* provides students with questions to discuss with a classmate. Once complete, students read articles and watch supporting videos about Viruses and Bacteria, Fungi and Parasites, and Infection Routes. At the end of the unit, students use self-reflection and revisit the original phenomena of what systems are involved in healing a cut.

Materials represent diverse communities in the images and information about people and places.

- Materials represent diverse communities using images and information that are respectful and inclusive. Images reflect the diversity of school communities and match the content. Characteristics vary in images to include race and ethnicity, skin tone, gender identity and expression, age, disability status, body size and shape, and hair texture. For example, in the grade 7 Matter and Properties unit, the lesson *Review: States of Matter* includes an image of students in a classroom that reflects the diversity of school communities. The names presented in the assessments equally include male and female names; they also represent diverse backgrounds.
- Materials represent diverse communities. The *Grades 6-8 Program Guide* includes images of students and teachers of different races and there is a similar ratio of boys to girls pictured in the guide.
- Materials represent diverse communities using images and information that are respectful and inclusive. STEM careers lessons allow students to further explore areas of interest beyond the classroom and consider career pathways related to core scientific ideas. These lessons allow students to see themselves as valuable contributors to the larger community.

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Indicator 7.3

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

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

Partial Meets | Score 1/2

The materials partially meet the criteria for this indicator. Materials include some 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 some 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 English Language Proficiency Standards (ELPS.) The Lesson Planning document for most lessons includes guidance for teachers for Beginning, Intermediate, Advanced, and Advanced High English proficiency levels. These lessons provide scaffolding suggestions for each proficiency level when students are listening, reading, speaking, or writing. For example, in the grade 7 lesson *Investigating Atoms and Molecules* within the Matter and Solutions unit, the document provides the following English language proficiency support:
    - "Beginning: In small groups, read the text with students and note the vocabulary words. Encourage students to consult the interactive glossary when needed to help them understand the vocabulary. When students complete the modeling activity, make sure they recognize that the types of atoms are examples of different elements. Provide sentence frames to help them identify elements and compounds and to interpret chemical formulas. Hydrogen is an example of a(n) _____. Its chemical symbol is the letter _____. A compound that includes hydrogen is _____
    - Intermediate: As English Language Learners read the text, have them jot down key ideas and any concepts they find confusing. During the modeling activity, encourage students to use the correct language to describe their models. Provide sentence frames for students to help them distinguish between atoms, elements, and compounds, and to

describe their models. I used a clay ball that was the color _____ to represent an _____ of hydrogen. Hydrogen is an example of an _____. It combines with oxygen to form water, which is a _____.

- Advanced: Have students describe the models they construct to one another. As they discuss these models, encourage them to use the correct vocabulary from the text and as described in the table "Examples of Elements and Compounds." Students may quiz one another about the different examples of chemical formulas and why they represent either elements or compounds.
- Advanced High: Have students suggest other examples of chemical formulas and then construct their models, or have students construct a model and then identify its chemical formula. As a class, discuss how the rules and principles described in the text apply to a wide range of chemical compounds."

- Materials include linguistic accommodations commensurate with various levels of English language proficiency as defined by the ELPS. Materials embed scaffolds for emergent bilingual (EB) students into lessons, such as visuals, gestures, sentence stems, graphic organizers, anchor charts, and manipulatives. While the differentiation strategies are usually prefaced with "If students struggle," they are also excellent strategies for EB students. For example, within the grade 7 Matter and Solutions unit, the Lesson Planning document for *Chemical and Physical Changes* provides the following guidance: "If students struggle, prepare a two-column table on the board with column headings of chemical changes and physical changes. Ask the class to describe an example of each type of change and why it meets the definition of this change. Record their responses, and work with the class to develop the table as a useful summary of the two concepts." It would be beneficial for the publisher to remove the "if students struggle," as this strategy is an excellent example of multiple means of representation in the Universal Design for Learning.
- Materials provide teacher guidance for incorporating linguistic accommodations into a lesson. In the grade 7 lesson *Colossal Fossil Jostle*, within the Dynamic Earth and Space unit, materials provide guidance to teachers to support EB students to complete an interactive activity. In the interactive activity, students determine how clues from fossils help provide information about the history of Earth. For EB students that are beginners, materials suggest that prior to launching the interactive activity, the teacher checks in to make sure that students understand the words young/younger than and old/older than. Students then point to the different layers and write a sentence comparing two layers with the provided sentence stems.

