McGraw Hill Texas Biology

McGraw Hill Texas Biology Executive Summary

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

TEKS Student %	TEKS Teacher %	ELPS Student %	ELPS Teacher %
100%	100%	100%	100%

Section 2. Instructional Anchor

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

Section 3. Knowledge Coherence

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

Section 4. Productive Struggle

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

Section 5. Evidence-Based Reasoning and Communicating

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

Section 6. Progress Monitoring

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

McGraw Hill Texas Biology

Section 7. Supports for All Learners

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

Section 8. Implementation Supports

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

Section 9. Design Features

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

McGraw Hill Texas Biology

Indicator 2.1

Materials are designed to strategically and systematically integrate scientific and engineering practices and course-level content as outlined in the TEKS.

1	Materials provide multiple opportunities for students to develop, practice, and demonstrate mastery of appropriate scientific and engineering practices as outlined in the TEKS.	M
2	Materials strategically and systematically develop students' content knowledge and skills as appropriate for the concept and grade level or course as outlined in the TEKS.	M
3	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 develop an understanding of science concepts.	M

Meet | Score 4/4

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

Materials provide multiple opportunities for students to develop, practice, and demonstrate mastery of appropriate scientific and engineering practices as outlined in the TEKS. Materials strategically and systematically develop students' content knowledge and skills as appropriate for the concept and grade level or course 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 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 appropriate scientific and engineering practices as outlined in the TEKS.

- The materials provide multiple opportunities for students to develop, practice, and demonstrate mastery of appropriate scientific and engineering practices (SEPs) outlined in the TEKS by integrating summative STEM Projects at the end of each chapter. For example, in Chapter 15, Genetic Technology, students identify a problem faced by a certain species, hypothesize a trait that would benefit the species, then use content knowledge from the chapter to develop a model of how genetic technology could benefit the species. Each STEM Project provides opportunities for students to demonstrate mastery of multiple SEPs.
- Lessons also provide opportunities to practice SEPs. For example, in Chapter 0, Lesson 4, Representing Data, the materials present circle, bar, and line graphs. This lesson asks students to describe the evidence suitable for bar graphs. This task supports students' mastery of the SEP analyzing and interpreting data. Also, in Chapter 22, Introduction to Plants, Lesson 2, the material includes an image of a cactus plant to introduce the phenomenon for the lesson that is connected to the standards of engineering practices. Specifically, in the Explore section, students work with the SEP Developing and Using Models. In this section, students construct models of different cell types and explain the functions of each cell, comparing them to the

cactus picture to help establish the connection to the phenomenon. For example, the curriculum materials provide multiple opportunities for students to develop, practice, and demonstrate mastery of appropriate engineering practices as outlined in the TEKS. For example, in Chapter 0, Process of Science, the Lesson 4 Blueprint shows SEPs-linked Planning and Carrying Out Investigations embedded in the curriculum materials for teachers to choose from.

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

- Materials strategically and systematically develop students' content knowledge and skills as appropriate for the concept and grade level or course outlined in the TEKS. This is evident in the Standards Performance Report, a tracker that allows teachers to monitor the development of students' content knowledge and skills as they progress through the course. The tracker provides a color-coded report on each student's content knowledge of the concepts outlined in the TEKS. This allows teachers to strategically develop students' knowledge and skills by addressing improvement areas.
- This strategic and systematic structure is seen in the chapter lessons of the material. For example, in Chapter 2, Principles of Ecology, students understand the biosphere more deeply. Specifically in Lesson 2, students are introduced to Earth's spheres (e.g., geosphere, hydrosphere, and biosphere) by reading about interactions between organisms in the biosphere and considering threats to biodiversity and how to preserve it. Furthermore, the beginning of each chapter includes a Chapter Launch that includes a preassessment of students' prior knowledge. The following description explains what prior knowledge needed for continued content knowledge development in the forthcoming chapter. For example, Chapter 9, Energy of Life, Chapter Launch, references prior knowledge of chemical reactions, which builds on chemistry concepts (i.e., chemical bonding) discussed in Chapter 7, Chemistry of Life. Also, in Chapter 23, Introduction to Animals, Lesson 1, Teaching Lesson 1 with the 5E Options, the Elaborate section includes a systematic approach to help the teacher develop student knowledge and skills by connecting previously learned content. The teacher uses the student's previous knowledge to help support the introduction of new content by creating a scaffold.
- The materials also provide strategic and systematic development of students' content knowledge and skills by implementing phenomena. For example, in Chapter 14, Genetics, students are presented with a phenomenon in the driving question, "Why does this pigeon have large feathers on its feet?" The teacher is then instructed to have students explore the inheritance of traits and inheritance patterns of basic Mendelian and complex non-Mendelian genetic traits. As the unit progresses, students explore, explain, and elaborate on their learning by referring to the anchoring phenomenon to more fully answer the driving question using their newly acquired knowledge.

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 develop an understanding of science concepts.

- Materials include opportunities, as outlined in the TEKS, for students to ask questions, plan and conduct classroom, laboratory, and field investigations, and engage in problem-solving to develop an understanding of science concepts. This can be seen throughout all chapters as each begins with an engaging phenomenon to spark students to ask questions, followed by an exploratory laboratory experience and opportunities to elaborate and extend their knowledge

of the concept. For example, in Chapter 12, Cell Cycle, students are presented with the phenomenon, "How can an immortal jellyfish reverse the course of its life cycle?" The Chapter Planning and Support page suggests after presenting the phenomenon. Teachers should have students take a pre-assessment, followed by a science probe worksheet activity, a video about the cell cycle, a BioLab: "Who do cells divide?" and "Does sunlight affect the cell cycle in yeast?" Finally, teachers are instructed to close the chapter by returning to the driving phenomenon question and completing the STEM Project: Develop an Algae Bloom. Also, Chapter 24, Animal Diversity and Behavior, contains the anchoring phenomena on the first page. The phenomenon is an image of a toad. After viewing the image, students develop questions about what they observe.

- Opportunities for students to ask questions can also be found throughout the materials. For example, in Lesson 2 of Chapter 24, under Teaching Lesson 1 with the 5E Options, in the Engage section, there is an Ask Yourself activity that prompts students with a question about their prior knowledge. This prior knowledge activation strategy encourages students to ask further questions about the content. In answering their questions, students are utilizing cross-content strategies when writing down possible answers to their questions.
- Opportunities for students to conduct investigations can be found in the Lab Library. The Lab Library includes 27 Quick Labs for students to conduct investigations. Some labs, such as "What solutions or substances act as buffers?" allow students to plan the investigation (e.g., choosing a solution, designing a procedure to test the solutions, and organizing a data table). The Quick Labs include objectives and pose questions to students, and the lab procedures support students' conducting the labs.
- The program provides a variety of laboratory activities for student engagement, as well as the opportunity for students to develop their own questions. McGraw Hill recognizes that a variety of lab experiences are necessary in the day-to-day classroom setting, from procedural labs to open-ended science and engineering design activities. The Applying Practices activities allow students to approach a unique situation that requires them to ask questions, define problems, and design solutions. As outlined in TEKS 1B, students must "apply scientific practices to plan and conduct descriptive, comparative, and experimental investigations."

McGraw Hill Texas Biology

Indicator 2.2

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

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

- The materials embed phenomena and problems across lessons to support students in constructing, building, and developing knowledge through authentic application and performance of the science and engineering practices and course-level content outlined in the TEKS. For example, each lesson is guided by an essential question connected to phenomena presented at the beginning of the Chapter. In Chapter 5, Biodiversity and Threats, the essential question for Lesson 2 is, "What are some factors that threaten Earth's biodiversity?" Students consider the essential question in the context of monarch migration. Students then identify threats to migration and suggest ways scientists could minimize these threats along monarch migration routes. Through discovering answers to the essential question, students can perform scientific engineering practice SEP.1.A, "ask questions and define problems based on observations or information from text, phenomena, models, or investigations," and deepen their knowledge of environmental change TEKS 13.D.
- Another example of how the material allows students to develop knowledge through authentic application can be found in each chapter's cover, which depicts a phenomenon related to its contents. For example, Chapter 10, Photosynthesis and Cellular Respiration, shows different

types of lettuce grown indoors in a hydroponic system and lists the driving question, "How can we use the processes of photosynthesis and cellular respiration to our advantage?" This is one of many examples of the material's embedded phenomena and engineering problems that support students in constructing and developing knowledge through the authentic application of SEPs as outlined in TEKS 1, which requires students to "answer questions, explain phenomena, or design solutions" to problems. Another example is found in Chapter 26, Human Body Systems Part 1, where students view an image that depicts a phenomenon of an individual with a disability playing tennis, which is the driving anchor for the chapter. Each lesson also provides a phenomenon that anchors the lesson. For example, in Lesson 2 of Chapter 26, the material provides an image of Olympic ice skaters with the essential question, "Why do you breathe faster when you work out?" These examples provide real-world scenarios at the unit and lesson levels. The phenomenon is an entry point for students to explore further utilizing the science and engineering performance standards.

- Curriculum 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 and course-level content as outlined in the TEKS. For example, in Chapter 8, Cellular Structure and Function, the chapter begins with exploring the phenomenon "How is structure related to function in a cell?" with an Interactive Case Exploration: Cellular Structure and Function. SEPS and content TEKS can be found at the beginning of the chapter in the Chapter Overview, TEKS at a Glance. For example, in Chapter 8, Cellular Structure and Function, the TEKS at a Glance shows 4.B, 5.A, 5.B, 5.C, and 11.B covered throughout the chapter.

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

- The materials intentionally leverage students' prior experiences related to phenomena. For example, Chapter 0, What is Science? Lesson 1, introduces a US map of COVID-related search queries regarding loss of taste and smell. Teachers ask students to describe how the data could be used to help the local community. This invitation leverages students' prior experiences with COVID-19 to explain how scientists collect and use data.
- Furthermore, each lesson blueprint contains an activity called Activating Prior Knowledge. These activities build upon prior knowledge from the course and knowledge from previous years. For example, in Lesson 1 of Chapter 14, Genetics, the Blueprint has students identify homologous chromosomes and phases of meiosis 1, which is knowledge students have gained from Chapter 12, Cell Cycle.
- The materials intentionally leverage students' prior experiences related to phenomena and engineering problems. For example, in Chapter 4, Population Ecology, prior knowledge is leveraged through phenomena of the effects of fungal infections, such as white-nose syndrome in tri-colored bats, on food webs. Chapter 4 also includes engineering problem activities embedded to leverage students' prior knowledge in scientific practices and experiences, such as the STEM Project: Comparing Yeast Population Sizes.
- The material also elicits and leverages students' background knowledge and experience to adequately address misunderstandings. For example, in Lesson 1 of Chapter 26, the TEKS Progression outlines what students already know about the content by reviewing the previously learned TEKS 7.13.A. If a student needs support for misconceptions or recalling prior knowledge, the material provides a digital Reteaching Library to revisit the background knowledge.

McGraw Hill Texas Biology

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

- The materials clearly outline the scientific concepts behind each phenomenon for the teacher. Multiple lesson investigations often work together to connect to a single phenomenon and/or problem to develop an understanding of corresponding grade-level concepts. As students engage in the various types of investigations, they are given the opportunity to develop a deeper understanding of the engineering design cycle as they apply grade-level scientific concepts to the design problem. For example, in the Chapter Planning and Support section that precedes the lessons in each chapter, there is a sample answer to the driving question. In Chapter 2, Principles of Ecology, the driving question is, "Why are Brazilian coral reefs important to the study of ecology?" The Teacher Edition includes a sample response that describes the relative scientific concepts (i.e., "by studying the reefs, ecologists gain a better understanding of the key concepts of ecology"). Also, in Chapter 4, Population Ecology, teachers are provided with a variety of activities to create their lesson plan, or they can use the suggested 5E lesson plan provided. Both options provide clearly outlined scientific concepts and goals behind each phenomenon and the engineering problem. Chapter 4 phenomenon goals state, "This tri-colored bat is infected with a disease called white-nose syndrome… Although not transmissible to other animals… this fungus still affects other populations by decreasing the number of bats available as pollinators and in the food chain."
- The materials clearly outline the scientific concepts behind each engineering problem for the teacher. This is evident in the engineering challenges in each chapter's Teaching Lesson section. Throughout the course, these materials clearly outline the scientific concepts and learning goals behind each engineering problem. For example, the Lesson 3 Teaching subsection of Chapter 18, Speciation and Extinction, challenges students to design models of cladograms. Materials outline the relevant concepts and learning goals behind this engineering problem by relating them to the lesson's content knowledge. Furthermore, in Chapter 26, Human Body Systems, in the About the Photo section, the material explains the phenomenon that is given to help support the teacher's instruction by providing the science concepts that the chapter will cover.

McGraw Hill Texas Biology

Indicator 3.1

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

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

Evidence includes but is not limited to:

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

- The materials are designed for students to build and connect their knowledge within and across units. The materials provide vertical alignment by connecting the TEKS within a chapter to the TEKS students were introduced to in middle school. This can be seen in each chapter of the Teach eBook in the "TEKS Progression" section. The "TEKS Progression" is located at the beginning of each chapter and lists the TEKS that will be covered along with the prior knowledge related to that chapter. For example, the TEKS Progression section of Chapter 7: Chemistry of Life, pg 313, lists the 8th-grade TEKS 8.6.A "Explain by modeling matter is classified as elements, compounds…" concept builds to TEKS 5.A "Relate the functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids, to the structure of a cell." This prior knowledge allows students to build and connect their knowledge and skills from one year to the next.
- The materials also allow students to make connections across units. For example, Chapter 11: DNA Structure and Gene Function, under "TEKS at a Glance," pg. 518, the TEKS 7.A, 7.B, and 7.C are listed, indicating that students will learn about DNA structure, Transcription and Translation, and Gene Regulation and Mutations. Then in Chapter 15: Genetic Technology, on page 702, under the section "Prerequisite Knowledge," "DNA replication," and "transcription and translation" are listed as concepts that students should know to be successful in this chapter. Furthermore, this can be seen in Chapter 10: Photosynthesis and Cellular Respiration, under the

"TEKS at a Glance" section, which provides teachers guidance on prerequisite knowledge, such as chemical equations, homeostasis, and eukaryotic and prokaryotic cells, which were introduced in previous units, Chapter 7: Chemistry of Life and Chapter 8: Cellular Structure and Function on the course materials. The prerequisite knowledge gained in chapters 7 and 8 sets the stage for students to recognize the relationship between photosynthesis and cellular respiration, the products of one chemical reaction being the reactants of the other, and the importance of membrane-bound organelles found in eukaryotic cells, to organisms maintaining homeostasis.