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

- Materials encourage very little strategic use of students' first language as a means to linguistic, affective, cognitive, and academic development in English. The Teacher Overview Lesson Planning section for each concept includes a section on the Spanish cognates for the vocabulary words for the concept. For example, in the grade 7 Matter and Solutions unit, Concept 1 lists the Spanish cognates: átomo, masa, molécula, precipitado, reacción química, reactividad, sustancia. Student materials include a glossary or text boxes, however, these definitions do not include cognates or definitions in second languages (i.e., Spanish.)
- A few of the videos in the glossary do include closed captioning in Spanish, but the animations do not include any language supports. Some interactives in the Techbook can be accessed in different languages, however, it is inconsistent. For example, the grade 7 lesson *Life on the*

Edge, in the Life Systems and Processes unit, includes an interactive that can be viewed in English or Spanish, while the interactive within the lesson *Carbon Cycle*, found within the same unit, can only be viewed in English. The materials lack a resource for teachers to have an overview of the specific language supports for each language that is available for each concept.

- Materials do not have other supports that encourage strategic use of students' first language as a means to linguistic, affective, cognitive, and academic development in English. For example, the materials do not include:
    - Support for teachers about how and why to promote and build first language proficiency.
    - Tips for teachers about the importance of allowing students to express their understanding in their first language and practical suggestions for teachers who do not speak the student's first language.
    - Family letters explaining the instructional objectives and/or homework in languages other than English.
    - Links to resources for translation or support in first languages.
    - Textbooks or audio/video clips that explain concepts in languages other than English.
- Materials include brief information about language transfer in The *Grades 6-8 Program Guide,* however, more in-depth instructions are only available as what seems like an additional paid resource, Experience Level resources. Additionally, the "English Language Learner Center" portion of the product website is not available for reviewers to access.

Discovery Education Science Techbook for Texas Grade 7

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 caregivers about the design of the program. Materials provide caregivers with a Parent/Guardian Letter describing how to access the program and how the design of the program supports students to act and think like scientists and engineers.
- Materials provide information to share with students about the design of the program. Materials provide students with a letter describing the program. “These resources will help you make observations, analyze, and interpret data to figure out real-world phenomena. You will solve problems, make connections between science and the world around you, and explore questions you have about science.”
- Materials provide information to share with caregivers in the Caregiver Course Overview. “Your child’s teacher is using Discovery Education in their classroom to help your child master key scientific concepts and act and think like a scientist. Your student can sign in anytime to engage with exciting digital activities and resources across a variety of subjects, grades, and topics of interest. Students engage with interactive science instruction to analyze and interpret data, think critically, solve problems, and make connections across science disciplines. In addition, they experience dynamic content, explorations, videos, digital tools, hands-on activities and labs, and game-like activities that inspire and motivate scientific learning and curiosity.”

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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 Caregiver Course Overview includes for each unit a Unit Summary, Key Vocabulary, and descriptions of the Unit Phenomenon. “More details on what we are exploring, along with some suggested ways you can support student curiosity at home, are provided for each unit. Allowing students to make observations of the world around them encourages them to continue to ask questions about the real-world phenomenon we are uncovering in each unit.”
- The Caregiver Course Overview includes "Conversation Starters" for caregivers, which provide questions they can ask their students to talk about the topics at home.
- Materials provide at-home practice activities for caregivers to help reinforce student learning and development. The "Home Connections" section of the Caregiver Course Overview provides activities for parents to do at home to reinforce their learning at school.

Materials include information to guide teacher communications with caregivers.

- Materials include teacher guidance for communicating with caretakers. The Caregiver Course Overview positions caregivers as partners in the learning cycle in the classroom. "The overview provides caregivers with details on the science topics students are exploring, creative ways to support their curiosity, and conversation starters to keep the science discussions going at home." It includes a Unit Summary, Key Vocabulary, and descriptions of the Unit Phenomenon.
- Materials guide teachers to communicate with caregivers and suggest when and what to communicate. Materials guide teachers to communicate often, using easily downloaded files for each student that can also be translated as needed.
- The Caregiver Course Overview includes screenshots for teachers to see what caregivers view when following student progress. Teachers can use this to guide caretakers' involvement in their student's education. "Consider capturing a screenshot of the student’s assignment dashboard and sending it out to caregivers on a monthly basis to keep them updated on their progress. The lesson and concept summative reports can be used for face-to-face, or virtual conferences with parents to display student proficiency toward the desired learning goals."
- The publisher should include the additional resources (Discovery Education Family Resource page and Discovery Education Guide for Families) within the digital techbook rather than linking to an external platform.