- The material was also designed for students to build and connect their knowledge and skills within a unit. For example, in Chapter 0, Lesson 3, students read about the work of historical and current contributions of women and People of Color, including Dr. Kizzmekia Corbett, who helped develop the SARS-CoV-2 vaccine. This builds on students' previous reading in the same unit (Chapter 3, Lesson 0) about science as a body of knowledge and the many contributions that have shaped how we think about the natural world.

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

- The Materials are intentionally sequenced to scaffold learning in a way that allows for increasingly deeper conceptual understanding. This can be seen in the way the chapters are sequenced. The suggested sequence allows students to gain an ever-increasing conceptual understanding of the course. For example, Chapter 2: Principles of Ecology, is followed by Chapter 3: Biomes, Ecosystems and Communities, Chapter 4: Population Ecology, and the concepts in each of these chapters are combined in Chapter 5: Biodiversity and Threats, where students explore biodiversity and threats to biodiversity. In this sequence, students can deepen their conceptual understanding of ecology and current threats to biodiversity within ecosystems.
- The sequence of materials scaffold learning at the chapter level, where teachers are provided an opportunity to build on students' prior knowledge before teaching new content occurs. Chapters often begin with lessons that activate prior knowledge from the previous chapter. For example, Chapter 10: Photosynthesis and Cellular Respiration begins its first lesson with a "True or False" activity, where students respond to questions about mitochondria. This builds off the knowledge from Chapter 9: The Energy of Life, in which students learned how enzymes enable the chemical reactions that sustain life, and knowledge from Chapter 8: Cellular Structure and Function, in which students were first introduced to mitochondria.
- The materials are also intentionally sequenced to deliver each lesson through the 5Es. This approach allows teachers to support students in systematically, coherently, and accurately building knowledge. For example, in Chapter 15: Genetic Technology, in Lesson 1 under the section "Teaching Lesson 1 with 5E Options," the material includes a scaffolded approach to introduce concepts to students where they gradually deepen their conceptual understanding. In the Engage, students are asked, "What tools do genetic Engineers use?" and are asked to answer using the CER method. Then students explore the selective breeding of an organism of their choice and use an interactive to explain how DNA technology is changing the world. Students elaborate on their knowledge by "determining a person's Human Leukocyte Antigen (HLA) to see if there is a match or an organ donor by using PCR?" and are evaluated through daily Exit Tickets.Furthermore, in Chapter 9: The Energy of Life, students are engaged with the essential question, "What types of energy are found in cells, and how is energy converted in cells?" and make an initial claim answering the essential question, followed by an explore

activity in which students write out what they ate for breakfast and research the calories for each food item. The explain activity then has students create an infographic for potential and kinetic energy, elaborating by revisiting their engaged CER, providing evidence from what they have learned, and revising their claim, if needed. Finally, the chapter is closed with an exit ticket in which students answer the prompt, "What two types of energy make up the total energy in an object, and how can that energy be measured."

Materials clearly and accurately present course-specific core concepts and science and engineering practices.

- The materials clearly and accurately present course-specific core concepts. For example, in Chapter 3: Biomes, Ecosystems, and Communities, in Lesson 2: Water on Earth, covers TEKS 13.D "Explain how environmental change, including change due to human activity, affects biodiversity and analyze how changes in biodiversity impact the ecosystem stability." The lesson opens with the Engage, where students are asked, "How does environmental change affect the biodiversity and ecosystem stability of aquatic biomes?" Then students are shown two side-by-side pie charts; the first shows the percentage of saltwater vs. freshwater, and the second shows the percentage of freshwater frozen in glaciers vs. lakes, rivers, and groundwater. These images are then connected to the explain section, where students gain an understanding of fresh and saltwater biomes and how humans and climate impact these ecosystems. Then students revisit their CER question in the Elaborate section, where they are asked more probing questions, such as, "What are some reasons that mountain springs and streams are usually clearer, colder, and more oxygenated than rivers?" This lesson clearly and accurately represents environmental change as stated in TEKS 13.D. Furthermore, in Chapter 18: Speciation and Extinction, in Lesson 2, under the section "Teaching Lesson 2 with the 5E Options," the Elaborate section states that students will "research and write a brief report on an extinct organism." This activity addresses the SEP standard, TEKS 8.1.1, "Ask questions and define a problem based on observation or information from text, phenomena, models, or investigations." The SEP activity presents guiding questions for students to follow when conducting their investigations. At the end of each lesson, the material provides a road map that includes resources to the teacher to differentiate instruction for various learners.
- This clarity can also be seen in each chapter's TEKS at a Glance section. For example, in Chapter 22: Introduction to Plants, the TEKS at a Glance page guides course-specific core concepts and science and engineering practices covered in the chapter of study as well as prerequisite knowledge necessary for the unit.
- Materials also provide clear instructions for science and engineering practices. Each student handout for laboratory investigations lists TEKS addressed in the activity. Most labs list the specific content TEKS involved. For example, Quick Lab: Flow of Energy in Ecosystems lists that it addresses TEKS 13.B. Labs also lists which SEPs are most involved in the lab activity. For example, BioLab: Design Your Lab: How does the external stimulus of light affect behavior? addresses 1.A, 1.B, 1.C, 1.D, 1.E, 1.F, 2.B, 2.D, 3.A, 3.B, and 4.A. This explicit list of TEKS at the top of each lab activity clearly and accurately presents course-specific science and engineering processes.

McGraw Hill Texas Biology

Mastery requirements of the materials are within the boundaries of the main concepts of the course.

- Materials clearly define the boundaries of the main concepts that students must master for the course by identifying what material is beyond the scope of the course. For example, the Table of Contents lists that in Lesson 3 of Chapter 13, Errors in Meiosis is "Beyond the TEKS." This sets the boundary for the course's main concepts by identifying what information is within the boundaries of the course and what information is outside the boundaries of the course.
- Furthermore, each chapter and lesson begin with the TEKS that will be addressed in that portion of the material, and assessments are consistent with the course concepts identified in the TEKS. For example, in Chapter 4: Population Ecology, in Lesson 1: Population Dynamics, students "investigate and evaluate how ecological relationships ... impact ecosystem stability," TEKS 13A. This is consistent with the assessment, an exit ticket, with students identifying density-dependent and independent factors that might limit populations.
- Another example of the mastery requirements being within the boundaries of the main concepts can be found within each lesson's essential question. The essential question provides guidance for students' content success criteria for mastery. In the Student eBook: Chapter 20: Bacteria, Archaea, and Viruses, Lesson 2's Essential Question, "What are the differences between the domains of prokaryotes?" indicates mastery for this lesson.
- Finally, the "TEKS at a Glance" section, found at the beginning of each chapter, lists the TEKS and concepts covered and a "Chapter Overview" with all essential questions for the study chapter. For example, in Chapter 22: Introduction to Plants, the "TEKS at a Glance" list the 3 TEKS 9.A , 12B, and 13A, and the driving questions, "What adaptations of plants help them survive on land? What are the major plant cells, tissues, and organs, and their functions?" "What structures do plants use to reproduce, and how do they function?" and "How are plants classified?"

McGraw Hill Texas Biology

Indicator 3.2

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

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

Meets | Score 6/6

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

Materials support teachers in understanding the vertical alignment of course-appropriate prior knowledge and skills guiding the development of course-level content and scientific and engineering practices. Materials contain explanations and examples of science concepts, including course-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 vertical alignment of course-appropriate prior knowledge and skills guiding the development of course-level content and scientific and engineering practices.

- The materials support teachers in understanding the vertical alignment of course-appropriate prior knowledge guiding the development of course-level content. Each lesson within the chapters begins with a "TEKS Progression" that identifies how students' prior learning guides "their learning as they progress in their development of scientific knowledge." For example, in Chapter 5: Biodiversity and Threats, Lesson 1: Biodiversity, the "TEKS Progression" supports teachers in understanding vertical alignment by identifying the Grade 8 TEKS, 8.12C, which requires students "explain how biodiversity contributes to the stability and instability of an ecosystem ..." will guide students as they "explain how environmental changes, including change due to human activity, affect biodiversity" (TEKS 13.D). The TEKS Progression, located in Chapter 14: Genetics, Lesson 1: Mendelian Genetics, the prior knowledge includes TEKS 8.13.B, "Describe the function of genes within chromosomes in determining inherited traits of offspring." This prior knowledge is vertically aligned with Biology TEKS 8.B, "Predict possible outcomes of various genetic combinations using monohybrid and dihybrid crosses including non-Mendelian traits of incomplete dominance, codominance, sex-linked traits, and multiple alleles."

- The materials also support teachers in understanding vertical alignment of course-appropriate prior knowledge and skills, as evidenced by the "Lesson Overview." This section of each lesson includes a "Science Background" section that explains the prior knowledge and skills students should have mastered in previous grades or in previous chapters and connects it to new learning in the lesson. For example, Lesson 1 of Chapter 10 describes the process of photosynthesis, organisms that undergo photosynthesis, and the organelle in which photosynthesis occurs. This connects learning to prior knowledge from Chapter 9: The Energy of Life, Chapter 2: Principles of Ecology, and Chapter 8: Cellular Structure and Function.
- The materials also support teachers in understanding the development of scientific and engineering principles. Each Chapter begins with an overview of "Chapter Digital Resources" that precedes "Chapter Planning and Support." When STEM projects are listed, the Digital Resource overview lists the resources in each lesson that support students in the culminating STEM project. For example, in Chapter 6: Preserving Biodiversity, students design a solution to preserving biodiversity in national parks. The "Chapter Digital Resources" for Lessons 1-3 lists multiple opportunities for Applying Practices, including Modeling Relationships, Resource Management, Human Sustainability, and Cleaning Oil Spills. These resources support teachers in guiding students' development of SEPs.

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

- Materials contain explanations and examples of science concepts that support teachers' subject knowledge in three areas: "Lesson Teaching," "Chapter Planning and Support," and "Driving Questions."
- The "Lesson Teaching" subsection of each lesson provides multiple examples of correct responses to questions about concepts within the lesson. For example, Teaching Lesson 1, within Chapter 2: Principles of Ecology, guides teachers to have students "brainstorm what kinds of organisms might live in a coral reef ecosystem" and provides correct examples, including "fish, turtles, sharks, plankton, or plants." By providing an array of correct student responses, materials support teachers' subject knowledge of essential concepts within each lesson.
- The "Chapter Planning and Support" section of the material includes Science Probes that are used to address preconceptions students may have. For example, located in Chapter 19: Origin and History of Life, under the section "Chapter Planning and Support," there is a Science Probe that the teacher uses to address preconceptions of the content. For example, the Science Probe offers the following explanation to teachers, "This formative assessment worksheet explores the question: How could science be used to help people live on Mars?" to uncover students' preconceptions about measurements and data as students consider the answer to the question. Common preconceptions include that accuracy and precision mean the same thing and that all laboratory measurements are both accurate and precise."
- This can also be seen in each chapter in the driving question. Driving questions are rooted in a phenomenon with detailed information for the teacher via the "About the photo," chapter overviews with essential questions for each lesson, and a science background for each lesson overview that provides examples of science concepts and driving question connections. For example, Chapter 23: Introduction to Animals, Lesson 1: Characteristics of Animals provides teachers with the chapter phenomenon of the nine-banded armadillo with the driving question "What makes an animal, an animal?" provides an "About the photo" section that elaborated on the phenomenon of the nine-banded armadillo, followed by a chapter overview, and lesson

overview and lesson blueprint guidance. Also, in Chapter 7: Chemistry of Life, in Lesson 1: Matter, the Engage section directs the teacher to elicit students' prior ideas by asking, "What makes up everything around you, including what you eat and drink?." The accompanying teacher resources suggest students might respond with an atom or cell and ask that teachers use students' responses to identify potential misconceptions. This section also helps teachers recognize potential barriers to students' conceptual development; in this case, Emergent Bilingual (EB) supports that precede the first lesson suggest that teachers help students identify cognates and false cognates relative to the concepts outlined in the TEKS.

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

- Materials explain the intent and purpose of the instructional design of the program. This is evident in looking at the "Program Overview," which explains the purpose of the program and the rationale for its structure. This document explains the rationale for the use of the 5E model of instruction, stating it "allows for a clear, recommended path to cover the TEKS with flexibility throughout the lesson to deliver the content that best fits the classroom's needs." The "Program Overview" also explains that "students are the center of the learning experience" and provide "teachers the guidance to cover the newest version of the TEKS while building success on the STAAR test." This specifically identifies the intent and goals of the program. The Program Overview also contains language such as "For Every Student," "For Every Learner," "For Every Scenario," "For Every Teacher," and "McGraw Hill Texas Science offers a rich ecosystem of resources, allowing teachers to cover the TEKS content they need, the way they want with the support to meet all students' needs."
- The curriculum materials also explain the intent and purpose of the instructional design of the program by utilizing the 5e instructional framework and the "Chapter Planning Guides." For example, in Chapter 18: Speciation and Extinction, in Lesson 1: Speciation, the Blueprint shows the 5e lesson breakdown of options and a customizable lesson option followed by the "Teaching Lesson 1 with 5e Options" activity description of activity intent and purposes. Examples of "5E Options" for the Engage portion of the chapter include a CER over speciation to answer the essential question "What is speciation and how does it work?" Activate Prior Knowledge activity by asking students ."..how two populations of the same species might evolve different adaptations." and a Reading Strategy in which students ."..use their background knowledge to infer the meaning of the two terms (prezygotic and postzygotic) and write responses on the board."

McGraw Hill Texas Biology

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 course-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 course-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.