Discovery Education Science Techbook for Texas Grade 7

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.

- The materials include a year-long scope and sequence found in the Grades 6–8 Program Guide. The “Grade 7 Scope and Sequence” section breaks down the material by unit and concept titles and their alignment to the Texas Essential Knowledge and Skills (TEKS) and the English Language Proficiency Standards (ELPS). This section includes a general pacing guide that shows what order to teach the material.
- Grade levels are organized by courses. In the grade 7 course, there is a link to “TEKS Alignment.” Within this subsection, all TEKS are listed sequentially and include which concept titles incorporate each of the TEKS.
- A “Table of Contents,” found in the grade 7 course, breaks down each unit by lesson. The “Table of Contents” also shows TEKS alignment for each unit, including pacing. Teachers can review where each of the TEKS is revisited throughout the year by clicking on the links provided in the “Table of Contents.”
- Each grade 7 unit includes “Unit Resources,” which includes a Standards Alignment section for both the TEKS and ELPS. The “Unit Resources” also include a Unit Structure and Pacing section that contains a daily pacing guide with recommended minutes for each unit and an accelerated pacing guide.

Discovery Education Science Techbook for Texas Grade 7

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

- Teacher guidance materials explain connections across core concepts, Scientific and Engineering Practices (SEPs), and Recurring Themes and Concepts (RTCs). These are referenced and defined in the Grades 6-8 Program Guide, which includes a data table that shows how the core concepts are vertically aligned across grades 6–8.
- The Grades 6–8 Program Guide instructs the teacher on the integration of the core concepts, SEPs, and RTCs. The Program Guide states, “The scientific and engineering practices, recurring science themes, and core scientific concepts are not intended to be learned in isolation. Instead, students develop an understanding of core scientific concepts best when they are engaged in scientific and engineering practices, and students learn scientific and engineering practices best when they use them to develop an understanding of core science concepts. By actually engaging as scientists or engineers, students are able to build conceptual understanding through direct observations and interactions, which solidifies and deepens their comprehension of scientific core concepts.” It also includes guidance for facilitating questioning, ameliorating group dynamics, and conducting investigations.
- The materials are written in the 5E format. In Engage, the materials explicitly guide students to use the lens of a focus recurring theme as they investigate evidence throughout Explore and document their new learning and evidence in Explain. Phenomenon Check-Ins, throughout Explore, allow students to make connections across three dimensions as they figure out the phenomenon introduced in Engage. The robust lesson-level teacher support includes targeted discussion prompts, sample models with annotations related to the RTC and content connections, and strategies for students to make connections across all three dimensions. The materials include a lesson plan for each concept. This plan guides the facilitation of the lesson and may provide details on the facilitation of the SEPs and RTCs within that lesson. The lesson plans also include targeted discussion prompts, sample models with annotations related to the RTC and content connections, and strategies for students to make connections across all three dimensions.

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

- The materials intentionally spiral previously taught knowledge and skills throughout the year. The Grades 6–8 Program Guide provides a list of how SEPs and RTCs are spiraled throughout the year. The core concepts are included in the summative assessments at the end of each unit.
- Across each course of the middle school program, summative assessments in each concept consist of two to three-dimensional items that allow for repeated practice and student demonstration of mastery across the SEPs and RTCs. This program allows students multiple opportunities for practice and performance of these components across a course, in addition to opportunities within the other portions of the 5E instructional design of each concept. Each item was written directly to the TEKS, including connections to the SEPs and RTCs, and teachers can use the resulting data to gather data related to needs for retention and mastery.
- Across each course, the materials contain specific content standards within each unit; however, the units are sequenced in each course to build the foundational scientific understandings necessary to achieve the identified core content standards. For example, in the grade 7 course, the core idea of convection is discussed in “Convection and Radiation” in Unit 2, “Motion and

Energy.” Students explore how thermal energy can be transferred through convection and radiation. Students return to this core idea later in the year again in Unit 3, “Dynamic Earth and Space,” in Lesson 5: “Plate Tectonics and Earth’s Surface,” where students explore how convection currents move Earth's plates.