- Students engage in meaningful sensemaking while acting as scientists and engineers through the behaviors outlined in the Program Overview. Example behaviors include providing students opportunities "to ask questions, pose hypotheses, conduct hands-on experiments, and communicate their findings." Furthermore, inquiry is listed as the driving factor for students to develop understanding, mastery of TEKS, and appreciation for learning.
- These behaviors are evident throughout the material. For example, in Chapter 0: The Process of Science, Lesson 4, Science and Engineering Practices, students read about eight science and engineering practices, including "planning and conducting investigations." The practice description helps students think like scientists by asking them to consider several questions when designing an investigation, e.g., "How much data needs to be collected ...?" and "What tools should be used to collect data?"

- Furthermore, Chapter 22: Introduction to Plants begins with the driving question, "How does a plant's structures support its life functions?" is paired with the phenomenon of the spoon-leaf sundew, a carnivorous plant. Throughout the chapter, students read the lesson science backgrounds over the evolution of plants, watch short videos about the evolution of plants, and write responses to essential questions associated with each lesson, such as "What adaptations of plants help them to survive on land?," and a STEM Project in which students discuss "How Plants Enhance Quality of Life."
- The materials also support students' meaningful sense-making by acting specifically as engineers. An example is found in Chapter 9: Lesson 2 within the Elaborate section. In this section, students work with a partner or small group to design an experiment that would produce evidence to support the law of conservation of energy. Students are first given the law, then asked to think about the evidence that would support the law, then work collaboratively to design an experiment to produce such evidence. As students work, the teacher poses questions to guide critical thinking, such as "where in the experiment are energy changes occurring?" and "what kind of energy is dissipating?" Collaborative group work focusing on student-driven inquiry allows students to act as scientists and engineers, supporting the development of meaningful sensemaking.

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

- The 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 students with questions after sections of text, prompting students to use text as evidence to develop better conceptual understanding. For example, in Chapter 12: Cell Cycle, Lesson 1: DNA Replication, students read a series of introductory paragraphs and look at an image. Then students are asked to "Explain how semiconservative replication conserves half of the original DNA molecule." This question prompts students to read over the text and inspect the related diagram to gather evidence and understand the concept of semiconservative replication. Such questions posed throughout the text provide multiple opportunities for students to engage with that text by gathering evidence to develop a deeper understanding of the concepts presented.
- Another example is in Chapter 5: Biodiversity and Threats, Lesson 2: Threats to Biodiversity; students read and gather evidence from Figure 13, a graph titled "Percentage of Species Threatened by Group." This figure, which depicts endangered and vulnerable vertebrates and invertebrates, is an example of a grade-appropriate text that helps students gather evidence about threatened species and develop a conceptual understanding of biodiversity and threats to biodiversity.
- Also, in the Student eBook: Chapter 19: Origin and History of Life, Lesson 1: Origin of Life has a reading about "Spontaneous generation." In this reading, students learn about the scientist Francesco Redi and his work of being the first to test spontaneous generation. Next, students observe images of two containers with rotting meat, one covered and the other not covered. Students observed and noticed that the container without a cover had maggot larvae after some time, and the one that was covered did not. This provides students with both text and the process of gathering evidence to solidify scientific concepts.
- In Chapter 24: Animal Diversity and Behavior, Lesson 1: Invertebrates, students watch a video of vocal communication in organisms and discuss "What are the characteristics of the toad and what behaviors are being demonstrated?" Students then read a scientific text about

invertebrates and answer guided questions. Next, students perform a laboratory experience in which they examine arthropods using microscopes and answer the questions "How do jointed appendages aid in movement? What would be an advantage of having feathery antennae?" and use a graphic organizer to compare and contrast lancelets and tunicates.

- In each of these examples, students are provided opportunities to engage with grade-level appropriate scientific texts by gathering evidence and developing an understanding of biological 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.

- The materials provide multiple opportunities for students to engage in various written and graphic modes of communication to support students in developing and displaying an understanding of scientific concepts. For example, in Chapter 4: Population Ecology, Lesson 2: Population Growth, students engage with written and graphic modes of communication to develop and display an understanding of exponential growth. Students imagine how many rice grains would cover a chessboard in which 1 square has 1 grain of rice; the next has 2 grains of rice, the next has 4 grains of rice, etc. They then examine the exponential growth curve of a mouse population. The teacher graphs the lag phase using a y-axis scale appropriate for showing the early growth. Finally, students read about reproductive strategies and prepared a table that compares r- and k- strategists. These multiple opportunities to engage in various communications support students' understanding of population growth patterns.
- Materials provide multiple activities for each lesson and various methods that allow students to demonstrate mastery. For example, in Chapter 11, the Engage section of Lesson 1 tasks students to construct an initial claim-evidence-reasoning argument, which allows them to display their understanding of DNA and its function through writing. Next, in the Explain section (page 531 of 1269), students work in groups to create a comic about the Hershey-Chase experiment, allowing them to develop and display an understanding of bacterial transformation. Providing various written and graphic modes of communication supports students in developing and displaying an understanding of scientific concepts.
- Additional opportunities can be seen in Chapter 14 within the activity "BioLab: What are the chances," where students draw a pedigree showing the family relationships, draw a Punnett square, and answer questions. In this activity, students focus on the science concepts of TEKS 1.F "Organize quantitative and qualitative data" using scatter plots, line graphs, bar graphs, charts, data tables, digital tools, diagrams, scientific drawings, and student-prepared models.
- Materials also supported students' development and display of understanding of scientific concepts by having students record their ideas, questions, drawings, charts, and graphs in their student notebooks. With these recordings, students can discuss and revise their understanding at various stages of the lesson. For example, in Chapter 25: Introduction to Human Body Systems, Lesson 1: Levels of Organization and Homeostasis, students write a CER to answer the essential question, "How does your body maintain homeostasis?" play Levels of Organization Bingo to "help students explore the levels of organization of the human body by playing BINGO... providing examples of cells, tissues, organs, and organ systems to students." and having students develop and diagram a negative feedback loop with specific information using increased body temperature as an example.

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

- Materials support students to act as scientists and engineers who can learn from engaging in phenomena and engineering design processes, make sense of concepts, and productively struggle. Within each chapter, the materials provide phenomena for students to investigate, allowing them to act as scientists who learn from inquiry, make sense of concepts, and productively struggle. After introducing the phenomenon, the materials provide an essential question to guide students' investigation and understanding of course concepts. For example, Chapter 8: Cellular Structure and Function begins with an image of Euglena alongside the question, "how is structure related to function in a cell?" Students investigate the phenomenon of this complex unicellular eukaryote's existence and revisit the essential question at the end of each lesson within the chapter. The structure of the unique Euglena allows students to productively struggle with the ideas of prokaryotes and eukaryotes, plants and animal cells, and motile and nonmotile cells. Phenomena such as these allow students to act as scientists who, from investigation and productivity, struggle to make sense of concepts within the course.
- The materials also include opportunities for students to act as engineers who can learn from the engineering design process to make sense of concepts and productively struggle. For example, in Chapter 20, the activity "BioLab: Can you filter out Cholera?" students design a filter to remove copepods from a river sample. In this activity, students use the Engineering Design Process (EDP) to identify a problem, copepods in river water. Next, students Explore materials that they will use to construct their filter. In the Designing stage, students sketch or model their filter design. In the final steps, students Create, test, and improve the filter design. For this activity, students communicate their findings to their classmates.
- Additionally, students are provided opportunities to act as scientists to make sense of scientific concepts. For example, in Chapter 5, Lesson 2, Quick Lab: Investigate Threats to Biodiversity, students "discuss some environmental changes that are threats to local ecosystems, choose one such factor and explain how it affects local biodiversity, brainstorm ways that this threat could be reversed or reduced, [and] with ... [they're] group, organize and communicate the information ... developed about threats to biodiversity and possible solutions." Obtaining, evaluating, and communicating scientific information is one of the science and engineering practices, so in this way, students act as scientists do to make sense of biodiversity threats.

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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 course.	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 course. 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 promote students' use of evidence to support their hypotheses. For example, in Chapter 0: The Process of Science, Lesson 1: What is Science?, in the Explore section, the materials instruct teachers to provide students with "sealed, shoebox-sized black boxes with different unknown items inside and ask students to identify what is inside. " Next, teachers should "Ask students to form a hypothesis about what the item could be, using their observations to support their reasoning." Another example can be found within lab activities which prompt students to create hypotheses from what they observed during the activity. For example, in the Lab Library, an activity titled "BioLab: How can you keep cut flowers fresh?" asks students to research strategies for "extending the life of cut flowers" and "why a specific strategy might be effective." Then students are prompted to "form a hypothesis based on [their] research."
- The materials prompt students to use evidence to support their claims. For example, in Chapter 14: Genetics, Lesson 2, in the section "Teaching Lesson 2 with 5E Options," the Elaborate has an activity titled "CER: Basic Patterns of Inheritance." In this activity, students use Claim, Evidence,

and Reasoning (CER) to answer the essential question, "How can inheritance patterns over generations be used to understand traits?." Students can support their answers to this question by providing evidence from the lesson. Another example is Chapter 26: Human Body Systems Part I, Lesson 2: Respiratory and Circulatory Systems in a Claim-Evidence-Reasoning activity within the Engage portion. The CER gives students a driving question stimulus "Why do you breathe faster when you work out?." Students are prompted to make their initial claims using the CER strategy. Students return to the CER during the Elaborate portion of the lesson. Students are directed to "..return to this activity to record their evidence, revise their claims, and explain their reasoning in answer to the essential questions...." The materials also include sample-appropriate answers.

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

- Materials include embedded opportunities to develop and utilize scientific vocabulary in context by providing support on how to use vocabulary in various ways, including but not limited to an interactive word wall. Each chapter contains a section called “Science Language and Content Acquisition” that begins with a link to Dr. Julie Jackson’s interactive word wall support, followed by a list of target vocabulary found throughout the chapter. Each chapter guides the use of the word wall to “help students gain an understanding of the target vocabulary within the context of the entire TEKS.” For example, in Chapter 15: Genetic Technology, the section “Science Language and Content Acquisition” lists key vocabulary for each lesson. The students build a visual word wall to help support vocabulary understanding. Furthermore, additional support is provided to increase exposure to key vocabulary, including the “Word Lab” and “Science Literacy Essentials.” Another example can be found in Chapter 24: Animal Diversity and Behavior, within the section “Science Language and Content Acquisition.” This section lists prior knowledge terms, lesson vocabulary, and supporting vocabulary broken down by lesson. The resources also include an interactive word wall to "..help students gain an understanding of the target vocabulary within the context of the entire TEKS.”
- The materials also embed opportunities to develop and utilize scientific vocabulary within the chapter’s key vocabulary. For example, the student eBook, Chapter 15: Genetic Technology, Lesson 1, has key vocabulary words that stand out to the student using a different color. This is a hyperlink that students click on, which provides the student with a definition of the word. The material also prompts the student with a question relating to the vocabulary word. In this example, the vocabulary word is “selective breeding,” the question is, “Explain how selective breeding can be used to develop dog breeds.” To answer the question, the student must first know the meaning of selective breeding, which is provided in the hyperlink. Also, in Chapter 24: Animal Diversity and Behavior, Lesson 1: Invertebrates have the key vocabulary words as clickable links in the student ebook that provides a definition, when clicked on, that can be translated into English or Spanish.
- Another location in the materials includes embedded opportunities to develop and utilize scientific vocabulary in context via questions within the text. These questions guide students to utilize vocabulary in their answers. The student textbook sprinkles questions throughout each lesson to help students utilize vocabulary in context. For example, in the Student Textbook, Chapter 8, Lesson 2: Structure of the Plasma Membrane, students are asked to “Describe the arrangement of the phospholipids in the plasma membrane.” This question guides the use of relevant vocabulary terms, like bilayer, hydrophobic, hydrophilic, aqueous, polar, non-polar, etc.

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

- Materials integrate argumentation and discourse throughout to support students' content knowledge and skills development as appropriate for the concept and course. One way the materials do this is by providing opportunities for students to develop how to engage in argumentation and discourse. For example, in Chapter 6: Preserving Biodiversity, Lesson 3: Conservation and Biodiversity Preservation, during the Explore phase of the learning cycle, students make an initial claim in response to the essential question, "What steps can we take to conserve and protect biodiversity?" using a Claims Evidence Reasoning (CER) format. During the Elaborate phase of the learning cycle, teachers ask students to "return to this activity to record their evidence, revise their claims, and explain their reasoning in answer to the original question" In this way, the materials help students learn how to engage in evidence-based argumentation and discourse.
- Another way the materials integrate argument and discourse can be seen within several labs that provide embedded opportunities for students to engage in scientific argumentation. For example, in BioLab: "How can surveying a plot of land around your school help you understand the health of your ecosystem?" question 4 asks students to "Engage in Scientific Argumentation: is there another possible conservation biology technique that could be used? Justify your response." Also, in Chapter 18: Speciation and Extinction, Lesson 2:Teaching Lesson 2 with 5E Options, the Engage section includes a discussion activity. This activity instructs the teacher to deliver the following prompt, "Ask the class to debate whether it is a good idea to reintroduce animals that have gone extinct." By encouraging student debate, the materials provide opportunities for students to share their different points of view and ideas and compare them to those of their peers. This strengthens their development of content knowledge and skills.

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 opportunities for students to construct and present developmentally appropriate written and/or verbal arguments that justify explanations to phenomena evidence acquired from learning experiences. The materials do this by providing opportunities for students to justify explanations using evidence from learning experiences. Many labs implemented in the latter portion of each 5E lesson are "BioLabs," longer labs that tie in multiple portions of content knowledge from the lesson. BioLabs often have students construct an argument using evidence gathered during the procedure.
- For example, in Biolab: "The Missing Restaurant Owner," students use evidence from the description of a crime, blood type analysis, and DNA analysis to construct an argument about the scenario, then prompts students to "form groups of four students" in which "two students should act as prosecutors while the other two act as defense attorneys" and argue about the suspect's guilt or innocence. In this example, students use multiple pieces of content knowledge to construct and present their solution to a problem.
- Another example is found in Chapter 4 BioLab: "Do plants of the same species compete with one another?" students "collect and analyze data on plant specimens to investigate the intraspecific competition." Next, students construct a graph and calculate the best-fit line to show that the average plant biomass decreases as the planting density increases." Students then use this

information to answer the question, "What was the effect of plant population density on the average plant biomass? Does your graph support your hypothesis?." In this way, students must present a developmentally appropriate written argument to justify their explanation of the phenomena.