- Materials include opportunities for teachers to check for understanding embedded throughout each lesson. In the Checks for Understanding sections, “students engage in a series of quick digital or print assessments directly tied to the standards of the lesson to demonstrate their understanding related to the targeted portion of the standard.” At the end of each lesson, there is a review section, What Did You Figure Out?, that allows students to discuss what they have learned in the concept with their peers through various activities such as a quick exit ticket or Turn and Talk.

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Indicator 8.2

Materials include classroom implementation support for teachers and administrators.

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

Meets | Score 2/2

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

Materials provide teacher guidance and recommendations for 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. The materials provide teacher guidance in using the resources at different levels of the product: course level, unit level, concept level, and lesson level.
- At the course level, the Grades 6–8 Program Guide provides teachers with clear guidance on how the materials support student discourse and how teachers can effectively facilitate student-led discussions. The Grades 6–8 Program Guide further breaks down the materials by unit level, providing clear guidance for the teacher on how to use the Unit Planner.
- The Lesson Plans found within each Concept provide teacher guidance and recommendations for the use of technology. For example, in a grade 7 lesson, “Need for Speed,” within a unit on “Describing Motion,” the materials contain a virtual lab embedded for students. This lab includes teacher directives in the Lesson Plans.

- The materials provide scaffolds to support and enhance students' learning. For example, in a grade 7 lesson, “Investigating the Changing Continents,” the materials provide the teacher with differentiation strategies for assisting Emergent Bilingual students at varying levels of the English Language Proficiency Standards. The teacher overview section of the Lesson Plan includes Spanish cognates.
- The Discovery Science Techbook organizes the materials in a way that facilitates ease of implementation and use, including videos on how to implement research-based instructional strategies. For example, in a grade 7 lesson, “Evidence of Earth's History,” the materials provide the teacher with an instructional video on how to facilitate the “Z Chart” instructional strategy. Some embedded resources, such as graphing calculators and whiteboards, include video instructions.

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

- The materials include standards correlations in multiple places for the teacher, including an overview for the year in the “Scope and Sequence” located in the Grades 6–8 Program Guide and in the Table of Contents on the homepage of the Techbooks.
- Science Techbook for Texas was designed to support Texas ELA and Math standards. The publisher will provide the alignment chart in Course Materials on the home course page. Each concept found in the course aligns with a subset of ELA standards across the Engage, Explore literacy, and Explain lessons in each concept. In every concept, students are speaking, writing, and listening to support comprehension of science content. The embedded discussion prompts drive students to engage in meaningful discourse and practice active listening while developing their ability to contribute relevant information to collaborative discussions. The variety of text types in the program provides students with opportunities to deepen their comprehension of complex texts. The embedded interactive glossary tool allows students to validate their understanding of science vocabulary. Specific grade 7 math standards align with lessons included in the Science Techbook for Texas, Grade 7 course. Throughout the program, students apply mathematics to everyday problems, use mathematical problem-solving to make sense of scientific phenomena, and communicate mathematical ideas and reasoning using a variety of different representations
- The materials include science standards (TEKS) and English Language Proficiency Standards (ELPS) correlations at the unit and lesson levels. For example, in a grade 7 unit about “Motion and Energy,“ the Unit Planner lists the TEKS and ELPS by science concept. The Unit Resources section also includes a Standards Alignment document that lists the TEKS and ELPS by concept and lesson.

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

- The materials include a list of equipment and supplies needed at the unit level. This list can be found in the Unit Resources section of the Discovery Ed Techbook. The resource, which is titled “Hands-on Lessons: Preparation and Materials,” provides a comprehensive list of all equipment and supplies needed to support students and teachers throughout the entire unit. The resource also includes guidance for the teacher on advanced preparation.

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- Each lesson includes additional materials and resources in the “Lesson Planning” document. Some of these resources contain a “Materials List, Safety, and Preparation” document necessary for each lesson. For example, in the grade 7 lesson, “Investigating Atoms and Molecules,” the section of the lesson plan titled “Materials List” details the equipment and supplies needed for the students and teacher in the lesson.
- Science Techbook for Texas includes a comprehensive list, found in the Course Materials, that includes all the necessary equipment and materials for the successful implementation of this course. This spreadsheet breaks down the entire year by Unit, Concept, and activity title. The Comprehensive Materials List breaks down the materials by how many student groups it provides for (eight), the quantity of materials necessary for the whole class, or if it is intended for a teacher demonstration.