- Furthermore, in Chapter 27: Human Body Systems Part II, in Lesson 1, students are asked to provide verbal and written arguments to justify explaining phenomena. The lesson begins with an Explain activity that activates students' prior knowledge by asking them to verbally recall the levels of organization of living things. Next, in the Explore section, the curriculum materials have students explore action potential using a quick demo with dominoes, and students create a written response to answer the prompt, "How does this resemble an action potential?." In the Explain section, students utilize the "Vocabulary Word Lab" to examine and practice vocabulary and then create a written response to the driving questions in a CER strategy in the Elaborate section. These, with various Evaluative options for students to display their mastery of content.
- Materials provide opportunities for students to construct and present developmentally appropriate written and/or verbal arguments that justify explanations to solutions to problems using evidence acquired from learning experiences. For example, in Chapter 14: Genetics, the "STEM Projects: Develop a Simulation of Conservation Genetics" includes student activity where students implement the Engineering Design Process (EDP). During this process, students create models, evaluate, and redesign solutions to the problem. In the final step of the EDP, students present their findings by providing a written summary, mathematical formulas, details on the impact of conservation genetics on a population, limitations of the simulation, and an example of how the simulation can be applied to real-world situations.

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Indicator 5.2

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

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

Meets | Score 4/4

The materials meet the criteria for this indicator. Materials 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 teacher guidance on anticipating student responses and the use of questioning to deepen student thinking. The materials provide teacher responses to possible student answers, including how to build on student thinking. For example, in Chapter 0, The Process of Science, Lesson 1: What is Science?, during the Engage, students claim how the process of science has changed over time. Teacher guidance indicates that students may think that scientists follow a rigid set of steps and suggests that the teacher "inform students that scientists approach and solve problems with imagination, creativity, prior knowledge, and perseverance... methods that all effective problem solvers use". Teachers "challenge students to come up with examples of when they used these methods to solve a problem." In this way, the materials anticipate student responses and provide teacher guidance on how to build on students' thinking.
- Furthermore, the materials support teachers in deepening student thinking through questioning using the SQ3R method. This method uses questioning to support reading comprehension. In Lesson 2 of Chapter 7, the Teaching section, found on page 326 of 1269, has students survey the text regarding energy levels, ionic bonds, and covalent bonds. Students then write at least three questions about the key concepts. Next, students read the text and answer their three questions. Students end the activity by reciting vocabulary terms and reviewing the text for the

meanings. By providing questioning strategies like this, materials support teachers to deepen students' thinking.

- Teacher guidance on anticipating student responses and questioning to deepen student thinking can also be found in each chapter's "Critical Thinking" section. For example, in Chapter 14: Genetics, in Lesson 2: Basic Patterns of Inheritance, the Explain section includes a Critical Thinking question, "Why does the occurrence of certain genetic conditions vary among ethnic groups?". The material provides a possible student answer, "Ethnic groups have historically formed distinct populations, often separated by geography. A higher prevalence of disease alleles among our distant ancestors may be maintained in current populations. As populations blend over generations, however, occurrence statistics change". This question provides teacher support by listing possible student answers to the question to help support further student learning.
- Additionally, the materials provide teacher guidance to possible student responses within the elaborate phase of each lesson. For example, in Lesson 1 of Chapter 25, in the Elaborate section, there is an activity titled "CER: Levels of Organization and Homeostasis." This activity provides students with the driving question, "How does your body maintain homeostasis?" Students are prompted to make their initial claims using the CER strategy, then return to the activity to record their evidence, revise their claims, and explain their reasoning using the knowledge they have accumulated throughout the chapter. The material lists acceptable student responses, including "At different levels of organization, your body monitors substances, like glucose and hormones, and measurements, like body temperature and blood pressure. In response to changes, your body will adjust and act, possibly through negative feedback, to return to normal limits and maintain homeostasis" to guide instructors.

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

- he materials provide embedded guidance for the teacher on scaffolding students' development of scientific vocabulary related to concepts being taught by implementing the 5E lesson planning model. Materials first introduce concepts through the Engage section, then allow students to gain further knowledge in the Explore section. Students then learn details in the Explain section. Students deepen their understanding in the Elaborate section. Their learning is then assessed in the Evaluate section. For example, in Chapter 8, Lesson 1, students first engage in a video on cell discovery and theory, then explore an activity where they investigate different types of cells. Students solidify their knowledge and explain what they know in various writing assignments and critical thinking activities. Students then elaborate on their understanding through a CER activity and microscope activity. Finally, learning is evaluated via exit tickets. This lesson design embeds supportive scaffolding into students' scientific vocabulary development in the material context.
- More specifically, teacher guidance on scaffolding students' development of scientific vocabulary related to concepts being taught can be seen in each lesson's Engage portion. For example, in Chapter 2: Principles of Ecology, within Lesson 2: Interactions in the Biosphere, during the Explain phase of the lesson, students brainstorm the meaning of each vocabulary term introduced in the lesson. Students generate analogies for words such as habitat and niche. The teacher guidance suggests asking questions to help develop students' conceptual understanding, e.g., what is the difference between niche and habitat? The teacher illustrates vocabulary in context, showing pictures and asking relevant questions. For example, the teacher shows a fallen log with a fungus on it and asks students to explain the habitat and niche of the

fungus. In this way, the materials guide teachers in using analogies and examples to scaffold students' vocabulary development in context.

- Furthermore, the Explore section of each chapter allows students to practice using new vocabulary. For example, in Chapter 15: Genetic Technology, within Lesson 1: DNA Technology, the Explore section provides teacher guidance to have students "practice vocabulary" using the interactive Word Lab and a Reading Strategy where students preview the vocabulary recording terms and ideas. Additionally, the materials provide scaffolded support by providing a list of vocabulary words and pronouncing each word for struggling students.
- Additionally, the materials guide the teacher in supporting students' use of scientific vocabulary in context. For example, in Chapter 24: Animal Diversity and Behavior, Lesson 1: Invertebrates have the key vocabulary words as clickable links in the student ebook that provides a definition when clicked on, that can be translated into English or Spanish.

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. This is evident in the team-building activities the materials offer for students to practice listening to each other and then building off one another's ideas in a group discussion. For example, in Chapter 0, The Process of Science, Lesson 4: Science and Engineering Practices, students engage in argument from evidence during the Explain. Teachers "tell students that scientific argument does not involve personal attacks ... scientists and engineers evaluate each other's results by reviewing their findings (peer review) and debating at technical and professional conferences." Before the debate, the materials suggest the teacher identify student roles and rules, such as time limits, to present arguments and counterarguments. This helps students prepare for discourse.
- The materials also provide teacher questions for supporting student discourse and using evidence in constructing written and verbal claims. Materials frequently provide CER activities that provide the teacher with questions to guide students' claims. For example, in Chapter 9, Lesson 2, the Engage section of the lesson includes a CER activity where students make a claim about how chemical reactions sustain life. Materials provide teachers with the guiding question, "What role do exergonic and endergonic reactions and ATP play in providing energy to cells?".
- Furthermore, the materials provide additional teacher guidance by implementing an extension to the CER activity. For example, in Chapter 15: Genetic Technology, in Lesson 2: Use of DNA Technology in Medicine, the Elaborate section of the lesson includes a Critical Thinking activity that expands on the original CER question. The Critical Thinking prompt directs students to "Explain whether or not you think the test results provide evidence of the genetic cause of the young boy's condition." This activity helps to support the by teacher to encourage student discourse to use evidence to support their ideas.
- The materials provide teacher guidance on how to set up a class culture to support student discourse. In this culture, students listen to and evaluate whether they agree with one another's ideas. Materials offer team-building activities for students to practice listening to each other and then build off one another's ideas in a group discussion. For example, in Chapter 25: Introduction to Human Body Systems, Lesson 2: Overview of Human Body Systems has students study the connection between the skeletal and muscular systems and how they work together to move the human body. The materials have students participate in multiple investigations and activities where students collect and compare data. Students are put into groups and construct a human body systems model.

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

- The materials provide teacher support and guidance to engage students' thinking in various modes of communication throughout the course. For example, in Lesson 3 of Chapter 10, the blueprint (found on pg 490 of 1269) includes a written CER activity, a true or false verbal questioning activity, and an activity where students model cellular respiration. More specifically, in Chapter 3: Biomes, Ecosystems, and Communities, in Lesson 3: Biological Communities, during the Engage, students use a "Claims Evidence Reasoning (CER) strategy to answer the essential question, What is ecological succession and how do human activities and climate change impact it?". In the Elaborate phase of the lesson, students revise their claims. The teacher guidance reminds teachers to help students record evidence, revise claims and explain reasoning. Another CER example can be found in the evaluate section of Chapter 21, where teachers are guided to have students "Name the three groups into which protists are classified and a defining characteristic of each group." An example student response is included in the curriculum documents: "Animal-like protists consume other organisms; most plantlike protists undergo photosynthesis; funguslike protists feed on decaying organic matter." This teacher guidance engages students in various modes of communication.
- Teacher guidance for how students can share their thinking and finding solutions can be seen in "Quick Labs." For example, in Chapter 17, in Lesson 1, the Quick Lab "Correlated Rock Layers" include teacher guidance to have students conduct a lab that groups students to determine the relative age of fossils in rock layers. The material provides teacher support for facilitating the lab while students make scientific drawings showing the cross-section of the layers and labeling. Students work together to answer questions and further explain the process of analyzing and suggestions for improving analyzing the rock layers.

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Indicator 6.1

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

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- Materials include a range of diagnostic assessment opportunities to assess student learning in various formats. The Engage phase of each lesson within the chapters includes pre-assessment. For example, in Chapter 2: Principles of Ecology, Lesson 1: Ecology and Earth's Systems, during the Engage phase of the lesson, students "brainstorm what kinds of organisms might live in a coral reef system, and how they might interact with each other" and nonliving parts of the ecosystem. Teachers use students' responses to gauge their understanding of how living things interact and identify any preconceptions they might have. Teachers can use this diagnostic assessment to assess students' prior knowledge of the principles of ecology.
- Materials include formative assessments in various formats that help measure student learning and determine the next steps for instruction. The Lab Library: Biology document includes many lab investigations that allow teachers to assess students as they form their knowledge. For example, in the "Quick Lab: Investigate Enzymatic Browning" activity, students explore the effects of heat, acidity, and reactant concentration on the phenolase enzyme. Teachers can use students' post-lab analysis as a formative assessment to gauge student understanding of environmental effects on enzymes. The materials contain another example of a formative assessment in Chapter 21: Protists and Fungi, Lesson 1: Introduction to Protists. This lesson

includes an exit ticket asking students to “Describe evidence that protists share a common ancestry.” The material provides the teacher with student exemplar answers, “New mitochondria and chloroplasts form by binary fission; the proteins created by these organelles share similarities with proteins produced in bacteria.” to assess students’ knowledge throughout the lesson.

- The material includes a range of summative assessments that include opportunities to assess student learning in various formats. For example, in Chapter 15: Genetic Technology, teachers can access the material’s Summative Assessments under Resources. Chapter 15, for example, includes a Chapter Test. The materials state that this resource is a “premade-online assessment for Chapter 15: Genetic Technology. Assign to assess understanding of TEKS and chapter content.” Materials include another example of a summative assessment in Chapter 21. This chapter includes a “Fungus Diversity Lesson Quiz in” Lesson 3. The materials state that this quiz is a "...digital summative assessment [which] evaluates student understanding of fungi diversity.”

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 student expectations and indicate which student expectations are assessed. The materials include detailed TEKS-based lesson plans, which outline how teachers can use the materials to teach specific concepts and skills and address particular students’ expectations, and guidance on assessing student learning. Lessons within each Chapter begins with a TEKS Progression, an Unpack the TEKS section, and a Lesson Blueprint. These three items provide an overview of the 5E lesson plan and outline how teachers can use the materials to teach the concept and assess student learning. For example, Chapter 2: Principles of Ecology, Lesson 3: Flow of Energy in Ecosystem, addresses the following TEKS: “13.B Analyze how ecosystem stability is affected by disruptions to the flow of energy through trophic levels using models.” The lesson plan provides opportunities to explore and read about ecosystem energy flow and assesses the concept during the Evaluate section. Students compare and contrast the three models discussed in the lesson: food chains, food webs, and ecological pyramids. In this way, the materials indicate student expectations, provide lesson plans that support students’ learning, and assess students’ learning.
- Teachers can find other examples of Lesson Blueprints in Chapters 14 and 26. For instance, in Chapter 14: Genetics, the blueprint includes a Customizable Lesson Plan with pacing suggestions and references TEKS 8.B and the activities assessing students’ expectations for the lesson. While in Chapter 26: Human Body Systems Part 1, Lesson 1, Lesson 1 Blueprint includes two suggested Customizable Lesson Options aligned to TEKS B.12.A and have options for the Engage, Explore, Explain, Elaborate, and Evaluate.
- The materials also include a TEKS-aligned assessment in each chapter aligned with the curriculum standards and student expectations of that chapter. The authors designed these assessments to measure student understanding and mastery of the concepts and skills taught in the materials. For example, in Chapter 26, the TEKS-aligned assessment includes questions that cover TEKS 12.A while in Chapter 14, the assessment is aligned to TEKS 8.B.
- Furthermore, the “Lab Library: Biology” includes investigations intended to be formative assessments. Each lab contains a list of the TEKS it covers. For example, “Launch Lab: How is Energy Transformed” lists the following TEKS: K&S 1.B, K&S 1.C, K&S 1.D, K&S 1.E, K&S 1.F, K&S 3.A, K&S 4.A, K&S 11.A. These lab materials assess all student expectations and successfully indicate the assessed expectations.

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

- The materials include assessments requiring students to integrate scientific knowledge and science and engineering practices appropriate to the student's expectations. For example, in Chapter 5: Biodiversity and Threats, Lesson 3: Climate and Climate Change requires students to use their knowledge of threats to biodiversity to revise their initial claims in response to the essential question: “How do natural changes and human activities affect Earth’sEarth’s climate?” Students use a Claims, Evidence, Reasoning (CER) format. This assessment requires that students engage in the SEP of developing explanations supported by data. The teacher’s guidance recommends students use recorded evidence to revise their claims. Thus, this CER assessment requires students to integrate scientific knowledge and science practices.
- The materials include assessments that require students to integrate scientific knowledge and science and engineering practices by implementing multiple laboratory investigations throughout each lesson. Each lesson includes various formats of labs, including introductory “Launch Labs,” simple, “Quick Labs,” and in-depth “Bio Labs.” These labs integrate different science and engineering practices with scientific knowledge from the lesson. For example, “Quick Lab: Relate Photosynthesis to Cellular Respiration” integrates TEKS K&S 1.B, K&S 1.C, K&S 1.D, K&S 1.E, K&S 1.F, K&S 3.A, K&S 4.A, K&S 11.A by having students use aquatic plants submerged in an aqueous bromothymol-blue solution to gauge how plants utilize CO2 from students' cellular respiration to produce oxygen via photosynthesis. Also, in Chapter 19: Origin and History of Life, within Lesson 3, the “BioLab: Does this animal walk on four legs or two?” can be found. In this lab, students investigate and explore utilizing SEPs to “Devise a plan to compare the limbs and pelvis of a gorilla, australopithecine, and present-day human.” The materials will assess the student's mastery of TEKS 4.A and include the use of the SEPs 1.A (ask questions), 1.B (apply scientific practices to plan and conduct descriptive, comparative, and experimental investigations), and 1.E (collect quantitative and qualitative data).
- Another example of how the materials include assessments that require students to integrate scientific knowledge and science and engineering practices is in Chapter 26: Human Body Systems Part 1. In Lesson 1 of this chapter, under the Elaborate section, the materials have ."..students work with a partner to design a model of the integumentary system. Students should understand that defining the system is critical to building models. Before they begin models, have them answer questions such as: What are the key parts of the integumentary system? How do the parts of the system work together?." This passage shows that students will be utilizing the content of TEKS 12.A (over human body systems) along with SEP 1.A (where students ask questions and define problems based on observations of models), 1.D (where students use appropriate tools such as models), and 1.G (where students develop and use models).

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 novel contexts, i.e., a new phenomenon or problem. For example, Chapter 5: Biodiversity and Threats include a STEM project where students apply their developing knowledge of threats to biodiversity to "design a solution to reduce the impact of flooding for a coastal city where it is predicted that climate change will affect the amount of flooding that occurs."
- The materials include assessments in lab activities that require students to apply knowledge and skills to a new phenomenon or problem. For example, the "BioLab: Does sunlight affect the cell cycle in yeast?" activity investigates the effect of ultraviolet radiation on the cell cycle. Students

use content knowledge regarding DNA damage and cell cycle checkpoints and apply their learning to understand if sunlight alters the cell cycle of yeast.

- The material also includes assessments in the form of student explanations. These explanations require students to apply knowledge and skills to novel contexts. For example, in Student eBook, in lesson 1 of Chapter 19: Origin and History of Life, students are asked to "explain how Miller and Urey's experiment supported the primordial soup hypothesis" to assess their mastery of applying knowledge and skills to respond to the prompt.
- The materials include assessments that require students to apply knowledge and skills to a new phenomenon or problem. Teachers can find these assessments in Chapter 26: Human Body Systems Part 1, Lesson 1, Explore Activity, where teachers "Obtain a tennis or other object that can be picked up using one hand. Have a student try to pick up the ball without bending any of the joints in their hand; next, students try to pick up a ball without using a hinge joint. Finally, have a student try to pick up a ball without using a ball and socket joint." students then revisit the driving questions "How does the interaction between skeletal muscles and the skeleton help you when you work out?"

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Indicator 6.2

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

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

Meets | Score 2/2

Materials meet the criteria of this indicator. Materials include guidance that explains how to analyze and respond to data from assessment tools.

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

Evidence includes but is not limited to:

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

- Materials include information that guides teachers in evaluating student responses, as evidenced by the TEKS Assessment Guides and the rubrics provided with assessments. The TEKS Assessment Guides correspond to chapter assessments and provide rationales for question responses, including incorrect answers. For example, the TEKS Assessment Guide: Chapter 14, which can be found by accessing the Biology: Program assessments within the Table of Contents, contains a multiple-choice question about an experiment performed by Gregor Mendel. The question asks students why Mendel removed the anthers from the pea flowers he was using. The document explains why three choices are incorrect and justifies the correct answer "because Mendel wanted to ensure cross-breeding, not self-pollination." The information in these rationales guides teachers in evaluating student understanding. Chapter 19: Origin and History of Life contains another example in Lesson 1: Origin of Life. Teachers can find a "Writing Extensions" activity in this lesson's resources. This activity includes an assignment, "Applying Practices: Scientific Explanations of Cellular Complexity," and a rubric. The materials provide a rubric for teacher guidance for evaluating student responses scoring between 0, 5, 10, or 15 points.
- Though these two examples provide evidence for information and resources that guide evaluating student responses to chapter assessments, in Chapter 2: Biomes, Ecosystems, and

Communities, within Chapter3: Biological Communities, the Evaluate section instructs students to explain why secondary succession may occur faster than primary succession, and provide a sample answer with a note that “student responses may vary”. Materials include a resource called "Assessment Administration Guide" that includes information about what assessment is, opportunities within the program, support in making instructional decisions, guidance for evaluating student responses, and teacher guidance on how to analyze and respond to data.. Furthermore, the materials provide assessment building tools, andTEKS assessment guides, and rubrics for the tests. The materials provide an Assessment Generator that offers self grading, with the opportunity to provide feedback to students through the platform. Additionally, the materials include rubrics that guide teachers in giving feedback to students via a 1 to 3 scoring scale, with detailed components to guide the teachers evaluation of 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 support teachers’ analysis of student assessment data from chapter assessments. The TEKS Assessment Guides correspond to chapter assessments and provide rationales for question responses, including incorrect answers. For example, Chapter 14 includes a TEKS Assessment Guide in the Table of Contents under Biology: Program Assessments and a rubric for question two. This rubric uses a three-point scoring system (0-1-2) and provides descriptions and sample responses for each score (ex., the response “Three-fourths of the baby mice would have gray fur” would earn a “1”). These TEKS Assessment Guides also provide rationales for answer choices within multiple choice questions. These rationales justify correct answers and provide guidance for understanding why a student may have chosen an incorrect answer. By providing such rubrics, materials guide teachers’ responses to an analysis of student data based on student needs.
- The materials also include online assessments, which 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. For example, in Lesson 1 of Chapter 19: Origin and History of Life, the Resources include an Assessment titled Lesson Quiz: Lesson 19.1, which is an “online assessment for Lesson 19.1 Origin of Life." The online assessment provides teacher guidance for evaluating student responses by auto-grading and explaining answers.

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

- The assessment tool yields relevant information for teachers when planning instruction, intervention, and extension. For example, a Texas Biology Interactive Performance Report in the Main Menu under Reports includes reports on student activity performance and standard performance. These reports help guide teachers' assessment data analysis and help teachers respond to students' needs. For example, online assessments provide Activity Performance which includes relevant information such as: overall class average, student distribution, date range, and average score. The online assessments also provide Student Activity Performance data, which provides information for each individual student and Class Item Analysis Activity Performance Data which provide information on how students did on each item, each standard,

and percentage of correct submission. All this data provides instructors with the information need to plan instruction, intervention, and extension.

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

- Materials provide various student resources for teachers to respond to performance data. For example, each chapter includes Word Lab and Science Literacy Essentials, which support students in developing vocabulary. In response to assessment data, teachers can "use Word Lab and Science Literacy Essentials for individual or small group work to provide repeated exposure to content vocabulary" for struggling students. Each of these provides a variety of student resources. For example, in Chapter 8, in the Science Language and Content Acquisition, the Word Lab "provides visuals, definitions, and examples for vocabulary, as well as activities involving word origins, affixes, multiple-meaning words, and words in context." The materials content another example in Chapter 18: Speciation and Extinction, in Lesson 1: Speciation, under the Lesson Wrap Up, which includes resources such as WORD LAB and Science Literacy Essentials that teachers can use for remediation after reviewing summative assessment data from the Lesson Quiz.

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Indicator 6.3

Assessments are clear and easy to understand.

1	Assessments contain items that are scientifically accurate, avoid bias, and are free from errors.	M
2	Assessment tools use clear pictures and graphics that are developmentally appropriate.	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.

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

Evidence includes but is not limited to:

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

- Assessments contain items that are scientifically accurate. Both formal and informal assessments include items that align with taught objectives in a scientifically accurate way. For example, in Chapter 10: Photosynthesis and Cellular Respiration, within the Lesson Wrap Up of Lesson 1: Life Depends on Photosynthesis, students revisit the lesson's essential question, "Why is chlorophyll important for photosynthesis?" as an informal assessment. Materials contain another example at the end of Chapter 2: Principles of Ecology, in Lesson 3: Flow of Energy in Ecosystems, where students recall the primary characteristic of an autotroph. The answer key indicates, "Autotrophs are able to change energy into a form of energy that can be used by other organisms." This sample answer is a scientifically accurate response. Furthermore, in Chapter 25: Introduction to Human Body Systems, Lesson 1 Teaching contains exit tickets to assess student learning. An example of an exit ticket to assess students over the Topic: Levels of Organization is "Describe how the human body is organized by levels."
- The materials also contain assessments that avoid bias and are free from errors. For example, in Chapter 14: Genetics, the Chapter 14 Test includes the test question, "A geneticist crossed fruit flies to determine whether two traits are linked. The geneticists crossed a fly with blistery wings and spineless bristles (bbss) with a heterozygous fly that had normal wings and normal bristles (BbSs). Which results in the next generation would suggest these traits are linked?" The materials provide the answer "D) 222 normal wings, normal bristles, 27 normal wings, spineless bristles, 22 blistery wings, normal bristles, 228 blistery wings, spineless bristles," demonstrating that the question is scientifically accurate, non-bias, and free from errors.

- Formative and summative assessments also include items that present content and examples fairly and impartially with no impact on student performance based on such factors as a student's home language, place of origin, gender, or race and ethnicity. Examples and embedded assessment items in Chapter 3: Biomes, Ecosystems, and Communities, Lesson 1: Biomes and Ecosystems: Terrestrial utilize examples of diverse terrestrial paces, such as Big Bend National Park, The Texas Hill Country, Rio Grande City, Texas, tropical savanna and the tundra, and provide background information for students who may not have visited that particular ecosystem.

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

- Assessment tools use clear pictures and graphics. For example, in Lesson 1 of Chapter 3: Biomes, Ecosystems, and Communities, the embedded formative assessment, "Look Closer," allows students to view clear temperature and precipitation graphs from Reno, Nevada, and New Guinea and then "Identify which climate has the most variation in temperature and which has the most variation in precipitation." Also, materials try to promote visual literacy amongst students through graphics. Materials include graphics in the Visual Literacy activity in Lesson 2 of Chapter 8, where authors assess students' understanding of the plasma membrane by investigating an image of a phospholipid bilayer. The authors clearly depict the bilayer with a color code, accurate labels, and a key that identifies the phospholipid head and tail without errors.
- Assessments contain pictures and graphics that are developmentally appropriate. Materials include pictures and graphics of body systems that are developmentally appropriate with enough detail to learn science content but without excessive detail that would alarm or overwhelm high school students. For example, in Chapter 5, Biodiversity and Threats, Lesson 3: Climate and Climate Change, when studying deforestation, Figure 31 is an aerial image of deforestation in the Amazon depicts the result of deforestation in a way that is clear, but not so detailed as to show close-up impacts on humans and other organisms that might overwhelm high school students experiencing climate anxiety.

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

- Materials provide clear guidance for teachers to consistently and accurately administer assessment tools. Materials include an assessment guide in the form of an interactive video. The assessment guide explains how to use premade and custom assessments and generate and use the various reporting tools in the materials.
- Materials also provide clear guidance for teachers to consistently and accurately administer claim-evidence-reasoning assessments by providing a detailed instruction page that also serves as a template for students who may need it. The document explains each component of the CER format and provides space for student answers. For example, the document describes a claim and how to create one: "A scientific claim answers a question or offers a solution to a problem. Reflect on the Chapter Driving Question and brainstorm potential answers. Use your observations from activities in the lessons in the chapter to formulate your claim about the question."
- Additionally, provided guidance is evident in Chapter 14: Genetics, under the Resources section, which includes a TEKS Assessment Guide that offers teachers answer keys and explanations for

why students select specific incorrect answers. The TEKS Assessment Guide provides detailed information to guide the teacher on scoring procedures, such as a rubric for scoring constructed response questions. Furthermore, the material guides ensure consistent and accurate administration of assessment tools. For example, in Chapter 17: Evidence of Evolution, within the Chapter Digital Resources, the available assessments for the entire chapter are included and organized by lesson. In the first section, the chapter overview lists the Chapter Pre-Test, Science Probe, Chapter Review, Vocabulary Test, and Chapter Test as assessments. Each lesson is then provided with assessments to include Exit Tickets and Lesson Quizzes.

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

- Materials include guidance regarding accommodations for assessment tools to allow students to demonstrate mastery of knowledge and skills aligned with learning goals. The materials include a guide called "Supporting All Learners," which provides teacher guidance for implementing accommodations. The guide offers many recommendations for accommodating students during instruction and assessments. For example, for students with hearing and visual difficulties, the guide recommends to "allow students to work in an area of the classroom that is free of distractions." The guide recommends "having students restate the instruction back in their own words for students with memory and cognitive difficulties." By providing such guidance, materials allow students to demonstrate mastery through various assessment tools.
- Materials also include guidance regarding accommodations for assessment tools such as scaffolded questions and sentence stems for Emergent Bilingual students. For example, materials provide scaffolded activities in Lesson 3 of Chapter 7, where students respond to statements to assess their understanding. Begging students are provided simple phrases like "Am I right?" and "Is this right?."" In contrast, intermediate students receive stems including, "I think you mean ____." to assist them in answering the statements. The materials also provide ELPS accommodations. For example, Chapter 25: Introduction to Human Body Systems, Lesson 2 Teaching, Explain Topic: Interactions Among Systems includes guidance for ELPS Beginning, Intermediate, and Advanced/Advanced High.
- The materials include guidance to offer accommodations for assessment tools that allow students to demonstrate mastery of knowledge and skills aligned with learning goals. For example, in Chapter 18: Speciation and Extinction, the materials provide assessment tools for students with accommodations, including text-to-speech, highlighter, calculator, notepad, and line reader built into the assessments.