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. For example, in a grade 7 lesson, “Investigating Changes in Chromatography,” materials include an investigation of physical and chemical changes in chromatography. Materials instruct the teacher as follows:
    - Remind students to follow all lab safety guidelines, including the following:
    - Wear safety goggles and other proper safety attire as needed for the materials being used.
    - Tie back long hair and remember not to eat or drink anything in the lab.
- The materials provide similar student guidance for safety practices and grade-appropriate use of safety equipment during investigations. For example, in a grade 7 lesson, “Investigating Changes in Chromatography,” materials include an investigation of physical and chemical changes in chromatography. Materials instruct the students to “Follow all safety guidelines. Wear safety goggles and other proper attire as needed. Tie back long hair and remember not to eat or drink anything during the activity.”
- In the grade 7 level techbook, there is a Course Materials link. The Course Materials include a document titled “Safety in the Science Classroom.” This document provides guidelines for the students: “Following common safety practices is the first rule of any laboratory or field scientific investigation.” The document includes sections titled Dress for Safety, Be Prepared for Accidents, and Practice Safe Behavior. Each section includes more guidance for students to follow that is grade-appropriate.

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Indicator 8.3

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

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- The Discovery Science Techbook includes guidance and recommendations on the required time for lessons. For example, the Table of Contents details the estimated minutes of each lesson for each concept for the entire year.
- The materials include guidance and recommendations on the required time for learning activities within lessons. Within each lesson, the materials guide the timing for each learning activity. Each lesson plan includes detailed time stamps for the teacher.
- These materials include suggested pacing in two different ways (comprehensive and express) that are focused on schedules based on 45-minute lessons. There are built-in opportunities for extension for students who need an additional level of support.

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

- The materials include guidance on strategic implementation that ensures the sequence of content is taught in an order consistent with the developmental progression of science but also provides flexibility for districts. For example, the Grades 6–8 Program Guide describes the core structure of the program: “The program is organized into standards-aligned cohesive units that can be arranged in various sequences to meet your district’s needs. Each unit includes concepts that are strategically bundled, ensuring students will uncover all core scientific content. Concepts within each unit are structured with lessons that follow the 5E Framework: Engage, Explore, Explain, Elaborate, and Evaluate. Units, concepts, and lessons are designed to pique

student interest and scaffold acquisition of specific scientific ideas as students learn about the world in which they live." The materials provide numerous extensions and hands-on activities.

- The materials include guidance on strategic implementation that ensures the sequence of content is taught in an order consistent with the developmental progression of science. The Unit Summary, located in the Unit Planner, details the flow and interconnectedness of the concepts taught within the unit.
- Units include concepts that are strategically bundled. The materials clearly delineate the order of units to ensure students learn about precursor concepts first. For example, in grade 7, the materials have students investigate levels of organization of cells, tissues, and organs before students learn about human body systems.

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

- The materials include units, lessons, and activities for a full year of instruction. For example, the Comprehensive Concept Pathway included in each Unit Structure and Pacing Guide provides evidence that the materials include lessons and activities for a full year of instruction. The units can be reasonably implemented within the time constraints of a school year, and the activities and routines within each lesson can reasonably be completed within the length of time suggested.
- The materials provide guidance for adjusting to local time and scheduling constraints. For example, materials provide teacher guidance on how to make adjustments to condense units within the Express Pathway found in the Unit Structure and Pacing guide if instruction needs to be shortened.
- The Grades 6-8 Program Guide includes a brief explanation of how to use the lessons successfully throughout the year; it also indicates that the structure of these lessons can be altered to fit different school districts' needs.

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Indicator 9.1

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

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

- Yes, digital materials include an appropriate amount of white space and overall design that does not distract from student learning. Science Techbook supports student annotating and note-taking by allowing them to highlight text. The highlighted text automatically feeds into their digital Notebook, which can be accessed at any point in the learning cycle. Additionally, students can compile thoughts and notes relevant to each lesson within the structure of the notebook. Technology-enhanced items within the lesson page allow students to make their thinking visible. From the top navigation bar, students can access a series of tools that may be helpful with their interaction with lesson content, including graphing and whiteboard tools. Concept-level glossary terms are also hyperlinked within the text to provide additional comprehension support. Students can also access the full interactive Glossary on each lesson page and by selecting hyperlinked text within the lesson page.
- Digital materials include an appropriate amount of white space that does not distract from student learning. For example, materials include appropriate use of white space, such as margins, edges, and empty spaces around the content, all used consistently throughout digital materials. Materials use similar spacing between sections, equal line height in body text, and adequate spacing between paragraphs (greater than the line height of body text).
- Teacher guidance materials are designed with clear, designated places for important information. Teacher's Guides are designed so that teachers can locate important information for planning and implementation. Materials include resources such as an Assessment Guide, Program Navigation and Vertical Alignment Guide, and Program Guide. Each unit includes

resources such as Unit Structure and Pacing, a Unit Planner, Background Knowledge, Hands-On Lessons: Preparation and Materials, and Standards Alignment.