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Indicator 7.1

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

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

Meets | Score 2/2

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

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

- Materials provide recommended targeted activities to scaffold learning for students who have not yet achieved mastery. These activities are evident in each "Lesson Teaching" section, where materials provide an activity for all students and recommend scaffolds for students at different English proficiency levels. For example, in Chapter 12: Cell Cycle, Lesson 3 Teaching, the Explain section provides an activity where students share and discuss notes they've written in class. For students at the "Beginning" level of proficiency, materials recommend that teachers read their text aloud, add gestures and other visual aids, and write the main ideas on the board for students to copy into their notes. For students at the "Intermediate" level of proficiency, materials recommend writing simple sentences on the board and asking students questions about those sentences. For "Advanced" students, materials suggest teachers prompt students to write summaries in their notebooks, then discuss them with peers. Activities such as this provide scaffolds to students who have not yet achieved mastery, allowing all students to achieve the same learning goals.
- Another example is Chapter 3: Biomes, Communities, and Ecosystems, within the Chapter Planning and Support. This support provides resources to differentiate before the assessment, "If students need support before testing, assign LearnSmart of Science Literacy Essentials for differentiated learning." This recommendation targets instruction for students who have not yet achieved mastery.
- Furthermore, in Chapter 16: Evolutionary Change, Lesson 1: The Development of the Theory of Evolution, Teaching Lesson 1 with 5E Options, the Engage section has instructions to "Activate Prior Knowledge," which provides the teacher with guidance, labeled "REINFORCE," to establish

a scaffold for students. In this example, students discuss the question, "What biological discoveries have you learned about helped scientists understand DNA, genes, and inheritance?". The material supports the teacher by providing possible student answers and guiding questions for the teacher to ask to expand upon the previous question. The inquiries help the teacher to establish a firm foundation to introduce the lesson on natural selection and evolution.

- The materials also include recommendations for downward scaffolds. Recommended scaffolds vary depending on the area of focus but include reinforcement of reading, scanning, and annotating skills. Materials provide these scaffolds in Chapter 24: Animal Diversity and Behavior, Lesson 1 Teaching, Topic: Invertebrate Characteristics, Reading Strategies, where the teacher guidance states, "Say to students: Before you read this lesson, Survey the lesson and make a list of headings. Write a list of Questions related to the key headings. Next, Read the lesson, Recite vocabulary, and Review the meanings of the words."

Materials provide enrichment activities for all levels of learners.

- Materials provide enrichment activities for all levels of learners. Teacher guidance and additional resources encourage student exploration and application of course-level science knowledge and skills in various ways, including applying new learning to project-based explorations. Each unit includes a list of suggested readings and activities to encourage all students to make connections, learn about the unit concept and standards, and integrate mathematical and reading practice where applicable. The materials contain these lists can in the Chapter Digital Resources. For example, in Chapter 25: Introduction to Human Body Systems, the Chapter Digital Resources include videos on Negative Feedback and Interactions Among Systems, Interactive Case Explorations: Human Body Systems, and Interactive Visual Literacy: Levels of Organization and Respiratory System.
- Another way the materials provide enrichment is evident in the multiple supports offered to learners with varying levels of English language proficiency. For example, in Chapter 1: Introduction to Biology, Lesson 1: What is biology?, during the Explain portion, teacher materials provide recommendations for beginning, intermediate, and advanced learners. Recommendations for supporting beginning learners include showing pictures of living and non-living things and asking learners to point to examples of each; recommendations for supporting advanced learners include asking learners to provide definitions and examples of living and non-living things. In this way, the materials offer instructions for enriching all learners' understanding of living and non-living things.
- Furthermore, the materials enrich the various activities provided in the Explain section of each chapter. For example, in Chapter 20: Bacteria, Archaea, and Viruses, in the Explain section of Lesson 2: Bacteria and Archaea, the teacher is provided with multiple student activities to expand upon the concepts, including a Math Connection where students calculate the number of bacteria cells after three days given a specific rate, Creative Writing or Create a Comic Strip about a process, Interactive Visual Literacy which students learn about the survival of bacteria, and students working in pairs to describe how matter and energy flow through the ecosystem.
- Materials also provide extensions for students who have already met mastery. The "Extend" activities increase students' learning by enriching their knowledge and understanding. For example, Chapter 7: Chemistry of Life, Lesson 4 Teaching, in the Explain section, provides a "Critical Thinking" activity where students form small groups to discuss the relationship between carbon's atomic structure and the molecules it can form. This activity deepens students' understanding of the relationship between structure and function.

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

- Materials provide scaffolds and guidance for just-in-time learning acceleration for all students by providing resources for teachers to identify and respond to students' misconceptions, accelerate students' learning, and support struggling students.
- Materials provide resources that assist teachers in responding to students' misconceptions in the Engage section of Chapter 4: Population Ecology, Lesson 1: Population Dynamics, where teachers ask students to share what they think of when they hear the word microbe. Materials indicate students may have a negative connotation about microbes and suggest the teacher explain, "some microbes are pathogens, meaning they cause disease. However, not all microbes are pathogens." Materials guide just-in-time learning acceleration by identifying and addressing prior misconceptions just before learning.
- The materials also provide lessons with support and resources for students who are ready to accelerate their learning. The "Program Overview" details various interactive student activities that teachers can assign based on students' content mastery. For example, teachers can direct students who are ready for their learning to move forward to a "Science in Action" article, a virtual lab, or a "Science Bob" video. Students who need scaffolded support can receive an "Interactive Visual Literacy" video, a "LearnSmart" remediation activity, or a TEKS Refresh assignment. Teachers can utilize these scaffolds and guidance provided in the Program Overview as just-in-time learning acceleration for all students.
- Materials also provide scaffolds and guidance for teachers when their students struggle with the material. For example, in Chapter 14: Genetics, Lesson 1: Mendelian Genetics in Teaching Lesson 1 with 5E Options, the Explain section includes a reading strategy to help reinforce the lesson's content. The material provides questions for students to discuss and guided support for teachers to assist students struggling with developing the answers. In the following example, students read about hybrid crosses; the question for students to consider is, "Why are some new cars called hybrids?" the guided response for the teacher to help support the student is, "They have two different motors: one powered by gasoline and the other by electricity." This approach allows the teacher to offer immediate guidance to a struggling student. The materials also provide the teacher with probing questions to assist in re-engaging students when they are struggling with a task without lowering the cognitive demand. The materials include probing questions in Chapter 25: Introduction to Human Systems, Lesson 2: Teaching, Engage Activity: Nervous System, where materials guide teachers to ask students the following questions: "Was there a difference in where the ruler was caught between different people? Was there a difference in how quickly the ruler was caught when you knew it was being dropped? Was there a difference in how quickly the ruler was caught after it was dropped several times?"

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Indicator 7.2

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

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- Materials include a variety of developmentally appropriate instructional approaches to engage students in the mastery of the content. This is evident in the organization of the chapters through lesson blueprints, differentiated resources, and classroom demonstrations.
- First, each chapter is vertically aligned such that the content of one chapter builds on either students' prior knowledge learned in middle school and/or previous chapters. It prepares them for future learning within the course and beyond. For example, in Chapter 3: Biomes, Ecosystems and Communities, Lesson 1: Biomes and Ecosystems: Terrestrial, the TEKS progression identifies Grade 6 and Grade 7 TEKS 6.12 A and 7.9C as prior knowledge for learning HS TEKS 13.D addressed within the chapter. This section builds on previous learning about biotic and abiotic factors and prepares students to learn how environmental changes affect biodiversity, including environmental changes that humans cause. This alignment exemplifies how the materials include developmentally appropriate instructional strategies to engage students in mastery.

- Furthermore, the materials provide developmentally appropriate instructional approaches through lesson blueprints. These blueprints are formatted in the 5E instructional model and include a variety of instructional approaches that teachers can choose from to engage students best. For example, in Chapter 14: Genetics, Lesson 3: Blueprint (pg 684 of 1269) provides seven different "Explore" activities, including a model-building activity that can be done individually, in partners, or groups; a group lab activity; an individual reading activity; a color blindness test activity that can be completed in a whole class setting, in groups or partners, or individually; and two virtual labs that students can complete in groups, partners, or individually. These activities illustrate a variety of developmentally appropriate approaches for content delivery to engage students and lead them to mastery of the content.
- The material supports the teacher by providing a variety of developmentally appropriate instructional approaches through differentiated resources. For example, in Chapter 16: Evolutionary Change, Lesson 1: The Development of the Theory of Evolution, the "Lesson Wrap-Up" includes a section titled "Differentiation Resources" that provides multiple resources to differentiate the content. The resources include a "Word Lab" where students can explore the vocabulary term in more detail with images, flashcards to review the terms, and a practice page for students to demonstrate mastery of the content. The resources also include an "Interactive Visual Literacy" that allows students to review slides of the content, layering of slides, and reinforcement questions. Furthermore, the materials contain a " LearnSmart " resource to offer further differentiated support.
- Materials engage students in the mastery of the content through classroom demonstrations. The materials include one of these demonstrations in Chapter 26: Human Body Systems Part 1, Lesson 1 teaching, Explore: Quick Demo materials direct teachers to "Obtain a long bone, such as a beef femur, from a local grocery store or butcher shop. Have the butcher saw the bone in half lengthwise. Use this bone to illustrate compact bone and spongy bone."

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

- The materials consistently support flexible grouping (e.g., whole group, small group, partners, one-on-one). Materials provide teachers with lessons on core content and concepts in whole group instruction and suggestions for small group or one-on-one practice and activities. Materials label suggestions as "Developing and Using Models," "Apply your knowledge," or "CER." Teachers can find this kind of suggestion in Chapter 27: Human Body Systems Part II, Lesson 1 Teaching, Explain: Developing and Using Models, where materials direct teachers to "Have students work in groups of three to five to design and make a model of a neuron." And in Chapter 1: Introduction to Biology, in Lesson 2: Measurement, students work with a partner to measure their height using a meter and a yardstick placed one meter from the floor. The teacher then engages the whole group in discussing the results, the source of error, and ideas for more accurate measurements.
- Another example of flexible grouping is Chapter 7: Chemistry of Life; in Lesson 2, Chemical Bonds, the Lesson Blueprint provides 13 different "Explain" activities that teachers can implement using different grouping strategies. For example, the writing support activity instructs students to describe how compounds are formed and may be suited for individual students or partners. In contrast, the Visual Literacy activity allows students to investigate a diagram in a partner or small group. By providing various activities, the materials give the teacher flexibility on how students work together to learn the material.
- Furthermore, in Chapter 17: Evidence of Evolution, Lesson 2: Comparative Evidence, the teacher's instructions for the Explain portion of the lesson includes a science and engineering

practice activity of "Obtaining, Evaluating, and Communicating Information," where "students work in groups to research and complete a poster or other presentation on a pair of homologous structures."

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

- Materials consistently support multiple practices (e.g., modeled, guided, collaborative, independent) and provide guidance and structures to achieve effective implementation. This is evident in the lesson blueprint provided in each chapter. The lesson blueprint is formatted in the 5E instructional model and contains a variety of methods for students to practice engaging with and employing content knowledge. For example, in Chapter 19: Origin and History of Life, Lesson 1: Origin of Life, the Blueprint includes multiple types of student practices and structures such as: "Claim Evidence Reasoning," Bio Lab, Recurring Themes: Systems and System Models, Visual Literacy, and science and engineering practices. The material includes activities to guide teachers toward achieving effective content delivery. Additionally, in Chapter 11: DNA Structure and Gene Function, Lesson 1 Teaching provides six different options for "Explore" activities where students practice recognizing and using course concepts, such as the "QuickLab: Model DNA Structure," in which students build models representing the structure of DNA. Another type of practice provided includes a visual literacy activity, where students investigate a diagram of DNA. This variety of activities allows teachers to support the needs of all students by providing multiple types of practice.
- Teachers can find another example where the materials support multiple practices in Chapter 2: Principles of Ecology, Lesson 4: Cycling of Matter, during the Engage. In this section, the teacher displays a fertilizer bag, modeling how to read the contents and discussing the role of those elements in ecology. Students then collaboratively research how human activities affect the carbon cycle. Finally, students independently answer a question about how the carbon and oxygen cycle are related.
- Furthermore, lessons include multiple types of practices through STEM Connections. Materials contain one of these practices in Chapter 24: Animal Diversity and Behavior, Lesson 2 Vertebrates, Teaching with the STEM Connection: The Birdman of India. First, materials direct teachers to "Have students read The Birdman of India, which describes Salim Ali and how he became an ornithologist after being interested in birds as a kid. He wrote two books, Handbook of the Birds of India and Pakistan and The Book of Indian Birds." then, students responded individually to the "Ask Yourself" reading comprehension questions.

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

- Materials represent a diversity of communities in the images of people and places. The materials contain a diversity of communities in readings and pictures. The materials have examples of diversity in Chapter 0: The Process of Science, Lesson 3: Equity in Science; there is an image of Cecilia Payne, Harvard's first female professor. Dr. Payne first proposed the sun was composed mainly of hydrogen; a colleague convinced her to remove the idea from her thesis and later published that the sun was made mainly of hydrogen. Another example is found later in the same chapter and lesson, in Table 2: Notable Scientific Contributions of Women and People of Color, where information about scientists' contributions, including diverse historical contributions, is listed.