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

- Materials provide age-appropriate pictures and graphics that support learning and engagement without being visually distracting. For example, the student glossary contains multiple pictures and graphics, accessible when the student wants to use them and hidden when not needed.
- Materials consistently use age-appropriate pictures and graphics that support student learning and engagement without being visually distracting. For example, student pages use two to three pictures per page on average (sometimes video clips are used). The Techbook utilizes clear images that are highly relevant to the context.
- Materials embed age-appropriate pictures and graphics that support student learning and engagement without being visually distracting. For example, in the grade 7 Matter and Solutions unit, the lesson *Bonds That Bind* includes an image of a methane molecule (showing the individual atoms that make up methane.) Before the image, the Techbook prompts, “Some atoms join more readily than others. Molecules tend to be stable when the shells in their atoms are completely filled. The first shells can fit two electrons and the other shells can fit eight.” Following the image, materials prompt students to discuss why the atoms that form methane readily bond together.

Materials include digital components that are free of technical errors.

- 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.

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Indicator 9.2

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

1	Materials integrate digital technology and tools that support student learning and engagement.	Yes
2	Materials integrate digital technology in ways that support student engagement with 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.	Yes
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 science and engineering practices, recurring themes and concepts, and grade-level content. Materials 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.

- Materials integrate digital technology and tools that support student learning and engagement. For example, student digital components include embedded tools, such as note-taking, variable font size, text-to-speech, a glossary, highlighting, and editable forms.
- Digital technology and tools enhance student learning through such features as videos, interactives, simulations, and online worksheets and assessments. For example, the grade 7 lesson *Bonds that Bind*, within the Matter and Solutions unit, includes a video and an interactive simulation. It also provides an online data table for students to complete to show their understanding.
- Materials provide students opportunities to double-click and highlight words within the text. When students engage in this action, materials prompt students with the choice to have the words read aloud and the capability to highlight them. This supports student learning and engagement.

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Materials integrate digital technology to support student engagement with science and engineering practices, recurring themes and concepts, and grade-level content.

- Materials integrate digital technology to support student engagement with science and engineering practices (SEPS), recurring themes and concepts (RTCs), and grade-level content. For example, materials provide interactive simulations and models for students to explore scientific concepts in a virtual environment.
- Materials consistently integrate digital technology to support student engagement with SEPs. For example, in the grade 7 lesson *Bonds that Bind*, within the Matter and Solutions unit, an interactive lab guides students to explore the SEPs and analyze how different atoms combine.
- Materials consistently integrate digital technology to support student engagement with the RTCs. In the grade 7 interactive *Monster Truck Pull*, within the Motion and Energy unit, students identify and investigate cause-and-effect relationships by launching a digital activity to see what happens when forces work against each other and how these forces impact the motion of the object.

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

- Yes, materials integrate digital technology that provides opportunities for teachers and/or students to collaborate. In Science Techbook, every concept features rich opportunities for peer-to-peer collaboration. Students have multiple opportunities to share models, explanations, and data with one another, allowing them to review their classmates' ideas and to obtain feedback on their own models, explanations, or data.
- Studio is a digital tool built into the program that allows student collaboration in an online setting. "Studio is a collaborative workspace where students can insert images and media content from the Discovery Education program to create presentations or demonstrate their applications of scientific and engineering practices. Student question boards, started in Engage, can be created in Studio and maintained throughout the concept as students refine their thinking. Teachers can also use Studio to develop and share content, support differentiation by varying lessons for individual or groups of students, and allow students to collaborate on whole-class assignments."
- Teachers have access to the Studio Help Center, where they can learn more about the collaboration tool and discover ways to integrate Studio into their teaching. Teachers need to enable chat for students to access it.