- Materials also accurately and respectfully present information about differently-abled people. For example, Chapter 13, Lesson 3: Errors in Meiosis, illustrates a young woman born with Down syndrome, and Chapter 9, Lesson 1: Cells Capture and Use Energy, includes an image of a young woman with a prosthetic leg sprinting in a track competition. Relevant, respectful images such as these accurately represent the diversity of communities.
- Furthermore, Chapter 20: Bacterial, Archaea, and Viruses, includes an image of various foods, including; bread, beans, cheeses, pickles, milk, and yogurt. The image provides a cultural representation of the variety of foods different populations consume. Also, Lesson 1: Domains and Kingdoms / Figure 3 includes a picture of an individual that is over 60 years of age. The material provides some representation of the diversity of communities within the images.

McGraw Hill Texas Biology

Indicator 7.3

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

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- Materials include guidance for linguistic accommodations commensurate with various levels of English language proficiency as defined by the ELPS. The teacher ebook has embedded Emergent Bilingual (EB)/English Learner (EL) support for beginning, intermediate, and advanced English Learners. These supports are in the Science Language and Content Acquisition section that precedes the chapters. For example, in Chapter 2: Principles of Ecology, the materials suggest support for beginning EBs. The materials instruct the teacher to "show pictures of various animals and their environments, naming each animal and environment. Write the word Ecology on the board. Point to the pictures, gesture, and say Ecology is the relationship (point to the arrow) between living things (point to the animals) and their environment (point to pictures of the environment)." This guidance is consistent with linguistic accommodations defined by ELPS 1A, 2E, and 4F.
- Furthermore, each lesson plan includes guidance for accommodating various levels of English language proficiency in a sectional called "ELPS Support." In Chapter 10, Lesson 2, within "Lesson 2 Teaching," there is a section titled "ELPS Support." In this section, the materials instruct teachers to support students by saying, "Encourage [beginning] students to ask questions about the content... have students repeat after you for pronunciation practice." Materials also provide directions for supporting intermediate and advanced students, guiding them to ask higher-level questions.
- There is another example of how the materials include guidance for linguistic accommodations in Chapter 18: Speciation and Extinction, Lesson 1: Speciation, Teaching Lesson 1 with 5E

Options, in the Explain portion of the lesson, under the section titled "ELPS Support." The ELPS Support includes scaffolding for the content that the teacher can utilize to help support students. In this example, the scaffold has students use "non-verbal cues" when struggling. At the Intermediate level, students use speaking strategies such as similar-meaning words or describing details to communicate when they are not sure. In the Advanced/Advanced High level, students use peer collaboration for help with words.

- Lastly, in Chapter 26, the "ELPS Support" section supports beginning-level students by guiding teachers to "Write the word respiration on the board. Take deep breaths in and out, point to your mouth as you do it, and say: Respiration means breathing. Say the word a few times and have students repeat it after you. Each time you say the word, take a deep breath and elicit students to do the same. Confirm understanding by asking students yes/no questions. Use gestures and ask: Does respiration mean breathing? Does respiration come from your eyes? Does respiration come from your mouth?". The materials also suggest that the teacher supports their advanced-level students by instructing them to "Ask students if they know the meaning of respiration. Discuss that respiration means breathing. Ask what parts of the body we use for respiration. Have students read the information about internal and external respiration. Ask students to summarize the difference."
- These examples show how the materials include guidance for linguistic accommodations commensurate with various levels of English language proficiency as defined by the ELPS.

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

- Materials encourage strategic use of students' first language for linguistic, affective, cognitive, and academic development in English. Each chapter includes a section called "Science Language and Content Acquisition," which guides to support various levels of English language proficiency and a list of transferable and non-transferable skills, cognates, and false cognates. For example, in Chapter 2: Principles of Ecology in the "Science Language and Content Acquisition" section for Emergent Bilingual (EB)/English Learners (EL), the Spanish Language Transfer guidance suggests the teacher help students use knowledge of their first language to develop English in context. Examples of English/Spanish cognates such as biosphere/biosfera follow. There is another example in Chapter 14. In this chapter, the "Science Language and Content Acquisition" section for Emergent Bilingual (EB)/ English Learner (EL) identifies the cognates: hibrido, dominante, and pedigri, which are the Spanish words for hybrid, dominant, and pedigree to promote the acquisition of content specific vocabulary required in learning genetic outcomes. Furthermore, in Chapter 26: Human Body Systems Part I, Emergent Bilingual/English Learner Support where the following cognates for the unit are listed "ossification/osificacion, tendon/tendon, trachea/traquea, bronchus/bronquio, esophagus/esofago, pepsin/pepsina" and false cognates "English: kin, Spanish: esquina (en. corner), English: injury (sp. herida), Spanish: injuria (en. insult)".
- The materials also encourage strategic use of students' first language through the teacher's materials. The teacher materials embed information about Spanish language transfer. For example, in Chapter 3: Biomes, Ecosystems, and Communities in the Science Language and Content Acquisition section for Emergent Bilingual (EB)/English Learner (EL), the Spanish Language Transfer guidance suggests the teacher help students use knowledge of their first language to develop English in context. Examples of English/Spanish cognates within the chapter, such as desert/desierto, follow.

- Additionally, the materials include 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. These tips are in Chapter 26: Human Body Systems Part I, Emergent Bilingual/English Learner Support, where the materials provide the teacher guidance on transferable skills "Both Spanish and English have countable nouns (bones/huesos, lungs/pulmones) and uncountable nouns (skin/piel, breathing/respiracion). Uncountable nouns do not take the indefinite article (a/an, un/una)."

McGraw Hill Texas Biology

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.

- The material provides a Program Overview to be shared with students and caregivers about the design of the program. This document describes the structure of the course, the various resources it provides, the structure of the 5E lesson model, and an explanation of how students use recurring themes and concepts to connect learning throughout the program. For example, in Biology: Get Started, one can find the Program Overview, which, in the Student Edition Lesson Model, provides information on how the material utilizes the 5E Lesson Model to present the material. The Program Overview breaks down the 5E Lesson Model to include “Engage - Set the purpose for learning with a scientific phenomenon and essential question to investigate throughout the lesson. Explore - Use interactive content to help students understand the concepts more deeply, so they can answer the Essential Question. Explain - Connect literacy and science through inquiry by providing students with print and interactive resources to conduct research and explain their understanding. Elaborate - Helps students reflect and refine their thinking by revisiting past answers to see how their thinking has changed and explore new options for further refinement of their thinking. Evaluate - Guide students to demonstrate their understanding by answering the essential question.”

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

- Materials provide information to be shared with caregivers for how they can help reinforce student learning and development. Each chapter includes a Letter to Home with information the

teacher can share with their students' caregivers. Each letter details the standards taught and how the adult may support that at home. For example, resources accompanying Chapter 2: Principles of Ecology include a "Letter to Home" that explains to caregivers that the class is exploring principles of ecology, including "ecological relationships and ecosystem stability." Also, in Chapter 14, the Letter to Home describes the TEKS covered in the chapter and recommendations on how students can study.

- The material also includes a "Family Activity." For example, in Chapter 14: Genetics, the Resources provide a Family Activity where caregivers help to reinforce student learning and development. The example includes the following activity, "Have your student find a chromosome map online and use it to show how chromosome maps can be based on separation frequency between genes (sometimes called recombination frequency)." The material also includes translation to share with caregivers in numerous languages.

Materials include information to guide teacher communications with caregivers.

- Materials include teacher guidance for communicating with caregivers by sending letters at the start of each chapter. The Letter to Home consists of an editable template introducing the parent/guardian to the units, TEKS alignment, and appreciation for stakeholder support. The teachers can download the letter, and since the authors intended for teachers to use the letters at the introduction of each chapter, they also set a minimum frequency at which teachers should communicate with parents.
- The material also includes information within lessons to be shared with caregivers and explains how they can help reinforce student learning and development. For example, in Chapter 14: Genetics, in the Resources, a "Letter Home" is provided that describes the content and the TEKS that apply to the chapter. The material includes the ability to translate the letter home into numerous languages.

McGraw Hill Texas Biology

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 and scientific and engineering practices.	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 the knowledge and skills are taught and built in the course materials. Materials provide clear teacher guidance for facilitating student-made connections across core concepts and scientific and engineering practices. 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 are accompanied by a TEKS-aligned scope and sequence outlining the order in which the knowledge and skill are taught and built in the course. This document can be found on the dashboard titled TEKS Correlations: Biology, which includes the page number where each TEKS is listed. Also, at the beginning of each chapter, there is a section titled TEKS at a Glance, which lists the TEKS that align with that chapter. For example, in Chapter 2, Principles of Ecology, TEKS 13A, 13B, and 13C are listed, and in Chapter 7, Chemistry of Life, TEKS 5A and 13.D are listed.

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

- Materials provide teacher guidance for facilitating student-made connections across TEKS. For example, in Chapter 8, Lesson 2, Explore The Plasma Membrane, students create a membrane model. Teacher guidance is included. For example, teachers ask students to include phospholipids and explain how the phospholipid membrane works. The SEP, Developing, and Using Models are identified. In each chapter, there is a Chapter Planning and Support. The section that provides a STEM Project. For example, the STEM Project in Chapter 9, The Energy of Life, tasks students with comparing the rate of cellular respiration in ripening fruits. Students and teachers may refer to the Science and Engineering Practice Handbook for in-depth information on SEPs. The SEP Handbook provides background information on connections of

SEPs to the general content and scientific concepts in the material. The material provides an opportunity for students to make core concept connections in the Chapter Launch of each chapter where teachers facilitate a Chapter Pre-Test.

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

- The material provides review and practice of knowledge and skills spiraled throughout the year to support mastery and retention. This is evidenced in three areas: the student glossary, student lessons, and the scope and sequence:
    - The Student eBook includes a glossary with a search tool where students can see all the units in which a term is referenced. The lessons also include the spiraling of content. For example, searching "genetics" shows its location in four different chapters.
    - Individual student lessons also allow for the spiraling of content. For example, Chapter 2, Lesson 1, addresses TEKS 13.A, which is revisited in Chapter 4, Population Ecology; Chapter 22, Protists and Fungi; and Chapter 22, Intro to Plants. In Chapter 24, Lesson 2, Wrap Up, students revisit the essential questions regarding the essential features of vertebrate phyla. This provides students an opportunity to review the knowledge learned within the lesson. Furthermore, 5E lesson plans begin with an activity that provides spiraled practice. For example, Chapter 24, Lesson 1, begins with a lesson about the presence of vertebral columns that was taught in Chapter 23.
    - The materials provide opportunities for reviewing and practicing grade-level, content-specific knowledge throughout the year and making connections. This is spiraled throughout the year to support mastery and retention. For example, TEKS 5.B on comparing and contrasting prokaryotic and eukaryotic cells is first introduced to students in biology, Chapter 8, Lesson 1. The topic of comparing and contrasting prokaryotic and eukaryotic cells is returned to in biology, Chapter 19, Lesson 1, during the discussion of the development of eukaryotic cells.

McGraw Hill Texas Biology

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 course.	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 course-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. Materials include standards correlations, including cross-content standards, that explain the standards within the context of the course. Materials include a list of all equipment and supplies needed to support instructional activities. Materials include guidance for safety practices, including the course-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 provide teacher guidance and recommendations for use of all materials. For example, in Chapter 0, there is an introduction to each section which explains how to use and/or access a resource. For example, a note to the teacher is included prior to the TEKS progression which informs teachers to review students' previous knowledge about scientific hypothesis, theories, and laws and to guide them as they progress in their scientific knowledge about these ideas. Furthermore, the Chapter Planning and Support section of each chapter shows teachers an overview of the chapter and identifies strategies teachers may use to introduce and close a chapter. McGraw Hill biology also provides individual lesson plan guides to support teachers in planning the instructional strategies to meet student needs. Additionally, the material provides teacher support of all materials and the tools needed to implement them. For example, at the beginning of Chapter 19, Chapter Digital Resources provide guidance to the teacher in selecting the appropriate activity for the student depending on their level of comprehension needs. This allows the teacher to identify which resources will have the greatest impact on the learner. The Chapter Digital Resources are broken down by lesson; for example, Lesson 1 contains activities such as Video, Interactive Visual Literacy, Bio Lab, Claim, Evidence, and Reasoning, Exit Ticket, and Lesson Quiz.

McGraw Hill Texas Biology

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

- The materials include standards correlations that explain the standards within the contexts of the course. For example, the HS Biology Additional Resources contain a TEKS Correlations page. This page identifies the TEKS, the associated curriculum in the student materials, and the page number in the teacher's text. Materials also correlate biology content to cross-content standards, such as ELAR, math, and social studies. For example, in Chapter 14, Genetics, there is a History Connection sidebar about Gregor Mendel that contextualizes the importance of his work. The sidebar explains that Mendel was conducting his research in the mid-1800s, decades before scientists theorized about chromosomes. These cross-curricular correlations are found throughout the student textbook, contextualizing standards in the course. Also, in Chapter 19, Lesson 2, Teaching Lesson 2 with the 5E Options, Elaborate, the section titled Integrate Math provides teachers the opportunity to include cross-content standards in mathematics. For example, on page 839, “Over 1.5 million species have been named and described. Suppose that a mass extinction expected to occur in a hundred years. Ask students: If the mass extinction was an “average” once in which 30 percent of the species survived, how many species would there be after the extinction?”

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

- The materials include a comprehensive list of equipment and supplies needed to support instructional activities. Many labs and activities contain a materials list. For example, in the Dashboard, under Lab and Support Projects, teachers can find the Teacher Support Lab Library, which provides a materials list along with the details of the activities to help support the teacher during instruction.
- In Chapter 1, the Lab Library, “How can you keep cut flowers fresh?” lists all supplies needed to support instructional activity (e.g., flowers, scissors, bleach, balance, pH paper, etc.). The Lab Materials List: Biology can be referenced through the Course Navigation Menu > Biology Lab Support and Projects > Lab Support > Lab Material List: Biology. This resource is provided in Excel format to allow teachers to filter and edit easily.
- In Lesson 2 of Chapter 8 of the Teacher eBook, in the Plasma Membrane activity, teachers are given a list of suggested materials (e.g., packing peanuts of various sizes, colored yarn and paper, etc.) to build a model of a cell membrane. Yet, each chapter includes a STEM Project that connects content material to real world problems, and these projects include a list of supplies. For example, the Chapter 11 STEM Project asks students to “assess pest control options for corn crops.” Materials list can be found in the chapter. STEM Project details (including materials if applicable) are provided outside the Teacher Edition. An example is provided in Chapter 14. You can navigate to this item quickly by using the search tool and typing: STEM Project: Develop a Simulation of Conservation Genetics. In the Generate Concept section, some supplies are suggested. STEM Projects support more open inquiry, and students will be encouraged to choose their own materials when appropriate.

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

- The materials include guidance for safety practices, including the course-appropriate use of safety equipment. This is evident in the Before You Begin section of labs. For example, in Chapter 12, the “Why do cells divide?” lab provides teacher guidance to direct students to wear gloves, lab aprons, goggles, and masks when preparing phenolphthalein solution and agar blocks. This lab also guides teachers to reference the MSDS for precautions when using hydrochloric acid with students. Furthermore, the Lab Library: Biology lists safety icons for each lab. These icons illustrate safety concerns related to the specific lab. For example, in the Chapter 12 BioLab, “Does sunlight affect the cell cycle in yeast?” students should wear an apron and goggles, wash their hands, and be mindful of potential cuts when handling microscope slides. Additionally, on the Dashboard, the Lab Skill and Safety Handbook provides guidance for lab safety equipment and lab safety procedures.

McGraw Hill Texas Biology

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 materials support scheduling considerations and include guidance and recommendations on required time for lessons and activities. This is evident in the Lesson Blueprints, which include both the required time for lessons and activities. Each chapter includes a blueprint. In Chapter 7, Chemistry of Life, the materials suggest 10 minutes for students to explain covalent bonding in a five-sentence paragraph. Also, the Lab Library: Biology resource contains activities that correspond to specific chapters and provide guidance on the required time for each activity. For example, teacher guidance in the Chapter 11 Lab “How is DNA extracted?” recommends 50 minutes for the extraction lab. Furthermore, each chapter contains teacher guidance for the duration of the lesson and how long each component of the lesson takes. For example, in Chapter 25, Introduction to Human Body Systems, the Lesson Blueprint that precedes Lesson 2 contains a listing along with the amount of time each component should take to complete.

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

- The materials guide strategic implementation without disrupting the sequence of content that must be taught in a specific order following a developmental progression. A specific order of instruction can be seen in Chapter 2, Principles of Ecology, where students investigate how "ecological relationships...investigate ecosystem stability" (TEKS 13A) before "analyzing ecosystem stability is affected by disruptions to the cycling of matter and flow of energy through trophic levels using models" (TEKS 13B). The order of chapters builds knowledge sequentially.

For example, Chapter 11, DNA Structure and Gene Function, provides context for Chapter 14, Genetics. Also, chapters are grouped so that interrelated concepts are strategically spiraled back. For example, Chapters 2-6 cover ecology, Chapters 7-13 involve cell biology, and Chapters 14-18 regard inheritance of traits. The material provides sequential prerequisites that inform the teacher of the content the student should already know. For example, in Chapter 24, Animal Diversity, it lists the prerequisite knowledge as being, Classification of Organism, Cladograms, and Ecology. These prerequisites help support the teacher by establishing a method of reviewing previous material and building scaffolding around this prior knowledge.

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

- The materials designated for the course are flexible and can be completed in one school year. Activities and labs are presented with various durations, which provide flexibility and allow completion of the entire scope of the course. The Lab Library: Biology resource contains multiple inquiry activities for each chapter with varying completion times. For example, Chapter 15 has a BioLab titled, “Who did it?” which has a suggested time frame of 50 minutes and a Launch Lab titled, “Why does DNA technology cause ethical debates?” that has a suggested time frame of 30 min. Another example of this flexibility can be found in the Lesson 1 Blueprint of Chapter 23; the Recommended Lesson Plan suggests that if a teacher has students complete all tasks with a green check mark, then the lesson should span 1-2 days. The Blueprint further allows for flexibility because it provides multiple activities for each of the 5Es that the teacher can select from. For example, in the Lesson 2 Blueprint for Chapter 23, teachers can choose from 2 of 5 activities for the Evolution of Animal Body Plans.

McGraw Hill Texas Biology

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.

- Materials include an appropriate amount of white space and a design that supports and does not distract from student learning. The design of the material includes appropriate use of white space around the text that makes the content easy to read and comprehend. Titles and headings are prominent and clear; sections have subheadings, and the margins, edges, and empty spaces are consistent throughout. For example, chapter introductions contain large images with appropriately spaced text, allowing emphasis to be placed on inquiry about phenomena.
- Furthermore, the authors appropriately designed the teacher guidance materials with precise, designated places for important information. The authors designed the Teacher's Guides so that teachers can locate important information quickly for planning and implementation.
- Additionally, the material design supports student learning using a 5E model approach which builds knowledge and skills with progression. The beginning of each lesson provides the teacher with a clear layout of how to apply the 5E model that will support students by using a learning progression approach. For example, in Chapter 14, Lesson 1 includes a Blueprint that provides the instructor with the recommended activities for each of the 5Es.

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

- Materials embed age-appropriate pictures and graphics that support student learning and engagement without being visually distracting. Clear and authentic images that illustrate concepts support the text. For example, images of places and the species that live within those biomes accompany descriptions of biomes. Also, the materials include clear and authentic

images and graphics. These images define and support the new words students learn by providing additional "long definitions." This is in Chapter 21: Protists and Fungi, Lesson 2: Protist Diversity Figure 6 shows a labeled image of a Paramecium that includes a show described and a clickable link for a long description that states, "The cutaway diagram of a paramecium shows the digestive features and other labeled parts: the pellicle; cilia; oral groove; gullet; ectoplasm or the rigid cytoplasm; endoplasm or the fluid cytoplasm; trichocysts; macronucleus; micronucleus; food vacuoles; contractile vacuole and the anal pore."

- While in, in Lesson 1 of Chapter 14: Genetics of the Student eBook, an image of flowers with different colors is included to introduce the lesson on genetics. As the material continues, Figure 2 shows an image of a homologous pair of chromosomes. Also, many pictures have people around the age of high school students, making them more relatable to readers. For example, in Student Textbook, in Lesson 2 of Chapter 9, young adults are pictured practicing "glowga," which "combines yoga with the use of glow sticks."

Materials include digital components that are free of technical errors.

- Materials include digital components that are free of technical errors. Materials are generally free of spelling, grammar, and punctuation errors and inaccurate content materials or information. Materials are also free of wrong answer sheets to problems.
- Furthermore, the digital resources function correctly. For example, all the ancillary resources in the "Biology: Program Resources" section of the virtual course are linked to the correct documents and are successfully viewable.

McGraw Hill Texas Biology

Indicator 9.2

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

1	Materials integrate digital technology and tools that support student learning and engagement.	Yes
2	Materials integrate digital technology in ways that support student engagement with the science and engineering practices and course-specific 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 the science and engineering practices and course-specific 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.

- The materials integrate digital technology and tools that support student learning and engagement. For example, the materials include both a teacher and student online textbook. The online textbook includes tools supporting student learning, including a "search" feature, toggleable teacher notes, and the ability to highlight. The materials also include online assessments within each chapter.
- Furthermore, the materials include digital technology and tools such as Interactive Case Studies, videos, Launch Labs, BioLabs, quick labs, STEM Projects, and CERs to enhance student learning and engagement. For example, Chapter 21: Protists and Fungi, Chapter Digital Resources includes a STEM Project: Compare Protists and Fungi.
- The materials also integrate digital technology and tools through learning games, interactives, simulations, and online assessments. For example, in Chapter 4: Population Ecology, Lesson 1: Population Dynamics, students view a video about how pesticide exposure has affected the population dynamics of bees. While the video is inaccessible, the description and accompanying guidance indicate it supports student learning and engagement. Also, Chapter 0 lists the Digital Resources for the Lesson: Science and Engineering Practices, where students use digital 3D renderings to obtain, evaluate, and communicate information about cell division.

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Materials integrate digital technology in ways that support student engagement with the science and engineering practices and course-specific content.

- Materials provide interactive simulations and models for students to explore scientific and engineering practices in a virtual environment. A list of Chapter Digital Resources precedes the lessons in each chapter. For example, Chapter 0 lists the Digital Resources for Lesson: Science and Engineering Practices. Students use digital 3D renderings to obtain, evaluate, and communicate information about cell division.
- Students also engage with the content digitally through built-in questions where students can type their answers. The built-in questions allow students to use the text as evidence to support the claim and reasoning in their responses. For example, in Chapter 12: Cell Cycle, Lesson 1, DNA replication has an embedded question that asks students, “What is the importance of DNA Replication?” Students can use the “Add Note” tool to input their answers and the “Highlight” tool to highlight their evidence in the lesson. Such functionality allows students to create evidence-based arguments.
- Another way the materials integrate digital technology in ways that support student engagement with the science and engineering practices and course-specific content is within provided STEM Projects. For example, in Chapter 14: Genetics, the “Resources” include a STEM Project: Develop a. Simulation of Conservation Genetics. In this project, students use the Engineering Design Process (EDP) to develop a simulation using computer software, such as “spreadsheets and graphing software.”
- Chapter 16: Evolutionary Change, Lesson 3: Mechanisms of Evolution includes a final example of integrated digital technology in the Engage section of the lesson that has an activity for students to use the PhET simulation to explore natural selection.

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

- The materials integrate digital technology that supports teacher-to-student collaboration. For example, in Chapter 6: Preserving Biodiversity, Lesson 3: Conservation and Biodiversity Preservation contains a section titled “Differentiation Resources,” where the material provides the teacher with guidance to give students access to listed online resources as needed. After students review the provided resources, the materials instruct teachers to ask students if they have questions. This way, the materials integrate digital technology and accompanying teacher guidance to support teacher-to-student collaboration.
- Another way the materials integrate teacher-student collaboration with digital technology is evident in the online textbook by enabling “teacher notes,” where teachers can type notes into students’ textbooks. For example, in Chapter 16: Evolutionary Change, under Resources, the Student eBook includes a tool for teachers to add notes that students can see.
- The material also provides interactive Explore activities students can complete collaboratively in pairs or teams. The curriculum materials encourage collaborations through digital resources such as simulations, virtual labs, and interactive case studies. For example, Chapter 25: Introduction to Human Body Systems, Chapter Digital Resources, demonstrates the variety of digital resource integration. Examples of digital resources include Interactive Case Studies, videos, Launch Labs, BioLabs, quick labs, STEM Projects, and CERs.

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

- Materials integrate digital technology that is compatible with a variety of learning management systems. The Dashboard includes the Program Overview, which has teacher guidance on incorporating the McGraw Hill ConnectED into other platforms, including Blackboard Learn, D2L Brightspace, Canvas, Moodle, Schoology, and Google Classroom.
- The materials are accessible and compatible with SAML 2.0(IDP) or LTI 1.0 and contain a unique identifier stored in the Student Information System (SIS). Examples of directory services, Learning Management Systems (LMS), and Identity Providers we work with include ADFS (Active Directory Federation Services), Microsoft Azure, Google, ID Automation, Hello ID, ClassLink, Schoology, and Canvas for SSO.
- Many digital tools are not accessible for review. Still, the product indicates they are accessible and compatible with multiple operating systems and devices; furthermore, it indicates that the materials are accessible and compatible with Chromebooks, iPads, PCs, Apple computers, and smartphones. The product indicates the materials are accessible online through any device with internet access. The materials are downloadable and accessible without access to the internet.

McGraw Hill Texas Biology

Indicator 9.3

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

1	Digital technology and online components are developmentally appropriate for the course 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 course-appropriate and provide support for learning.

The materials provide digital technology and online components are developmentally appropriate for the course 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 course and align with the scope and approach to science knowledge and skills progression.

- Digital technology and online components align with the course scope and approach to science knowledge and skills progression. For example, digital technology and online components are developmentally appropriate for the course and align with the scope and approach to science knowledge and skills progression. The digital technology and online components are developmentally appropriate for the course. For example, the curriculum materials state that they “are developed based on the TEKS. All digital technology and online components are grade-level appropriate and designed to enhance comprehension of science knowledge and skills.” The authors highlight this alignment in the TEKS Correlations: TEKS, where they list teacher and student materials TEKS correlations for all TEKS. The Table of Contents contains TEKS Correlation under resources.

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

- The materials guide teachers using embedded technology to support and enhance student learning within lessons and assessments. For example, in Chapter 2: Principles of Ecology, in Lesson 2: Interactions in the Biosphere, within the Engage section of the lesson, the materials provide teacher guidance to show students a five-minute video where students will see "examples of community interactions in an ecosystem." The teacher materials guide the video's

placement, purpose, and length to support teachers in successfully integrating the technology within the program.

- Another example of how the materials provide teacher guidance for using the embedded technology to support and enhance student learning is evident through the included chat service called "MH Athena." This service provides automated assistance to help teachers needing technical and sales support or reporting outages. Also, if MH Athena cannot offer assistance, it will connect users to professionals more suited to provide the help needed.
- Furthermore, the materials include a "Help" section that houses instructional documents, videos, and FAQs to guide teachers in the use of the diverse features of the platform, as well as a Tt feature that provides Digital Technical Support for teachers, students & families, and administrators.
- Additionally, the materials provide teacher guidance for using embedded technology to support and enhance student learning in the Program Overview. The Biology: Get Started section in the Dashboard contains the Program Overview. This overview provides teacher support for using embedded technology to support student learning, including LearnSmart, Virtual Career Fairs, Virtual Field Trips, Interactive Word Walls, and Interactive Visual Literacy.

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

- The materials include resources for parents and caregivers supporting student engagement with digital technology and online components. The program overview, which teachers can share with caregivers, outlines the various digital resources included in the materials. For example, the Program Overview describes the Science Bob videos and how they can support student engagement through digital technology.
- Furthermore, the materials provide letters within lessons available to parents and caregivers. For example, in Chapter 14, under Resources, a Letter Home can be found that introduces parents and caregivers to the chapter and the TEKS and provides a family activity to help support the students learning at home.