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

- Digital materials are accessible and compatible with multiple operating systems. For example, Single Sign-On Options include:
    - Google Single Sign-On
    - Office 365 Single Sign-On
    - ClassLink Single Sign-On
    - LDAP Single Sign-On
    - SAML/ADFS Single Sign-On
    - NCEdCloud Single Sign-On (NC Only)

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- Digital materials are accessible and compatible with multiple operating systems. For example, Learning Management System integrations include:
    - Canvas & Discovery Education
    - Schoology & Discovery Education
    - Google Classroom & Discovery Education
    - Microsoft Teams & Discovery Education
    - Brightspace by D2L, and Discovery Education
- Digital materials are accessible and compatible with multiple operating systems. For example, Data Syncing Management options include:
    - Google Technical Requirements
    - Clever Secure Sync (SSO and Rostering)
    - PowerSchool AutoSend for Discovery Education
- Digital materials are accessible and compatible with multiple devices, broken down by computers or tablet/mobile devices. For example, the Discovery Education System Recommendations page shows for Computers: “Discovery Education works on desktop and laptop computers with a wide range of browsers. We recommend you use the most recent version of the following browsers to ensure the best experience: Google Chrome, Mozilla Firefox, Safari, and Microsoft Edge. Downloading the most recent version of a browser means you'll always have access to our latest and greatest features. While some features may be inaccessible, we won't stop you from accessing our site with an out-of-date browser.” For tablet and mobile devices, the page states: “While we don't support specific devices by name - we do ensure that our products work with devices using the most recent version of the following Operating Systems: ChromeOS, Android, iOS. What does this mean for you? If you use a device, for instance, an iPad, that has one of these operating systems then Discovery Education should work on your device.”

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Indicator 9.3

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

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

Not Scored

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

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

Evidence includes but is not limited to:

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

- The digital technology and online components are developmentally appropriate for the grade level.
- The digital technology and online components are aligned with the grade-level scope and approach to science knowledge and skills progression. For example, materials provide related TEKS and English Language Proficiency Standards (ELPS) for online and digital components within the Standards Alignment resources for each unit.
- The digital technology and online components are aligned with the grade-level scope and approach to science knowledge and skills progression. For example, the scientific content studied in the Describing Motion concept aligns with the student expectation as labeled (7.7A). The learning material proves reasonable to study in the given time frame of forty-five minutes in each lesson in the Describing Motion concept.

Materials provide teacher guidance for using embedded technology to support and enhance student learning.

- Materials provide teacher guidance for using embedded technology to support and enhance student learning. For example, the Educator Support section provides professional learning videos and articles on topics from how to navigate the Science Techbook, to a step-by-step

guide for ways to utilize materials in various Learning Management Systems, to videos and supports on instructional strategies.

- Materials provide teacher lesson plans that help guide teachers through a lesson that has embedded technology. For example, in the grade 7 interactive lesson *Colossal Fossil Jostle*, within the Dynamic Earth and Space unit, students launch a virtual lab. The Lesson Planning document includes instructions for the teacher to guide students in their use of the embedded technology. “Next, allow students to work with partners or groups to follow the directions to explore the interactive and collect data. 1.Scroll over a fossil and read the description that appears. 2. Make a prediction about the layer the fossil would appear in based on its age. 3. Place the fossil in the appropriate rock layer to check your prediction. 4. Read the information that appears about the fossil. 5. Record the age, name, and interesting facts about the fossil in the data table. Then, record a quick sketch of the fossil. 6. Repeat the steps for each fossil.” Materials provide answers to the work students complete in the virtual lab.

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

- Materials include resources for parents and caregivers on how to support student engagement with digital technology and online components. For example, the Caregiver Course Overview, located in the Techbook’s Course Materials, provides unit-specific information, including ways to integrate learning into the home environment, such as a unit summary, key vocabulary, unit phenomenon, and home connections.
- Materials provide a letter with tips for families on how to support appropriate student engagement with digital and online components. The Parent/Guardian letter, located in the Techbook’s Course Materials, includes information on how to access program features at home. "Within this Student Edition, you’ll find QR codes that take you and your student to a corresponding online lesson of Science Techbook for Texas. Once in Techbook, students will have access to the Core Interactive Text of each concept, as well as thousands of resources and activities that build deep conceptual scientific understanding. Additionally, tools and features such as the Interactive Glossary and text-to-speech functionality allow Science Techbook for Texas to target learning for students of a variety of abilities."